Matching Economic Migration with Labour Market Needs



OECD

European Commission

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Foreword

The European Commission and the OECD have carried out a joint project over three years on "Matching economic migration with labour market needs". The key questions behind this project are as follows: *What policies and practices are needed to ensure that migration and free movement contribute to meeting the labour market shortages that are expected to arise over the short-to-medium term? How can we make a better use of migrants' skills? What are the lessons learnt from non-European OECD countries, particularly in the management of labour migration?*

Some of these questions, notably those concerning free movement of workers were addressed, in a first publication *Free Movement of Workers and Labour Market Adjustment. Recent Experiences from OECD Countries and the European Union* (OECD, 2012).

Further policy questions are discussed in the present publication, which gathers the papers presented at the "OECD-EU dialogue on mobility and international migration: matching economic migration with labour market needs" (Brussels, 24-25 February 2014), a conference jointly organised by the European Commission and the OECD. This conference brought together more than 150 policy makers, experts, and observers from international organisations, as well as representatives of the social partners.

This publication provides new evidence on the role that international migration has played in Europe and in selected other OECD countries over the past decade in terms of labour force (Chapter 1 by F. Héran and Chapter 2 by J. Gagnon); educational attainment (Chapter 3 by J. Mestres); and occupational changes (Chapter 4 by G. Lemaître). It analyses the availability and use of migrants' skills based on an in-depth literature review (Chapter 5 by A. Damas de Matos); as well as new data analyses for Europe and the United States (Chapter 6 by A. Damas de Matos and T. Liebig), Canada (Chapter 7 by A. Sweetman) and the OECD as a whole, taking advantage of the International Survey of Adult Skills – PIAAC (Chapter 8 by S. Bonfanti and T. Xenogiani). Finally, several chapters discuss the potential role of international migration in meeting current and future labour market needs in Europe (Chapter 9 by the Cedefop), in the United States (Chapter 10 by B. Barnow) and in the European Union (Chapter 11 by G. Lemaître). This work has shown that although migration can make an important contribution to labour force growth, its role in counterbalancing the effects of population ageing will depend on the capacity of countries to match labour needs to migrants' characteristics. In this regard, more needs to be done to better use migrants' skills and to adapt labour migration management systems to employers' needs.

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Executive summary

How can governments ensure that migration and free movement of workers contribute to meeting the labour market shortages that are expected to arise over the next 50 years? How can societies better use the skills of their migrants? What lessons can non-European OECD countries offer Europe, particularly regarding labour migration management? It was to address such questions that the European Commission and the OECD jointly carried out a three-year research project on "Matching economic migration with labour market needs". Its findings are presented in this report.

This publication provides new evidence on the role that international migration has played in Europe and in selected other OECD countries over the past decade in terms of labour force, educational attainment and occupational changes. In addition, it analyses the availability and use of migrants' skills based on an in-depth literature review and new data analyses for Europe and the United States, as well as on Canada and the OECD as a whole, drawing on new datasets, including the OECD International Survey of Adult Skills (PIAAC). It also examines the potential role of international migration in meeting current and future labour market needs in the European Union and the United States.

Although migration can make an important contribution to labour force growth, its role in counterbalancing the effects of population ageing will depend on how well countries are able to match migrants' skills with their labour needs. More needs to be done to better use migrants' skills and to adapt labour migration management systems to employers' needs.

Key findings

The demographics of population, the workforce and international migration

- The labour force is projected to grow on average 4% in the OECD over the period 2010-20, with the educational attainment of both native- and foreign-born individuals in the labour force continuing to increase in the near future, although at lower rates than in the past.
- Observed and future labour and skill shortages are not a simple function of demographic imbalances in the labour force, but depend significantly on the changing nature of demand for particular skills and the extent to which these can be filled from existing sources of supply.
- While migration has an important role to play in counterbalancing the negative effects of population ageing, it cannot be the sole, or even the main, response to address structural demographic, labour market or fiscal challenges.

The availability and use of migrants' skills

- A better understanding of the skills immigrants bring to the host countries and how these are used in the labour markets is crucial for the design of both immigration and integration policy. Selecting and attracting immigrant workers with the necessary skills are emerging as a key policy objective, as is making the best use of the skills of immigrants already in the host countries.
- On average, immigrants have lower educational attainment levels than the native-born. The differences are greater in the United States than in Europe and also for immigrants who have been longer in the country. Immigrants with foreign qualifications have lower returns to tertiary education than the native-born in terms of employment and job quality. There are also large differences in the qualification levels of immigrants and their returns on the labour market depending on their migration category: labour migrants have higher qualifications and better outcomes than humanitarian and family migrants do.
- How the skills of migrants are used in their new countries is fundamental to the successful economic integration of immigrants. The role of diverse economic actors in influencing skill relevance and credential/qualification recognition and the growing understanding that the value of the migrant's education and training in the labour market is conditional on the presence of other skills (in particular, receiving country language ability) are essential for such integration.
- Rising numbers of highly educated across the world, combined with wide diversity within this group of university graduates, suggests that immigration policies that select people only on the basis of their educational attainment may not be successful in identifying and attracting the most skilled ones. Other factors may need to be taken into account, such as language proficiency or specific work-related skills.

Labour shortages and migration

- To meet EU2020 employment targets, European policy makers will have to rely on a menu of policy choices to bring people into the workforce. This may involve a significant share of the currently inactive EU population, or a reliance on migration and other socio-demographic policies, to ensure that the future supply of labour will be sufficient to meet needs.
- It seems likely that the low levels of highly skilled labour migration in many European countries have less to do with low attractiveness than with the fact that employers are not recruiting significantly from abroad.

Editorial

Turning the corner

A turning point for the European labour market

This year marks a turning point for the European labour market in many ways. Firstly, after many years of debate about the expected effects of population ageing on the European labour markets and welfare systems, in 2014 for the first time the working age population (15-64) of the European Union starts declining. Over the next twenty years, according to the most recent Europop projections, it will decrease by about 21.7 million persons, or 6.5% in the EU28. This will potentially generate a decline in the labour supply and potential economic growth, unless European countries manage to mobilise under-utilised labour resources as well as promote faster technological progress and productivity growth. But immigration will need to play a supporting role as well.

Secondly, in January 2014, with the end of the transition period for Bulgaria and Romania, the area of free movement of workers was expanded to cover 27 EU member states. This area is set to increase with the gradual lifting of the restrictions for Croatian workers in the next years. Since Croatia's accession to the European Union, the EU labour market counts more than 331 million persons of working age, compared to less than 225 million in the United States and 79 million in Japan.

Facilitating a better allocation of the workforce across the EU countries, by improving job and skill matching, will be key to overcome the persistent scars of the Great Recession but also propel economic growth in the short- and medium-term.

Thirdly, the Europe 2020 Strategy, which provides a roadmap for EU's growth strategy for the coming decade, is now almost half-way through. Much remains to be done, however, to reach the employment rate target of 75% by 2020. In the first quarter of 2014, unemployment affected almost 11% of the labor force in the European Union and the employment rate, which has been slightly decreasing since 2009, stands at 68%. Closing the gender gap and improving labour market inclusion of both youth and the elderly are central elements to this strategy, but the employment targets cannot be met without making full use of all available skills and notably without enhancing the labour market outcomes of vulnerable groups, including immigrants and their children.

Against this background, notwithstanding the increasing risk of a nationalist fall-back and of an immigration backlash, labour mobility within Europe and immigration have a role to play to mitigate current and future labour market imbalances, and ultimately, to support inclusive economic growth in Europe.

What policies and practices are needed to ensure that migration and free movement contribute to meeting the labour market shortages that are expected to arise over the short-to-medium term? How can we make a better use of migrants' skills? What are the lessons learnt from non-European OECD countries, particularly in the management of labour migration? These are some of the key questions behind the three-year research project jointly carried out by the European Commission and the OECD on "Matching economic migration with labour market needs".

Migration is already playing an important role to counterbalance the effects of population ageing on the labour market …

All OECD countries are confronted with the effects of population ageing, but the European Union and Japan will be impacted first and much more severely. The EU28 working age population (15-64) is projected to decline by 2.2% between 2013 and 2020, while it will grow in the same proportion in the OECD area as a whole. Without migration, the working-age population of the 28 EU countries will decline by more than 11 million by 2020 (80 million by 2050). Under this scenario, Germany, Italy, and Poland would each lose more than 1.5 million people of working age by 2020. Similar trends are observed for example in Japan (-8 million), and to a lesser extent Canada (-1 million). In the United States and Australia the working age population, will remain stable.

The effects of demographic changes on the labour force are, however, less clear cut because they result from a combination of several effects associated to changes in the age structure of the working-age population and in participation rates by gender, age and education level. At current projected levels of net migration and participation, the European labour force will actually increase slightly by 1.2% between 2010 and 2020. To achieve that, it will be necessary to implement ambitious and efficient activation policies that reach out to all. Moreover, closing the gap in terms of participation rates between immigrants and their native-born counterparts with similar characteristics would generate as much as 1 million additional workers in the European Union.

Beyond, it will no longer be possible to counteract population ageing via higher participation rates so as to satisfy the wide range of anticipated needs which will arise across the full spectrum of skills. In this context, productivity growth may appear as the only sustainable option for economic progress and to achieve this, skills development, distribution and use will be critical.

… by supplying skills across the full spectrum

Observed and future labour and skill shortages are not a simple function of demographic imbalances in the labour force, but depend significantly on the changing nature of demand for particular skills and the extent to which these can be filled from existing sources of supply. The nature of labour force needs will also be a function of changes in the nature of production related to globalisation and the evolution of new technologies. The outlook for economic growth and the rise of emerging countries will have a non-negligible impact on the mobility of goods, capital and persons. Industrial restructuring firm relocation – current and to come – and the growing importance of the information and service economy will bring about changes in the nature and characteristics of labour market needs and thus of the skills required.

Between 2000 and 2010, immigrants represented 70% and 47% of the increase in the labour force in Europe and the United States, respectively. Over that decade, the share of

tertiary educated both native- and foreign-born individuals in the labour force have increased by 50%, both in Europe and in the OECD area as a whole. This trend is expected to continue in the near future, although at lower rates than in the past, essentially because the growth in the number of highly educated retiring workers will increase. The ratio of new entrants to retirees in the labour force with tertiary education in Europe is projected to decrease from 3.5 in the period 2000-10 to 1.4-1.7, depending on the scenario, during the period 2010-20.

In the past ten years, the new immigrants represented 15% of entries into the rapidly growing occupations in Europe and 22% in the United States. They are thus playing a significant role in the most dynamic parts of the economy.

In the meantime, in occupations where overall employment is declining, notably trades, the number of entries of young workers has been insufficient to compensate for the large retirement waves of older workers. As a result, new immigrants had to fill the gaps. They represented 24% and 28%, respectively, of entries into the most strongly declining occupations in Europe and the United States.

Taking into account the large differences in educational attainment between entry and exit cohorts and in entry and exit from growing and declining occupations, the potential need for immigrants in the context of population ageing cannot be assessed on the basis of demographic imbalances alone. The profile of labour migrants will also need to adapt in order to respond to rapidly changing labour market needs and should probably involve a broader range of qualifications.

But migrants' skills are largely underused …

Migration policies have become more selective and this is reflected in a greater share of highly educated migrants among recent migrants, in comparison with those who have been settled in the country for longer. However, on average, immigrants have studied almost a year less than native-born of the same age and gender in Europe and one and a half years less in the United States. Furthermore, immigrants bring qualifications from the origin countries that are often different from those of the native-born. Indeed, both in Europe and in the United States, 69% of the foreign-born have completed their education outside of the host country.

Despite their overall lower level of education and qualification mismatch, there is a widespread under-utilisation of actual migrants' skills. Highly educated immigrants tend to get lower returns to education than native-born in terms of employment, occupational matching and earnings and foreign degrees and work experience are strongly discounted. This is true in Europe as well as in most other OECD countries. New evidence from the OECD International Survey of Adult Skills (PIAAC) shows that the underuse of migrants' skills is due to a variety of factors, including employer uncertainty about migrants' skills non-equivalence, employer preference, etc., but that the lack of language proficiency plays a particularly critical role. On average, foreign-born persons in the OECD countries participating in PIAAC have lower scores in literacy proficiency of about 27 points, which corresponds to half a level in terms of literacy proficiency, than the native-born.

These findings call for the implementation of labour market policies and strategies to better use migrants' skills to respond to emerging skills needs. This would include: i) investing more into bridging offers; ii) promoting the assessment and recognition of foreign credentials and diplomas to tackle employer uncertainty about the true value of foreign degrees; and iii) encouraging potential candidates to learn the language of the country they would like to migrate to. Furthermore, the significant heterogeneity that is

observed within the group of university graduates suggests that immigration policies should not only select people on the basis of their educational attainment, but also try to facilitate the identification and recruitment of those with the right skills set.

… and labour migration management systems often poorly equipped to ensure skill matching

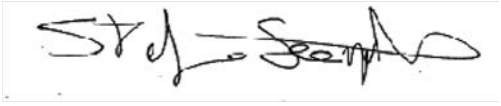
Trying to adjust economic migration to labour market needs is a significant challenge. In order to do so, EU and OECD countries use a variety of labour market indicators aiming at identifying shortages. Evidence shows that objective labour market information, such as vacancy rates, unemployment rates, and changes in wage rates can be useful in identifying shortages, but relying on such market signals alone is sometimes misleading.

In the European Union, there is little labour recruitment from non-EU countries. It accounts for at most 5% of all migration in northern and western Europe, plus an additional 4% arriving as intra-corporate transferees. In Southern Europe, the percentage of non-EU migrants who are recruited from abroad is about 10%. In total no more than 13% of all tertiary educated migrant workers arrived as labour migrants with a job offer.

Experience from several OECD countries has shown that despite the adoption of fairly open migration regimes, notably for the highly skilled, few migrant workers actually come. Employers do not necessarily make full use of the legal opportunities to fill positions from abroad, either because they require certain language skills, or because they have difficulties valuing foreign qualifications and work experience. This can be an obstacle especially for small and medium enterprises, which are a key driver of growth and job creation and where labour shortages tend to be most acute. Indeed, multinational companies can use their intra-firm networks to move staff around, but the small and medium-sized local firms do not necessarily know where to start, or do not even consider to look abroad for needed skills. Successful migration policy increasingly requires governments to work closely with employers, and indeed migrants themselves, to understand their respective needs and to provide bridges. Ensuring greater retention, encouraging migrants to come with their families and inducing potential candidates to learn national languages will often require more incentives than are currently offered.

This project has provided a new perspective on the contribution of international migration to labour force growth. It demonstrated that its role in counterbalancing the effects of population ageing will depend in a critical manner on the capacity of countries to match labour needs to migrants' characteristics. In this regard, acknowledging the results of the new PIAAC survey presented in this publication, it appears that much more needs to be done to better use migrants' skills and to adapt labour migration management systems to employers' needs.

Stefano Scarpetta



Director,
OECD Directorate for Employment,
Labour and Social Affairs

Georg Fischer



Director for Analysis, Evaluation and External Relations
DG Employment, Social Affairs and Inclusion
European Commission

Part I. Demographic context

Chapter 1

Demographic trends, labour market needs and migration

François Héran
French National Institute for Demographic Studies, Paris, France

The contribution of migrants to receiving countries is a controversial issue. Statistics on the demographic contribution of migration can be presented from different perspectives on flows or stocks, taking into account first generation of immigrants or also their children. These figures reflect different time perspective on the contribution of migration to population growth and age structure. In terms of demographic growth, migration is in balance with the baby boom and increased life expectancy, and the effects of these two phenomena are often overlooked. In the case of France, from 1946 to 2014, international migration contributed to approximately one third of population growth.

Can migration counterbalance the effects of population ageing in terms of labour needs? Although the utilitarian case for immigration commonly argues the capacity of migrants to counter population ageing, labour migration can only play a limited (as in many longstanding immigration countries family and humanitarian migration are relatively much more important) and a temporary role (as migrants age).

The history of migration over the three last centuries reveals a permanent tension between two extreme visions: migration restricted to work migration adjusted to short-term economic needs, versus settlement migration. The main challenge for migration policy is to find a form that conciliates both.

1.1. Introduction

The demographic and economic contribution of migrants to sending and receiving countries is a controversial issue, and is a typical example of a debate in which logical or scientific reasons are not sufficient to convince public opinion. Demographers commonly estimate net migration rates, i.e. the share of population growth due to net migration (inflows minus outflows), taking as a reference the total number of inhabitants in the country at the beginning of the year. This indicator is generally expressed per thousand and ranges between 1 and 6 per thousand in most western countries.

However, net migration rates do not inform the public debate on immigration even when levels reach record highs (for example, around 10 per thousand in Germany in the 1990s and 15 per thousand in Spain in the mid-2000s). Policy makers and the media are not familiar with the order of magnitude of net migration (or birth or mortality rates expressed the same way). If demographers try to make the net migration rate more accessible by converting it into percentages (for instance 0.3% instead of 3 per thousand), they are often suspected of minimising the importance of migration because relating annual flows to the national population leads to an apparently derisory figure.

Migrants and population growth: From short-term flows to sustainable stocks

A more pedagogic presentation of net migration flows can be seen when comparing the respective contributions of net migration and natural increase to the annual population growth. The question is simple: compared to natural growth, is net migration higher, equivalent or lower? If net migration is positive (more immigrants than emigrants) while natural growth is negative (more deaths than births), the contribution of migration to population growth will exceed 100%, i.e. migration will either fully or partially compensate for population decline and become the only engine for population growth. For example, since the beginning of the 1970s, Germany's population would have been in decline without the positive contribution of migrants.

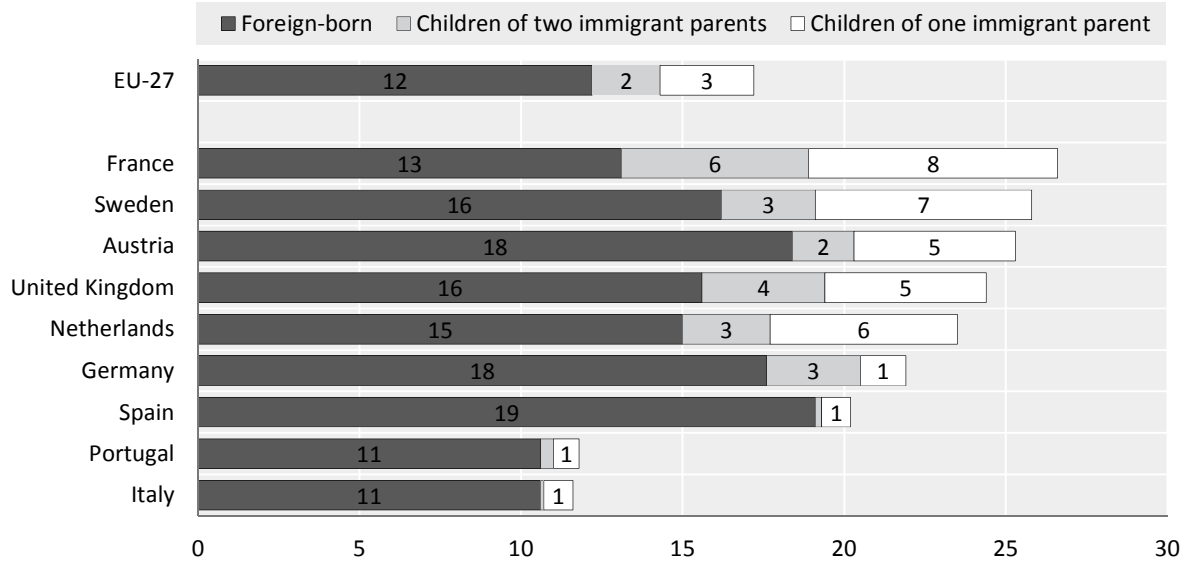
It must be remembered, however, that the comparison of net migration with natural growth cannot be interpreted as a clear-cut distinction between external and internal growth. Births registered in a determined year can be partly due to immigrants who settled in previous years. In addition, native-born may contribute to net migration through expatriation and returns.

To measure the impact of migration flows on the "stock", it is necessary to shift from a short-term to a long-term perspective which raises the question: to what extent is the population mix of a host country affected by the migration stock accumulated over decades? The best way to estimate this phenomenon is to conduct surveys or censuses that gather information on the origins of the population (countries of birth and former citizenships of both parents). In countries which previously saw high levels of immigration, such as France, Germany, the Netherlands and the United States, the foreign-born population constitutes approximately 10% of the total population. By adding the so-called "second generation" (i.e. native-borns with at least one foreign-born parent) this figure may approximately double and range between 15% and 25%. In France, for instance, 22% of the total population is either foreign-born or born to foreign-born parents, and constitute 26% of the workforce (Figure 1.1). This figure is a recent outcome from national surveys conducted since 1999 and has been widely reported in the media.

The share of "people with a migrant background within host OECD countries is now so important that the question of their "utility" is no longer relevant. There is a case for

estimating the fiscal and social costs of annual inflows and outflows of migrants (OECD, 2013), but the financial estimate should not extend to the stocks of population with a migrant background, including ex-migrants of all ages and the second generation. Does it make sense to ask whether 20% or 25% of the population are "useful" to the rest of the population?

Figure 1.1. Percentage of immigrants ("1st generation") and children of immigrant(s) ("2nd generation") in selected countries



Source: Eurostat Labour Force Surveys, ad-hoc module 2008.

Migration between too thin flows and too large stocks

From the perspective of the public debate, demographics on migration produce unexpected figures with a high percentage of the population with a migrant background on one side, compared with very low figures of net migration expressed per thousand on the other. Although a classic phenomenon, this contrast puzzles many. By definition, the order of magnitude changes when it comes from the flows to the stock. Each annual tree-ring may seem modest but if the same process is to be repeated over decades the trunk will eventually reach a respectable size. Demographers are alternately suspected of minimising immigration flows (to put public opinion at rest) and inflating the size of the "migrant stock" (to emphasize the irreversible reality of the settlement of migrants and their families).

In recent immigration countries, however, especially in southern Europe, the proportion of children of immigrants is still very low. Consequently, the high proportion of immigrants in the total population is rightly perceived by the general public as the consequence of recent massive inflows of new migrants (as illustrated in Italy and Spain). In France, in contrast, the correlation between stock and flows is not as straightforward. It is widely believed that the high percentage of population with a migrant background is due to the recent influx of newcomers. In fact, it is the product of migration over a number of decades, involving several generations.

Factors of demographic growth: Migration in balance with the baby-boom phenomenon and increased life expectancy

Another widespread myth is that population growth in in many EU countries since World War II is entirely due to immigration because fertility rates, the other motor of population growth, have not reached the replacement rate of 2.1 children per woman. This view is erroneous and should be tackled with counterfactual projections (i.e. what would have happened without…?). These projections identify the different factors of population growth over a long period of time and, consequently, take a weighed view of the contribution of migration to population dynamics in general. Priority is no longer given to the binary distinction between native and foreign-born people but to the dynamic relationship between migration and the other driving forces of demography, namely increases in life expectancy and variations in fertility rates, especially the long lasting impact of the baby boom.

In France, for example, the last counterfactual projections published[1] highlight that without migration, the baby boom or a decline in mortality, it would have a smaller population in 2014 than in 1946 (34 million people instead of 40 million) due to the age structure of the population before World War II. In the wake of the war, in 1939, France had the oldest population in the world (a record now held by Japan). However, from 1946 to 2014, France's population rose by 24 million, i.e. an absolute gain of 30 million. Of the population growth in France during this period:

- 33% was due to immigration (10 million)
- 35% was due to the baby boom (10.5 million)
- 32% was due to increases in life expectancy (9.5 million).

This kind of exercise has several merits. First, it is a reminder that population ageing is not only a consequence of the decline in fertility rates but also of the steady increase in life expectancy since the 1970s (three months per year, six hours per day), a factor of population growth which is commonly overlooked. The mechanical consequence of a longer life expectancy, where longer lives mean more lives at the same time, is often underestimated.

Another overlooked factor is the long lasting impact of the baby boom. Although the baby boom ended around 1974, it generated an increase in women of childbearing age which, in turn, generated a secondary increase in the following generation, despite the decline in fertility. Variations in life expectancy, fertility rates and migration interact, and calculating the respective contributions of these three factors to population growth rests on simplified assumptions. Moreover, results may vary from country to country. Systematic data are lacking but it would be interesting to extend the same counterfactual projections to all OECD countries. The relative impact of the baby boom is certainly lower in Germany, which experienced a later and shorter baby boom than France, the United Kingdom or the United States. Whatever these variations, demographic growth experienced by western countries since World War II cannot only be attributed to immigration.

Second-degree utilitarianism

Humanitarian associations have a very different strategy and ask economists or demographers for arguments in favour of immigration to counter anti-immigration opinions. In so doing, they use utilitarian arguments they do not necessarily believe in

(second-degree utilitarianism) because they think policy makers will only understand utilitarian language.

Under such conditions, why should economists and demographers participate in this debate? After all, if human rights defenders have to reason in accordance with their own convictions, they should use arguments based on the defence of rights. Consequently, receiving countries ask: are immigrants really there to fix the age pyramid and fill the depleted labour force (cyclical or contingent reasons) or simply because they have the right to migrate (permanent reason)?

The problem with the utilitarian justification is that it is contingent upon circumstances. In France, young immigrants are a minor complement to the age structure. In Germany, they substitute unborn children and alleviate the labour shortage. The cost-benefit analysis of migration for social accounting, growth, wages, etc. does not provide firm results and clear orientations. Rather, it depends on the stage of the life cycle and, at the macro-level, on the history of past migration waves. Respect for human rights, however, is far from being a contingent argument, rather it is an overarching ideal, a permanent necessity.

There are therefore two different registers of necessity. On the one hand, the equality of rights is a categorical, universal and permanent imperative. On the other are demographic or economic goals, such as replacing generations or labour market equilibrium. Neither goal is self-evident nor consensual.

"A day without immigrants": Empirical experience or thought experiment?

The utilitarian case for immigration makes a recurrent use of counterfactual scenarios, examples of which, and their conceptual limits, are outlined below.

In an article published in 2013, Mehdi Hasan, Political Director of *The Huffington Post UK* wrote that "without immigrants, our country wouldn't function. So let's give it a go for 24 hours" (Hasan, 2013). Former Florida Governor Jeb Bush also offered an interesting variant of the counterfactual argument, combining the business case for immigration ("they create far more business"), the demographic case ("they bring a younger population") and a moral case ("they love families", they have "more intact families").[2]

The origins of the "what if not" scenario for immigration in the United States can be traced back to the success of the mass demonstrations against the "Sensenbrenner Bill" which was passed by the House of Representatives in December 2005. The proposal included, *inter alia,* criminal penalties for "aiding and abetting" illegal aliens, the definition of illegal presence as a felony and the construction of a double-layered 700 mile fence along the United States-Mexico border. On 1 May 2006, the "Great American Boycott" succeeded in mobilising approximately one million marchers across the nation, essentially Hispanic migrants. It was soon labelled "A day without illegals" or, more commonly, "A day without immigrants". The Bill was eventually rejected by the Senate. However, as successful it was from the political point of view, the Great Boycott failed to prove that the withdrawal of a significant share of the migrant working force could seriously jeopardise the American economy in a single day. The counterfactual demonstration turned into a symbolic thought experiment. The economic impact of this counter-scenario is so far unknown.

This inspired a similar movement in Paris and other cities across France. On 1 March 2010, journalists Nadir Dendoune and Nadia Lamarkbi, and history teacher,

Peggy Derder, launched "A day without immigrants: 24 hours without us" ("*La Journée sans immigrés: 24 heures sans nous*"). The movement stemmed from racial profiling by police, and discrimination and xenophobia in general but did not call for the legalisation of illegal migrants. Despite wide media interest, it did not rely on a mass movement of the population. The promoters were apolitical and their idea was not to assess the economic impact of a nationwide boycott by migrant workers, legal or not. A second "Day without immigrants" was held on 1 March 2011 but there was no follow-up and it failed because it was launched without, or with too few, immigrants.

Beyond the question of the financial and strategic resources mobilised through such movements, their limited outcome needs an in-depth interpretation. Why was it so difficult to persuade immigrants to demonstrate their importance through boycotts or counterfactual scenarios? After all, immigrants and their children make up a significant share of the workforce in several sectors of the economy, in particular in the less skilled sectors.

Paradoxically, the question of utility becomes more obsolete the greater the number of immigrants in a country. Outside periods of expansion or reconstruction, immigrants and their children are no longer indispensable as such, i.e. by their specific skills. They undoubtedly count but simply because they make up a component of the whole society among others. After all, every social category (profession, age group, gender, residential area, etc.) could claim "a day without us".

Resorting to young migrants to counter population ageing? United Nations projections

The utilitarian case for immigration commonly argues the capacity of migrants to counter population ageing in the receiving country. The systematic introduction of young migrants would save western countries from demographic decline.

However, there are important limits to this assessment.

When looking at the issue, demographic projections released by the United Nations Population Fund (UNFPA) can be used to highlight the relative growth of each age group over the next 50 years. The most solid part of these projections is the trend in the number of people aged 60 years or more (all of whom are already born). While calculating the prospective number of births is more problematic, it is still possible for the next 20 or 30 years since the number of women of childbearing age over this period is already known (but not their propensity to have children). In contrast, there is no way to estimate the importance of net migration over the next decades.

In Germany, projections confirm that the oldest age group will continue to grow (by 75%) as a direct consequence of increases in life expectancy and the baby boom. The sharp decline of the middle and the youngest age group (by more than 25%) is due to the decline in fertility rates far below the replacement level. The interval between the upper and the lower curves illustrates the importance and inexorable character of population ageing in Germany.

Family policies (aimed at enhancing fertility) or migration policies (encouraging repeated inflows of young migrants) cannot impact the trajectory of the upper curve, since it only depends on progress in life expectancy among the elderly. They only have a limited effect on the lower curves. Instead of declining by 25%, the active age group in Germany could decline by only 15% to 20% if family and migration policies are strongly combined. Increasing employment rates of seniors and juniors could also be a

contributing factor. This slight reduction in the gap between the growth of seniors and the decline of juniors will, however, not succeed in offsetting the ageing process, evidenced by the gap between the curves. Young migrants cannot counter population ageing, they can only mitigate it.

No French exception for mortality and "ageing up the pyramid"

The comparison with France illustrates the similarities and differences between the two demographic regimes. To put it in simple terms, while France sees an exception in terms of fertility rates (in contrast with most of its neighbouring countries), it does not see one as far as mortality and life expectancy are concerned.

The reason for this dissymmetry is simple. The reasons for an ageing population in France follow a general phenomenon in other OECD countries: increased life expectancy, reinforced by the structural impact of ageing baby-boomers. France will not escape a rapidly ageing population over the coming decades, nor will the United Kingdom or the United States. The difference lies in the middle and the youngest age groups. Thanks to a fertility rate close to the replacement level, France will maintain a stable workforce over the coming decades. Migration contributes to this stability, but only as a limited complement, not as a "replacement migration" for unborn children as in Germany.

Settlement v mobility: The need for synthesis

Academic research on migration currently prioritises "circulation", "mobility", "transnationality" and "diasporas". Important as they are, these realities cannot offset the fact that the majority of migrants and their families settle and establish roots in the host country. One would not understand otherwise why immigrants or children of immigrants (first and second generation) make up more than 20% of the total population in the biggest European countries (France, Germany, the United Kingdom). Transnational practices do not exclude settlement. It may even facilitate the rooting process, since mobility is now a generalised phenomenon, shared by migrants and non-migrants.

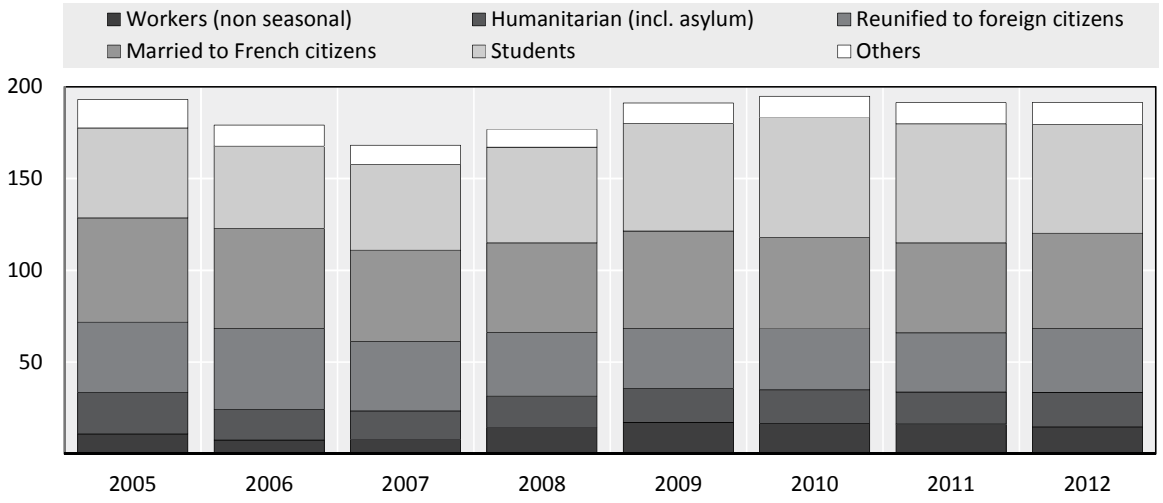
Immigration is a long-term process. Migrants themselves underestimate the length of stay their economic projects require. They also marry and establish families with growing children. As already indicated, if a significant share of migrants prefer to return to their home-country or move on elsewhere, the majority eventually settle and contribute to reshaping the composition of the host country. In practice, labour migration is generally followed or accompanied by family migration. Circulation ends up in settlement. Demographers should not rule out one of these behaviours but articulate them both. In these conditions, justifying migrations by contingent and variable needs does not cover the long lasting process of migration, perpetuated by chains of information and contacts, and by long-term strategies in favour of the next generation.

Old immigration countries since 1975: Disconnect between inflows and economic needs

Utilitarian justifications for immigration are limited by the importance of migrant inflows linked to the exercise of rights, compared with the response to economic or demographic needs. In France, the majority of first permits allocated to migrants correspond to the first admission category (Figure 1.2). From 1975 onwards, migration inflows no longer followed economic cycles, at least in old immigration countries.

Figure 1.2. The weight of family and humanitarian migration to France

Annual inflows of registered migrants from non-EEA states by admission category, 2005-12



Source: First residence permits granted to non-EEA immigrants (French Ministry of the Interior).

Previously, migrants were recruited to rebuild countries during the post-war period and to ensure economic growth in times of prosperity. More recently, they are recruited to work in hospitals and mitigate population ageing. The case for migration takes the form of utilitarian arguments: migration is indispensable to fill the gaps in the population pyramid and the workforce. The question, therefore, is: should international migration be justified by economic and demographic reasons or for the sake of human rights?

Admittedly, the primary factor in the decision to migrate is economic. People migrate to have a better life for themselves and for their family. In order to achieve this goal, applicants look for a host country which offers the required economic, social and political opportunities, particularly a level of governance that offers a secure and predictable environment for building a new life. However, having obtained a residence permit on grounds of human rights, these non-economic migrants may then enter the labour market. Thus, the bulk of non-labour migrants are *de facto* labour migrants, although in many cases they officially enter for marriage, asylum or educational reasons.[3]

From the 1970s onwards, the official admission categories used for migrants corresponded less closely to the real motives for migration. Beyond the administrative classification, migration flows in many countries no longer followed economic trends. Three groups of countries can be distinguished (Figure 1.3).

In countries with a history of immigration – France, Germany and Switzerland – foreign-born employment rates are lower than those of native-born, since they have not entered the country with a job offer but as family or humanitarian migrants. This trend is even stronger in the Nordic countries selected here, probably because of their active asylum policy. The relationship is reversed in the new immigration countries of southern and central Europe where immigrants have a higher employment rate than the native-born, because they have been directly attracted by job opportunities. Accordingly, they are also younger than migrants to the rest of Europe. The case of the United States deserves special attention as it looks as if the steady inflows from Mexico and Central America will transform the nation into a permanently young immigrant country.

Figure 1.3. Differences in employment rates between foreign-born and native-born in OECD countries (men and women), 2001-12



Source: *Database on Immigrants in OECD Countries (DIOC)*, www.oecd.org/migration/dioc and Labour force surveys, moving average on three years.

From "Birds of Passage" to the application of rights, regardless of the economy

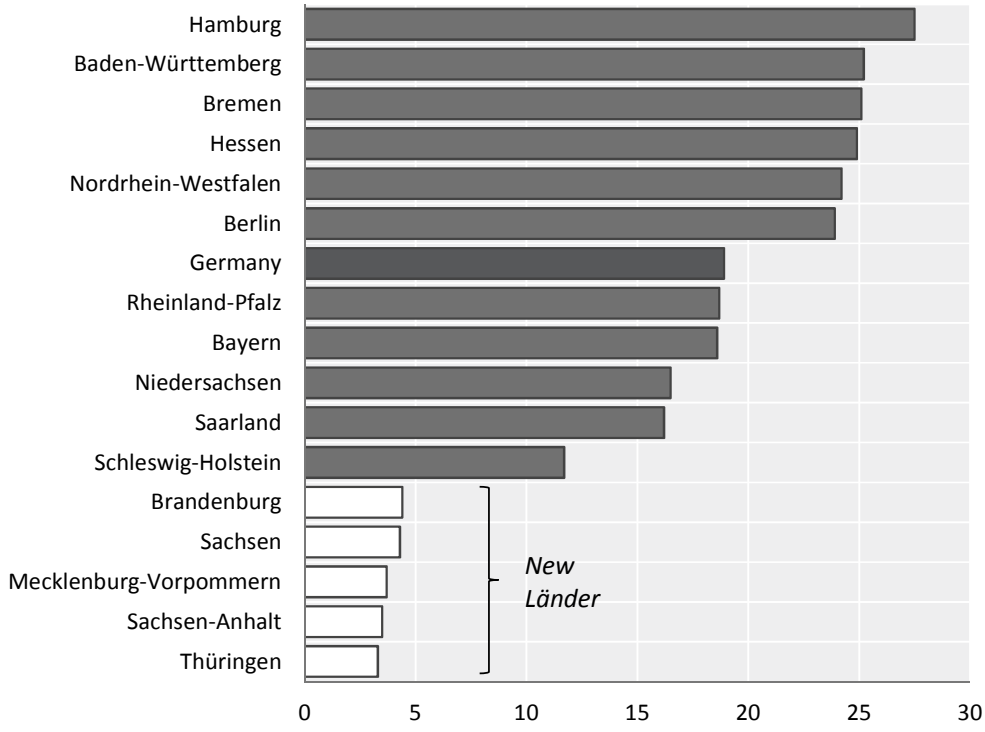
In *Birds of Passage*, Michael Piore (1979) explained that the main constraint upon migrants before the oil crisis was the pressure exerted on them not to settle. In order to adjust human resources to labour market needs, the employers prefer to deal only with "birds of passage". If the objective is to narrowly tailor migrant flows to the needs of the economy, work contracts should not exceed a couple of years. Such a view prevailed throughout Europe prior to the 1974 oil crisis transition and before large numbers of migrants began settling for the long-term. Interestingly, it is a view which is making a comeback.

Piore's model was based on the premise that migrants do not really volunteer; that their degree of freedom is severely limited; and that they do jobs the native-born population do not want to do. Migrants not only benefit industry but also help consolidate the privileges of the insiders, especially native-born with protected status. Migrants themselves have no intention of staying in the host country; they simply want to save enough money to return to their country of birth. Any prolongation of the stay for family or financial reasons is seen as a failure (for instance, underestimating the cost of finding a home to house a bigger family). According to Piore, things change when migrants redo their accounts and resign themselves to staying in their new country. Their children have gone to school and are increasingly acculturated; they aspire to qualified jobs that place them in competition with native-born workers and are unwilling to "return" with their parents to a country of origin with which they are not familiar.

A new source of inflows: Human rights disconnected from economic needs

After the onset of the 1973-74 oil crises, some European countries responded to rising unemployment by drastically reducing direct inflows of workers, admitting them under a selective exemption system. At the same time, governments and public opinion realised that migrant inflows were increasingly fuelled by compliance with international human rights agreements: the right to cross-border marriage, the right to family reunification, the right to seek asylum and later a right which, although less formalised was nonetheless real, namely the right to go abroad to complete one's education in a good university. The majority of migrants no longer enter a country for economic reasons, rather simply because they have the right to do so. France offers a striking example of this prevalent situation (Figure 1.2).The contrasted situation between German Länders also illustrates the weight of history in shaping migration (Figure 1.4).

Figure 1.4. Proportion of population "with a migration background" (first + second generations) in German Länder



Source: German census 2011.

The old idea that migration inflows and outflows logically follow the curve of economic activity is certainly valid for new immigration countries, but not for the old ones where the low elasticity of migration flows to economic trends has been observed since at least the 1970s. In Spain, the burst of the financial bubble was followed a couple of years later by that of the migration bubble. No institutional or legal mechanism could have cushioned this direct impact. There is a significant difference between an economic incentive and a right. If a migrant entered a country legally thanks to the recognition of a right (and all the more so if it is a human right), a change in the economic context will not be a motive to leave the country. However, if a migrant migrated primarily for economic

reasons, whatever their legal status, they may prefer to move from this country to one which is more attractive. At the risk of exaggerating, the recognition of a right of entry, as opposed to an economic incentive, might potentially be an institutional trap.

From the point of view of migrants, this rigidity is also a protection: rights are not a bubble liable to burst at any shock. However, as pointed out by Daron Acemoglu, a Turkish-American economist, the guarantee of stable and protective institutions can be integrated into a more comprehensive view of well-being. With regard to migration, rights and markets are not enemies, they follow different lines, but reconciling them is a reasonable challenge.

1.2. Conclusion: Learning from the past – Conciliating economic needs and human rights

The history of migration over the three last centuries reveals a permanent tension between two extreme visions: migration severely restricted to work migration adjusted to short-term economic needs, versus settlement migration (including the possibility of family unification, local rooting, unlimited residence permits and full integration by the rule of law). Many intermediate solutions have prevailed. In general, the victory went to the second argument. The narrow-minded concept of short-term recruitment of workers without family attachments has been incarnated in a long chain of systems: slavery, indentured workers, the "ticket-system", the "Birds of Passage" system. It is still incarnated in the sponsorship system established in some Gulf States. The downside is well known: gender and age imbalances, shortage of women of reproductive age, negative natural growth (below the replacement rate) and the need to cope with a high turnover in recruitment. The opposite approach integrates the necessity of raising and training the younger generation. The gamble being that long-run costs are lower than those of perpetually reconstituting the workforce from abroad.

Since human rights have become a driving force in human mobility, inflows and outflows of migrants will no longer narrowly follow the changing curves of economic (or demographic) needs, except in new immigration countries. The real challenge to migration policy is to find a form that conciliates economic needs and human rights. Training, language courses, integration courses (practical initiation to daily life, economic issues, civic procedures, socialising with other groups) are necessary in this respect. It may seem expensive in the short-term, but in the long-run it is certainly beneficial to society at large.

Notes

1. Aubry et al. (2004)for the 1946-2004 period; Breuil-Genier et al. (2011) for the 1980-2010 period.

2. Jeb Bush : "America will decline without immigrants", *MSN News*, 14 June 2013.

3. Incidentally, family reunification of women is not always associated with labour force participation. In most countries of the Arab-Muslim area, the average participation rate of women is strikingly low: 29% in North Africa, 23% in Western Asia, compared to 43% in Central America or 57% in Southeast Asia (UN-DESA, *The World's Women 2010*, New York, p. 77.). Such a gap is logically reflected in the high rates of unemployment among the first generation of Turkish or North African women living in western countries. However, a possible reason for female emigration may be precisely the desire to find a more favourable environment for working women, at least for their daughters.

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Chapter 2

Demographic change and the future of the labour force in the EU27, other OECD countries and selected large emerging economies

Jason Gagnon
OECD

Starting with a wider perspective on long-term demographic trends worldwide, this chapter concentrates on the evolution of the working-age population to 2020 and then discusses the implications regarding the evolution of the workforce. It then briefly considers the role of alternative policy instruments, including international mobility, in responding to the challenges posed by population ageing.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

2.1. Introduction

Demography is one of the key drivers of economic change at regional, national and international levels. With population ageing upon us and the looming decline of the working-age population in many OECD countries, concern regarding the consequences of current demographic trends has become both more concrete and pressing. They have been discussed in international fora and reports covering a wide range of economic and social areas, including potential growth and productivity,[1] the functioning of the labour market and labour shortages,[2] the sustainability of pension[3] and welfare systems,[4] the management of migration,[5] international relations,[6] among other fields.

The demographic parameters of the debate are well known, notably in Europe where the old-age dependency ratio is expected to reach 30% by 2060, up from about 17% in 2010 (European Commission, 2011). Demographic imbalance in the size and age structure of the population will increase both within and between countries in most regions of the world. International migration is an important element to take into account in this context, but it cannot be expected to play a counterbalancing role, a point demonstrated by a widely cited UN report on *Replacement Migration* (United Nations, 2001).

While most analyses have focused on the working-age population, the evolution of the size and composition of the workforce has been largely overlooked. As labour market participation varies by age, cohort, place of birth and within countries, the evolution of the workforce may diverge from that of the working-age population. A great level of heterogeneity is actually revealed across countries when these aspects are taken into account, although the general trend remains unchanged.

Starting with a wider perspective on long-term demographic trends worldwide (Section 2.4), the chapter concentrates in Section 2.5 on the evolution of the working-age population to 2020 and then discusses the implications regarding the evolution of the workforce (Section 2.6). It then briefly considers the role of alternative policy instruments, including international mobility, in responding to the challenges posed by population ageing (Section 2.7).

2.2. Main findings

- The past century was characterised by rapid population growth – with world population increasing from 1.6 to 6.1 billion. By 2050, Europe will have about 720 million inhabitants including around 520 million within the EU27 corresponding to 5.5% of world population. The United States will remain the third most populous country in the world, with an estimated number of 400 million inhabitants.
- Population is ageing rapidly in Europe but also in China. On average the median age will rise from 29 to 38 by 2050. It will eventually reach 47 years in Europe and 42 years in Asia, compared to about 26 years in Africa.
- Working-age population (15-64) is slated to shrink over the 2010-20 decade in the EU27 (-1.5%) and grow only modestly in the OECD area (+2.2%). It will continue, however, to grow rapidly (9%) in large emerging economies.
- Labour force participation of the population aged 15-64 is significantly lower in the European Union than in other OECD countries but participation of women is increasing

rapidly. The International Labour Office's projections suggest a general increase in the participation rate by 2020 (close to 75% for both the OECD and the EU27).

- Building on population and participation rate projections it appears that in the EU27, on average, the labour force will be higher in 2020 by almost 3% than it would have been had participation rates remained constant. The corresponding figure is about 2% for the OECD as a whole while accounting for the evolution in participation rates makes very little difference for large emerging economies.
- At current projected levels of net migration and participation, the European labour force will nevertheless increase (+1.2%) from 2010 to 2020. To achieve this result it will be necessary, however, to implement ambitious and efficient activation and migration policies.
- International migration largely contributed to population growth in the past two decades and its contribution is projected to increase significantly based on current net migration scenarios, although the economic crisis has structurally altered the nature of some of these flows.
- Most migrants arrive during the most productive years of their lives and recent immigrants are more highly educated than the resident population and previous migrant cohorts in most EU countries as well as in other OECD countries, except in the United States and in Southern Europe. Relatively few permanent immigrants are admitted as labour migrants (approximately 20% in the OECD) but other migrant categories can also contribute to the workforce of destination countries.
- If the foreign-born had the same participation rate as comparable (age, education, sex) natives in the European Union, the EU workforce would increase by about 1 million workers, corresponding to several years of permanent migration. Doing so in the United States, on the contrary, would lead to negligible changes in the United States.
- While migration has an important role to play in counterbalancing the negative effects of population ageing it cannot be the sole, or even the main, response to address structural demographic, labour market or fiscal challenges.

2.3. Long-term global demographic trends

The United Nations population projections from 1950 to 2100 are plotted in Figures 2.1 and 2.2, providing an indication of the longer-term demographic trends by region.[7] The past century was characterised by rapid population *growth* – with world population increasing from 1.6 to 6.1 billion. In the wake of fast economic development came improvements in family planning and health care: women began having fewer children and people were living longer (United Nations, 2005). The growth rate of world population peaked in the 1960s and has been in decline ever since. In 2010, world population growth was still slightly over 1%, but the pace of growth has been decreasing.

By 2050, Europe will be expected to have about 720 million inhabitants including around 517 million within the EU27, corresponding to 5.5% of the world population. In contrast, while population growth rate peaked in the United States in 1957, it has remained fairly stable since 1970 (Heisler and Shrestha, 2011). By 2050, the United States will remain the third most populous country in the world, with an estimated number of 403 million inhabitants.

By the year 2100, the United Nations project world population to reach 10 billion people. Population will eventually decline in Asia while it will continue to rise in Africa. The rest of the world is projected to remain relatively stable.

Figure 2.1. Total population by major area, 1950-2100

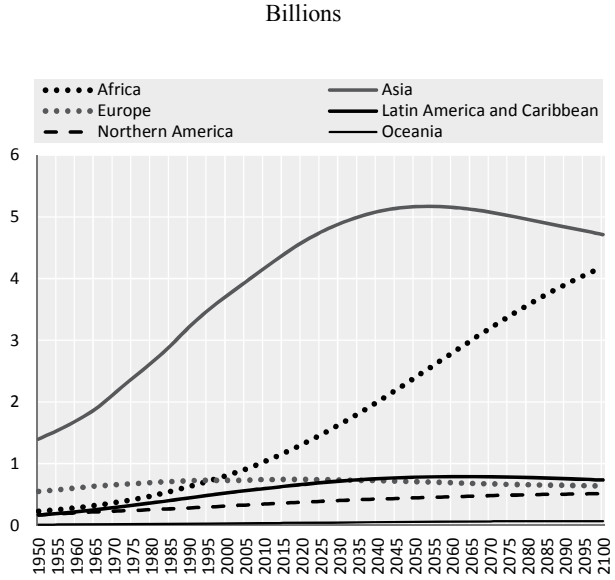
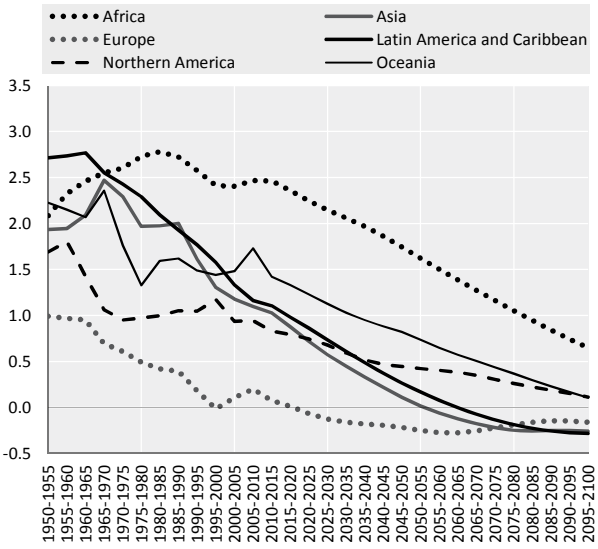


Figure 2.2. Average annual rate of population change, 1950-2100



Note: The United Nations defined area for Europe consists of 48 countries, and includes the Russian Federation.

Source: United Nations (2013), "World Population Prospects – The 2012 Revision: Key Findings and Advance Tables", United Nations, New York, www.un.org/en/development/desa/publications/world-population-prospects-the-2012-revision.html, accessed 4 April 2014.

In stark contrast to most of the 20th century, the 21st will be the century of population ageing

The number of people over the age of 60 will triple and 49 countries around the world will in fact shrink, most of them OECD and EU member countries (United Nations, 2011).[8] Figure 2.3 presents trends in median age by major region. It illustrates the global rise in the median age due to the interaction of sustained levels of fertility with improvements in life expectancy (Toosi, 2005). On average, it will rise from 29 to 38 by 2050, but it will eventually reach 47 years in Europe.[9] Regional differences are indeed striking. Europe will be hit first (in fact, ageing has already begun taking its toll), but Asia, notably China, and to a lesser extent Africa will also be ageing rapidly. Europe will, however, be the only region of the world to observe a reversal of this trend in the current century, possibly as soon as 2040.

In 2010, there were around four people of working age for every one over 64 years on average in the OECD (see Figure 2.A1.1 in the annex). By 2025, the support ratio will reach 3, and to continue falling. In Europe in 2050 the support ratio will be half of what it was in 2007, when it was 25.2% (European Commission, 2009). Already in 2010, Germany, Italy and Japan had support ratios below 3.

Figure 2.4 complements this picture by depicting the population dynamics of youth cohorts by main regions of origin. While the rest of the world will experience stability in the size of the youngest cohorts in the longer term, the dramatic drop in China will be matched by the tremendous rise in the number of young persons in Africa, with the absolute number of individuals aged 15-24 catching up to the number in Asia by 2100. Such dramatic change and imbalance in the demographic structure across countries and regions is bound to generate migratory pressure both at regional and international levels.

Figure 2.3. Median age of the population, 1950-2100

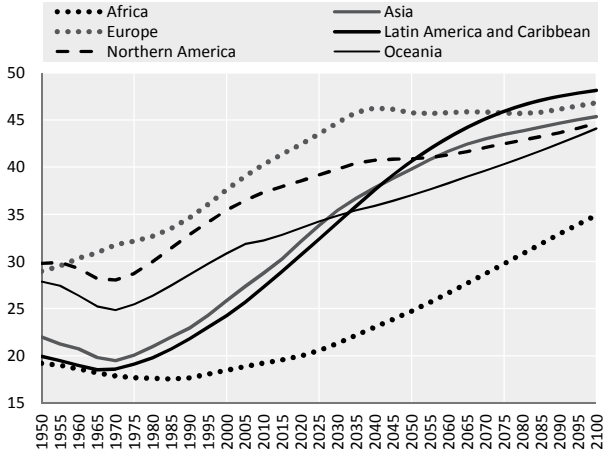
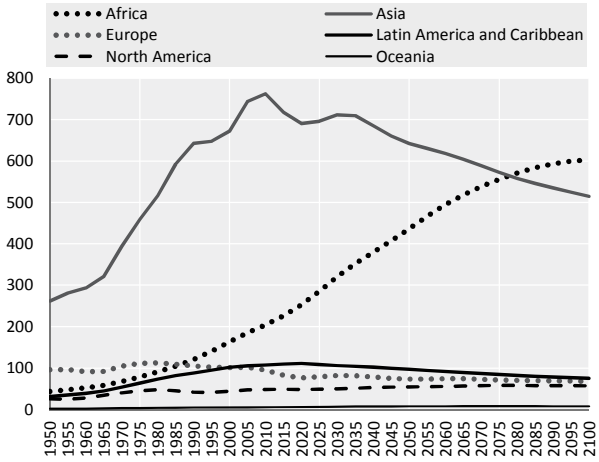


Figure 2.4. Population aged 15-24, 1950-2100

Thousands



Source: United Nations (2013), "World Population Prospects – The 2012 Revision: Key Findings and Advance Tables", United Nations, New York, www.un.org/en/development/desa/publications/world-population-prospects-the-2012-revision.html, accessed 4 April 2014.

2.4. Recent trends in working-age population in the EU27 and other OECD countries

Because people are living longer, the impact of population ageing in most countries will be noticeable on the size of the working-age population well before any effect can be identified on the overall size of the population.

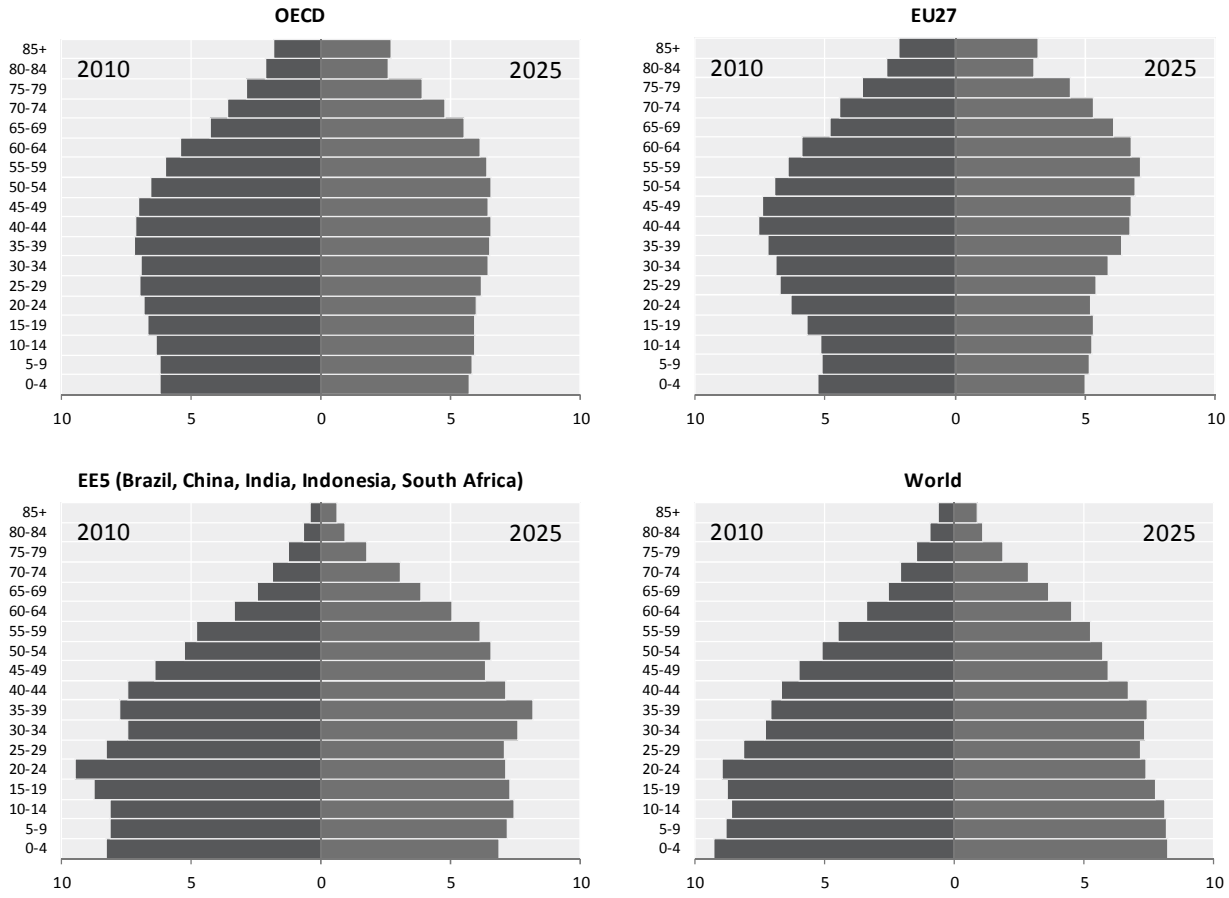
From the mid-1950s, many countries underwent a period of high fertility which eventually faded by the mid-1960s, leaving a bulge in the demographic structure. This bulge carried through the population pyramid over the years and generated a (demographic) dividend,[10] helping to spur growth in many OECD countries. By 2010, the so-called "baby-boomers" began exiting the working-age population, and the size of the group aged 15-64 began to shrink.

Figure 2.5 shows population pyramids for 2010 and the estimated values for 2025. It illustrates the upward movement of the median age of the working-age population, which is particularly striking in Europe. By 2025, the largest age group in the European Union will be aged 55 to 59, compared to 40 to 44 on average for the OECD and to 35 to 39 in large emerging economies. Furthermore, as the bulkiest groups of ages move upward, cohorts exiting the working age are being replaced by relatively smaller entering cohorts. Large emerging economies are moving in the same direction, although they are still many years away from the situation of European countries. China is perhaps the only exception.

The perspective of the end of the Chinese demographic dividend has already raised concerns on long-term sustainability of economic growth (Fang, 2011).

Figure 2.5. Population pyramids, 2010 vs. 2025

Share of total population in percentages



Source: United Nations (2013), "World Population Prospects – The 2012 Revision: Key Findings and Advance Tables", United Nations, New York, www.un.org/en/development/desa/publications/world-population-prospects-the-2012-revision.html, accessed 4 April 2014.

Table 2.1 below presents the size of the 15-64 age group for OECD, EU27 and selected emerging economies in 2010 as well as projections by the United Nations and EUROPOP for 2020.[11] The table also shows the projected net migration for the group aged 15-64 (see Box 2.1).

Table 2.1. Projection of working-age population in EU27, other OECD countries and large emerging economies, 2010-20

Thousands

	15-64 population in 2010	Projected ten-year 15-64 net migrant total	Projected 15-64 population in 2020	15-64 population in 2010	Projected ten-year 15-64 net migrant total	Projected 15-64 population in 2020
Source	WPP	WPP	WPP	EUROPOP	EUROPOP	EUROPOP
Australia	15 046	1 147	16 224			
Austria	5 681	172	5 658	5 654	228	5 698
Belgium	7 038	155	6 931	7 148	451	7 357
Brazil	131 679	- 352	146 583			
Bulgaria	5 153	- 88	4 530	5 212	- 105	4 575
Canada	23 630	1 580	24 287			
Chile	11 745	49	12 638			
China	970 532	- 2 841	988 938			
Cyprus[1,2]	780	56	847	563	31	587
Czech Republic	7 465	188	6 932	7 414	271	6 991
Denmark	3 637	98	3 619	3 631	94	3 614
Estonia	905	2	844	909	- 5	843
Finland	3 553	67	3 355	3 553	111	3 405
France	40 713	894	40 591	41 967	733	41 832
Germany	54 435	551	51 678	53 878	708	51 547
Greece	7 597	273	7 467	7 540	289	7 405
Hungary	6 866	132	6 425	6 874	197	6 518
Iceland	215	7	229	213	- 16	204
India	789 750	- 1 989	923 050			
Indonesia	161 699	- 1 702	182 607			
Ireland	3 001	83	3 177	3 008	- 69	3 045
Israel	4 625	63	5 209			
Italy	39 713	1 403	38 796	39 656	2 962	40 341
Japan	80 926	471	73 461			
Korea	34 896	- 56	34 832			
Latvia	1 539	- 14	1 410	1 549	- 20	1 413
Lithuania	2 296	- 41	2 130	2 295	- 84	2 106
Luxembourg	347	43	390	343	44	388
Malta	296	10	284	287	- 2	268
Mexico	73 215	- 2 379	83 968			
Netherlands	11 129	77	10 897	11 124	225	11 030
New Zealand	2 905	104	3 067			
Norway	3 252	114	3 329	3 218	235	3 436
Poland	27 406	19	25 362	27 223	138	25 540
Portugal	7 147	146	6 984	7 120	231	7 055
Romania	15 017	- 66	14 135	15 004	40	14 235
Russian Federation	103 161	1 405	95 209			
Slovak Republic	3 976	34	3 795	3 928	88	3 808
Slovenia	1 413	40	1 339	1 421	75	1 393
South Africa	32 704	- 500	34 759			
Spain	31 364	1 667	31 926	31 371	1 306	31 640
Sweden	6 118	242	6 083	6 100	367	6 196
Switzerland	5 216	161	5 171	5 296	499	5 589
Turkey	49 224	- 30	55 719			
United Kingdom	40 973	1 850	41 855	41 001	1 761	41 843
United States	207 534	8 037	215 628			
EE5	**2 086 363**	**- 7 384**	**2 275 937**			
EU27	**335 556**	**7 992**	**327 440**	**335 772**	**10 065**	**330 672**
EU15	262 444	7 722	259 407	263 093	9 442	262 395
EU12	73 112	270	68 033	72 679	623	68 277
EFTA+EU27	344 240	8 274	336 169	344 499	10 783	339 902
OECD	**822 904**	**17 406**	**837 866**			

WPP: UN World Population Prospects.

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

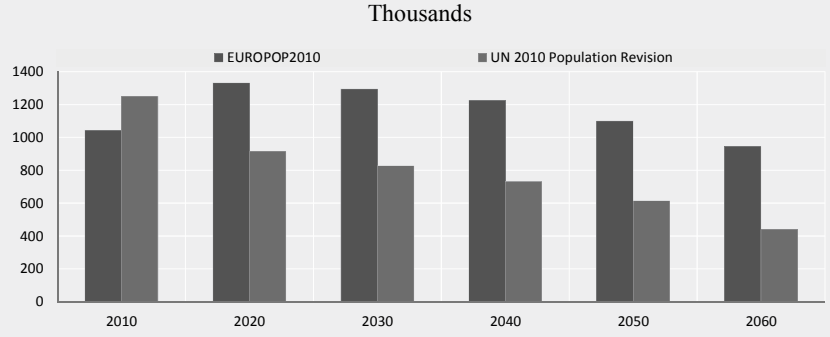
Source: United Nations (2011), "World Population Prospects – The 2010 Revision: Highlights and Advance Tables", United Nations, New York, www.un.org/en/development/desa/publications/world-population-prospects-the-2010-revision.html, accessed 22 May 2013; and EUROPOP2010.

Box 2.1. Projecting future migration flows

Of the three primary components of population change – fertility, mortality and migration – migration is certainly the hardest to predict (Toossi, 2005). Projecting migration requires a good understanding of its determinants, which itself requires a capacity to predict economic cycles or hazard (e.g. war, natural disaster). The fall of the iron curtain, the wars in ex-Yugoslavia or the earthquake in Haiti were all largely unforecastable events that have had a significant impact on migration flows. The same could be said about the great recession which hit OECD countries in 2007/08.

Most recent UNPD projections presented in the World Population Prospects (2010 Revision) identify two migration scenarios. Under the normal migration assumption, the future path of international migration is set on the basis of past international migration estimates and consideration of the policy stance of each country with regard to future international migration flows. Projected levels of net migration are generally kept constant over the next decades. After 2050, it is assumed that net migration will gradually decline. There is also an alternative zero-migration assumption under which, for each country, international migration is set to zero starting in 2010. As shown in the figure below, UN projections for net migration depart significantly from those of EUROPOP2010 for the EU27. UN projections tend to anticipate a much steeper decline in net migration between 2010 and 2020.

Projection for net migration for total population in the EU27



Note: UN estimates refer to the ten-years average before the reference year (i.e. 2005-15 for 2010).

Source: United Nations (2011), "World Population Prospects – The 2010 Revision: Highlights and Advance Tables", United Nations, New York, www.un.org/en/development/desa/publications/world-population-prospects-the-2010-revision.html, accessed 22 May 2013; and EUROPOP2010.

The figures presented in this chapter are based on net migration flows extracted from the World Population Prospects 2010 data for all non-European OECD countries and non-OECD countries (normal migration assumption) and from the Eurostat Population Projections 2010 (EUROPOP2010) for European countries. Net migration for the group aged 15-64 is calculated by difference between the variation of the population 15-64 between 2010 and 2020 with and without migration.

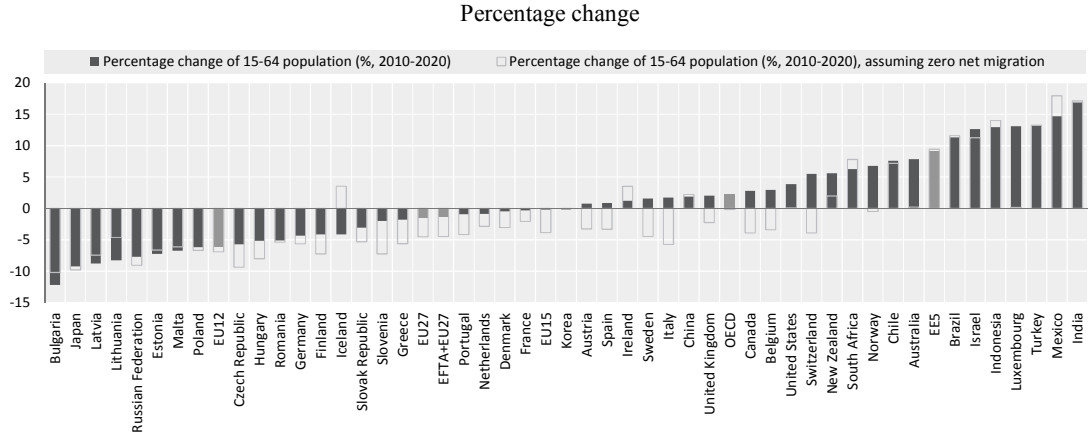
According to these projections, while the working-age population is expected to shrink by 2020 in the EU27 and grow only modestly in the OECD, the population of large emerging countries will – in contrast – continue growing fast, averaging 9% over the period. The only country in this group where the working-age population will begin slowing in growth is China, where labour force growth will be limited to 2% between 2010 and 2020. In the EU27, most of the decline will come from the 12 EU accession countries, where working-age population will decline by approximately 6%. In contrast the 15-64 population in the EU15 will remain more or less stable.

As far as the EU27 is concerned, according to projections by EUROPOP2010 without migration working-age population will decline by more than 15 million by 2020 (84 million by 2050). Germany, Italy, Poland and Spain are expected to lose more than 1 million people of working age each by 2020 without considering migration flows.

Similar trends are observed in Japan (-8 million), the Russian Federation (-9.4 million) and to a lesser extent Canada (-1 million). In the United States and Australia, working-age population will maintain itself at least until 2020 without net migration inflow. Inversely, countries such as Chile (+0.8 million), Mexico (+13 million) and Turkey (+6.5 million) as well as Brazil (+15 million), India (+135 million), Indonesia (+22 million) and South Africa (+2.5 million) will continue to experience rapid increase of their working-age population and net outmigration over the next decade.

Taking into account net migration of people in working age, only slightly changes the overall picture (Figure 2.6). Within the EU27, only Belgium, the United Kingdom, Italy, Sweden and Ireland are expected to experience an increase in their working-age population by 2020. In the case of Spain, however, the projection relies on optimistic positive net migration (+130 000 per year between 2010 and 2020) that would require revision in light of the recent economic crisis (net migration was actually negative for the first time in 30 years in 2011, with an estimated outflow of 50 000 people). Similarly, net migration figures for Italy (approximately +350 000 per year between 2010 and 2020) seems high in comparison to recent trends (250 000 in 2011; i.e. half of what was recorded in 2007).

Figure 2.6. Variation in the working-age population between 2010 and 2020 in OECD countries and selected emerging economies



EE5: Enhanced Engagement Countries: Brazil, China, India, Indonesia, South Africa.

Source: United Nations (2011), "World Population Prospects – The 2010 Revision: Highlights and Advance Tables", United Nations, New York, www.un.org/en/development/desa/publications/world-population-prospects-the-2010-revision.html, accessed 22 May 2013; and EUROPOP2010.

In the case of Bulgaria and Lithuania taking into account migration significantly worsens the picture as net outflows are anticipated for these countries during the next decade. Bulgaria stands out with an expected decline of its working-age population of almost 13% but the working-age population is also supposed to decline by more than 9% in Japan, 8.8% in Latvia, 8.3% in Lithuania and 7.7% in the Russian Federation. On average in the OECD, the working-age population is nonetheless due to increase (by 2.2%) over the next ten years.

Projecting beyond the 2020 timeline, population ageing stabilises in some countries, while it accelerates in others

Eventually, the ageing process will also accelerate in many countries of the global South (Pison, 2009). China has already reached its own particular "jagged" ageing

process (Haub, 2012). India's population of the elderly will also increase dramatically over the next four decades (PRB, 2012). In fact, by 2025, the developing world will be home to over 70% of the world's elderly (United Nations, 2005).

Looking solely at the change in the projected size of the working-age population slightly misses the point however. Not everyone in the working-age population is working or looking for a job. To get a sense of the real urgency in terms of labour needs, a deeper look at participation rates by age group is needed.

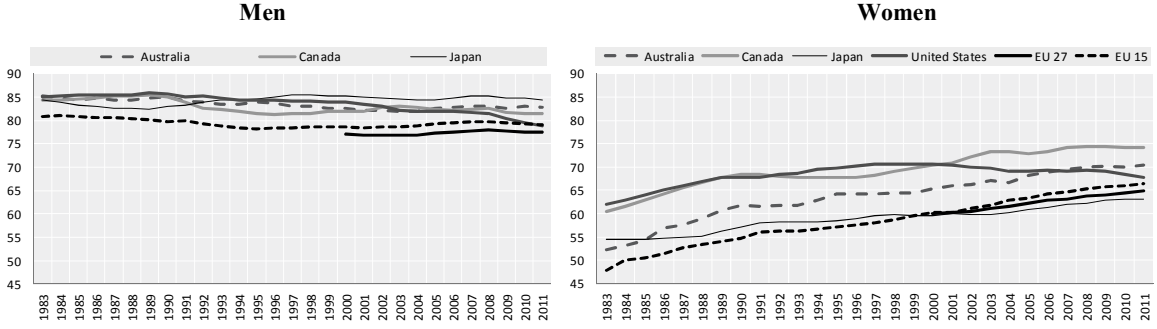
2.5. The labour force: Demographic vs. cohort effects

The labour force tends to be more elastic than we give it credit for, and it constantly adjusts to prevailing economic conditions and structural changes

Figure 2.7 illustrates long-term evolutions of labour force participation by gender for selected OECD countries. A number of patterns emerge from these graphs. First of all, labour force participation in the European Union appears to be significantly lower than in other OECD countries. This may be explained by a stronger *discouraged worker effect* in response to higher structural unemployment but can also be explained by large differences in the age structure of the working-age population.

Figure 2.7. Labour force participation (15-64) by gender in selected OECD countries and the EU27, 1983-2011

Percentages



Source: OECD.stat for all countries, except for EU27: Eurostat.

In the United States and to a lesser extent in Canada and Australia, a decline in the labour force participation of men has been observed since the early 1990s. Participation rates of women have been gradually increasing since the 1990s in most OECD countries, except in the United States where it has declined rapidly since the early 2000s. Progress is particularly marked in Australia but also in the European Union.

Lastly, the gender gap in participation rates has not been closed yet in the EU27, or in other OECD countries. Differences by gender remain large, notably in Japan where they reach 20 percentage points. According to recent OECD estimates (OECD, 2012a), a 50% decrease in the gender gap in labour force participation by 2030 would bring a 6% gain in GDP and a 0.3 percentage point increase in the *average annual growth rate of GDP per capita.*

Taking into account differences in labour force participation by gender and age, the evolution of the labour force might be quite different from that of the working-age population. Projections of the economically active population by demographic group are available from the ILO for the period 2010-20. These projections take into consideration previous demographic trends, including the proportion of immigrants in the country, gender, age as well as demographic evolution (see Box 2.2).

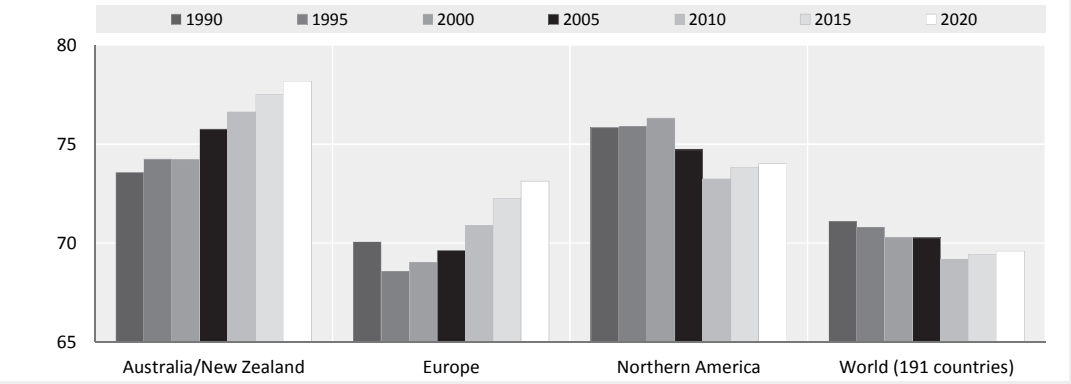
Box 2.2. ILO projections of economically active population

Important elements in the projection of participation rates, albeit a difficult one to predict, are related to societal and economic changes. It implies anticipating variations in tastes and preferences for leisure which cannot (easily) be predicted (Katagiri, 2012). It is also contingent on structural change in the economy, through occupational and industrial change as well as to institutional changes. Although labour force projections generally ignore short-term cyclical fluctuations, such changes can sometimes turn into structural ones. This would be the case, for instance, if an economic downturn prematurely pushed a substantial number of older workers out of the labour force permanently.

The figure below presents ILO estimations and projections of the evolution of participation rates for population 15-64 for selected regions of the world, depicting an overall positive trend at least since 2010.

ILO estimated and projected participation rates (15-64) by selected regions, 1990-2020

Percentages



Source: ILO (2011), "ILO Estimates and Projections of the Economically Active Population: 1990-2020 (Sixth Edition)", Geneva, October; and OIT (2011), *Economically Active Population Estimates and Projections Database* (http://laborsta.ilo.org/applv8/data/EAPEP/eapep_E.html).

ILO projections of the economically active population between 2010 and 2020 (sixth edition) are derived from a three-step procedure that uses both a mechanic approach and professional judgment.

The first step consists of applying six models to each time series of labour force participation rates for a given country, age group and gender. In the next step, the projections obtained from the six models are combined using a weighted average. In the third step, the combined projections are adjusted using judgment in order to obtain consistent labour force participation rates.

The different steps of this methodology have been tested and implemented on the basis of ex-ante and ex-post experiments. Ex-ante tests (before the action) consist of comparing the results obtained by this methodology with the projections published recently by NSOs. Ex-post (after the action) experiments consist of dropping the last observations of a time series, then deriving projections on the basis of the shortened time series and calculating and analysing the ex-post (also called "post-sample") error projections.

ILO projections suggest a general increase in the participation rate by 2020; both the OECD and the EU27 are slated to have rates above 73% by then. This forecast would mean falling short of the EU's objective of a 75% employment-to-population ratio by 2020. At current unemployment rates in the EU27, a 73% participation rate would equate to a 65% employment-to-population ratio, 10 percentage points short of the target.

a. It should be noted, however, that the EU's 75% objective refers to the 20-64 rather than the 15-64 age group.

b. According to Eurostat, the unemployment rate in the EU27 was 10.9% in March 2013.

Changes over time in aggregate participation rates are the result of two somewhat independent factors. Firstly, the fact that older cohorts tend to have lower participation rates than younger ones. All other things being equal, the increase in the median age of the working-age population will therefore tend to accelerate the decline in the size labour force. Secondly, the trend in participation rates at all ages tends to be upward, except in the United States. That is, new cohorts generally have higher participation rates than did their predecessors when they were the same age. This counterbalancing effect will partially offset the negative impact mentioned above.

How much will the age structure impact the labour force by 2020?

Table 2.2 compares the size of the labour force projected in 2020 given the same age-specific participation rates as 2010 with the size of the labour force in 2020 as projected by the ILO's EAPEP database. This projects a "what-if" scenario by keeping everything constant in 2010 and only letting demography take its course to 2020. These are crude calculations as they mix men and women, as well as native-born and foreign-born participation rates.

The table shows that the general rise in participation rates equates to projections on labour force sizes that are not as bleak as population projections indicated previously in Figure 2.7. The foreseen increase in labour force participation is a major determinant of future labour force growth. In the EU27, on average, labour forces will be higher by nearly 3% than they otherwise would have been with constant participation rates.

In fact, apart from the EU12 countries, Germany and Japan, other OECD and EU15 countries will have constant or growing labour forces on average over the 2010-20 decade. The labour force will increase in the United States and the United Kingdom by around 5%, while the increase will be as high as 11.5% in Ireland and 16.0% in Luxembourg. On average over the next ten years, the total labour force will increase by 4% in the OECD.

There is no guarantee, however, that recent improvements observed in terms of labour force participation will continue in the longer-term. The OECD has recently estimated that with unchanged policies, high-income countries would experience an average fall of 5 percentage points in the participation rate (15+) by 2060 (Johansson et al., 2013). If policies are implemented to maintain "*active life expectancy*" constant and if the long-term trend expansion of educational attainment continues, the aggregated OECD labour force participation rate is estimated to stay roughly constant. It will still fall in countries such as Poland, Korea, Portugal, Japan and Slovenia but will increase significantly in Chile, Estonia, Mexico and the United States.

Entering and exiting cohorts do not only differ according to their size and inclusion in the labour market but also have marked differences in terms of preferences, educational backgrounds and skills for instance. This raises further challenges in terms of matching supply and demand of labour over time which go well beyond a demographic count. The next section looks at this question in greater detail.

Table 2.2. Projected percentage change in labour force by country between 2010 and 2020, depending on the assumption on the evolution of participation rates

Percentages

	Accounting for projected evolution in labour force participation	Without accounting for projected evolution in labour force participation
Australia	9.9	7.8
Austria	-0.2	-0.4
Belgium	0.2	-1.5
Brazil	12.8	11.3
Bulgaria	-7.1	-12.1
Canada	6.2	2.8
Chile	12.0	7.6
China	1.5	1.9
Cyprus[1,2]	14.1	8.6
Czech Republic	0.8	-7.1
Denmark	1.6	-0.5
Estonia	-3.5	-6.7
Finland	-2.1	-5.6
France	2.0	-0.3
Germany	-4.7	-5.1
Greece	1.5	-1.7
Hungary	-1.6	-6.4
Iceland	10.9	6.5
India	17.2	16.9
Indonesia	13.2	12.9
Ireland	11.5	5.9
Israel	14.1	12.6
Italy	1.0	-2.3
Japan	-7.2	-9.2
Korea	2.0	-0.2
Latvia	-3.1	-8.4
Lithuania	-2.0	-7.2
Luxembourg	16.0	12.3
Malta	1.5	-3.9
Mexico	18.6	14.7
Netherlands	1.3	-2.1
New Zealand	8.2	5.6
Norway	6.9	2.4
Poland	-3.5	-7.5
Portugal	-0.5	-2.3
Romania	-0.3	-5.9
Russian Federation	-5.0	-7.7
Slovak Republic	1.8	-4.6
Slovenia	-3.2	-5.3
South Africa	13.3	6.3
Spain	2.7	1.8
Sweden	3.3	-0.6
Switzerland	0.1	-0.9
Turkey	14.2	13.2
United Kingdom	5.4	2.2
United States	4.7	3.9
EE5 average	**8.2**	**8.1**
EU27 average	**1.2**	**-1.5**
EU15 average	1.8	-0.3
EU12 average	-1.0	-6.1
EFTA+EU27 average	1.4	-1.3
OECD average	**4.0**	**1.9**

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: ILO Economically Active Population, Estimates and Projections, 2011 Revision.

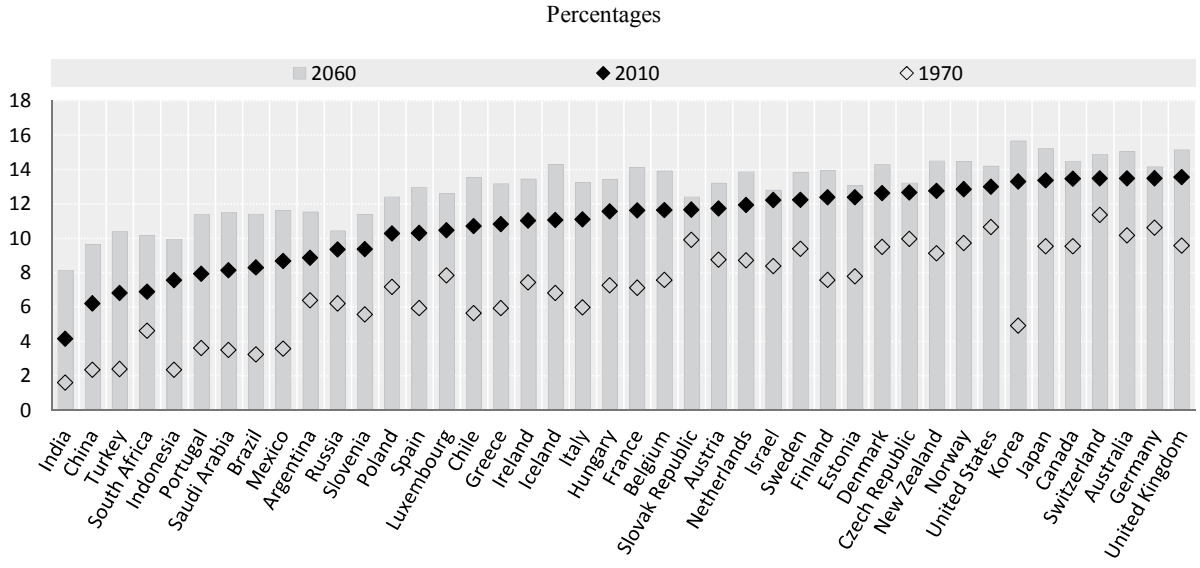
2.6. Beyond participation: Skills and geographical mismatches

The consequences of population ageing in the labour market go well beyond a simple population count, notably due to differences in terms of educational attainment between entering and exiting cohorts

Coomans (2011) shows for example that on average in the EU27, 19% of workers aged 55 to 64 are tertiary educated (38% are low-educated) compared with 33% for young workers aged 25 to 34 (19% are low educated).

Overall, the OECD estimates that the average number of years of schooling of the adult population will continue to increase in most countries as shown in Figure 2.8. It is projected to increase by two years on average over the next 50 years, with attainment of cohorts aged 25-29 slowly converging towards that of Korea (Johansson et al., 2013). Gains are nonetheless expected to be much smaller than during past decades, except for large emerging economies such as China and India. These countries will still, however, lag behind high-income OECD countries in 2060 in relative terms.

Figure 2.8. Evolution of average number of years of schooling of the adult population in OECD countries, 1970, 2010, 2060



Source: Johansson, Å. et al. (2013), "Long-Term Growth Scenarios", *OECD Economics Department Working Papers*, No. 1000, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k4ddxpr2fmr-en.

Skill and education mismatches are difficult to anticipate as they depend on the evolution of the demand for skills. Handel (2011) has recently showed that while there is no strong evidence of an acceleration in recent decades there is a generally a steady and continuous process of skill upgrading. This evolution needs to be supported by appropriate education, training and social policies. The EU Skills Panorama (http://euskillspanorama.ec.europa.eu/) is a significant step forward in informing skills governance and enhancing the matching of supply and demand for labour across Europe.

Geographical mobility is a key policy instrument to deal with skill mismatches, and one which has considerable potential notably in Europe.[12] Despite a downward trend, internal migration within the United States remains higher than it is within most other

developed countries or regions (Malloy et al., 2011). In Western Europe, it is still about half of what it is in the United States. Peschner (2011), for instance, highlights geographic differences in employment rates *within* European countries. In addition, skill shortages coexist with areas of persistent high unemployment. He suggests that for Europe to reach its employment goals, it needs to look beyond national aggregates and rather aim for a 75% employment rate at regional level. The fact that younger cohorts tend to be more mobile than older ones, as well as the fact that they are more accustomed and better prepared for mobility, provides hope that this adjustment mechanism will play a greater role in the future. The recent EC directive proposal on *measures facilitating the exercise of rights conferred on workers in the context of freedom of movement for workers* (European Commission, 2013) should support this evolution.

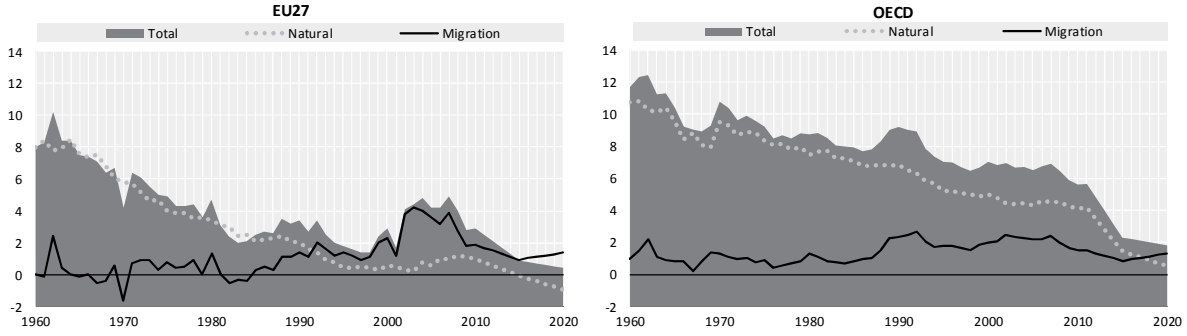
2.7. What role does international migration play?

International migration largely contributed to population growth over the past two decades

This is the case for the European Union as a whole where the net migration rate largely dominates natural population increase but this is also true for the OECD area where migration tends to make an increasing contribution to population growth at least in relative terms, apart from the period starting in 2008/09 (see Figure 2.9).

Figure 2.9. Components of total population growth in OECD countries, 1960-2020

Per thousand inhabitants



Source: 1980-2011: United Nations (2011), "World Population Prospects – The 2010 Revision: Highlights and Advance Tables", United Nations, New York, www.un.org/en/development/desa/publications/world-population-prospects-the-2010-revision.html, accessed 22 May 2013; 2012-20: extrapolations based on United Nations Population Prospects Database 2010.

These aggregates hide a large diversity of situation across countries, as shown in Figure 2.A1.2. In Australia, Austria, Canada, Luxembourg, Norway and to a lesser extent in Belgium, Denmark, Sweden and Switzerland, international migration is driving population growth. The same type of situation was observed before the great recession in countries such as Czech Republic, Spain, Greece and Italy, where changes in the economic climate have reversed this trend in the past few years.

In contrast, migration actually plays a rather limited role on population dynamics in some longstanding immigration countries such as the United States, France, the Netherlands and New Zealand. This is also the case for many Central and Eastern European countries including Slovenia and the Slovak Republic.

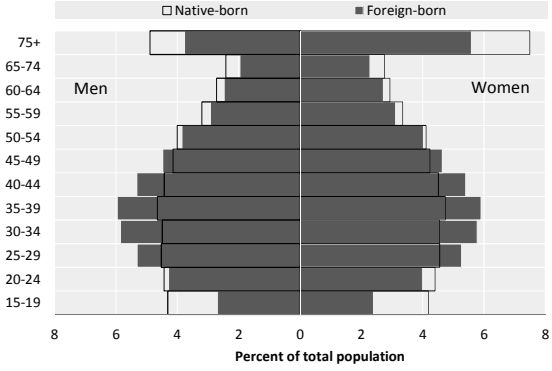
Projection for net migration by 2020 in the EU27 and the OECD are based, however, on rather optimistic assumptions which would imply a reversal in the declining trend in around 2016/17. Under these hypotheses the role of migration in total population growth will increase drastically in most OECD countries and notably in Europe.

The contribution of migration to the working-age population and the labour force depends not only on the size of migration flows, but also on the age structure of the migrant population

As shown in Figure 2.10, the age structure of total foreign-born population in the OECD differs significantly from that of the native-born population as migrants tend to be under-represented in younger age groups (15-24) and among older people. More than half of the total increase in the migrant population between 2000 and 2005/06 was indeed attributable to migrants aged 25 to 49. Figure 2.A1.3 presents more detailed population pyramids for recent migrants in Europe and in the United States. It highlights the fact that most migrants arrive during the most productive years of their life, notably in Europe where 22% migrants arrived between 2006 and 2011 are between 25 and 29 years old (53% are aged between 25 and 39 years old).

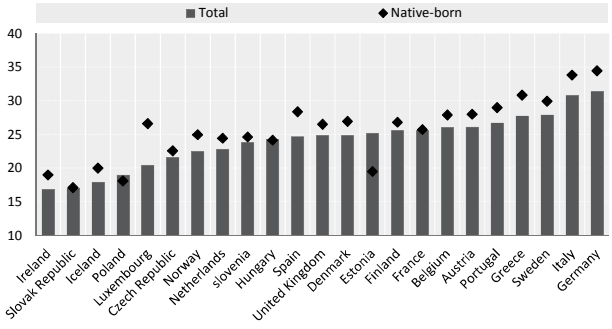
Migration also affects old-age dependency ratios. This is the case in most OECD countries (Figure 2.11), apart from France, where recent flows have been very limited, and in Central and Eastern European countries. The impact of migration seems, however, modest in comparison to the scope of population ageing in Europe. Furthermore, unless there would be a continuous and increasing inflow of new immigrants, the impact of migration on the age structure of the resident population would only be transitory as migrants also age.

Figure 2.10. Age structure of the population aged 15 and over in OECD countries by gender and place of birth, 2005/06



Source: Widmaier, S. and J.C. Dumont (2011), "Are Recent Immigrants Different? A New Profile of Immigrants in the OECD (DIOC 2005/2006)", *OECD Social, Employment and Migration Working Papers*, No. 126, OECD Publishing, Paris, http://dx.doi.org/10.1787/5kg3ml17nps4-en.

Figure 2.11. Old-age dependency ratio for total and native-born population in selected OECD countries, 2010



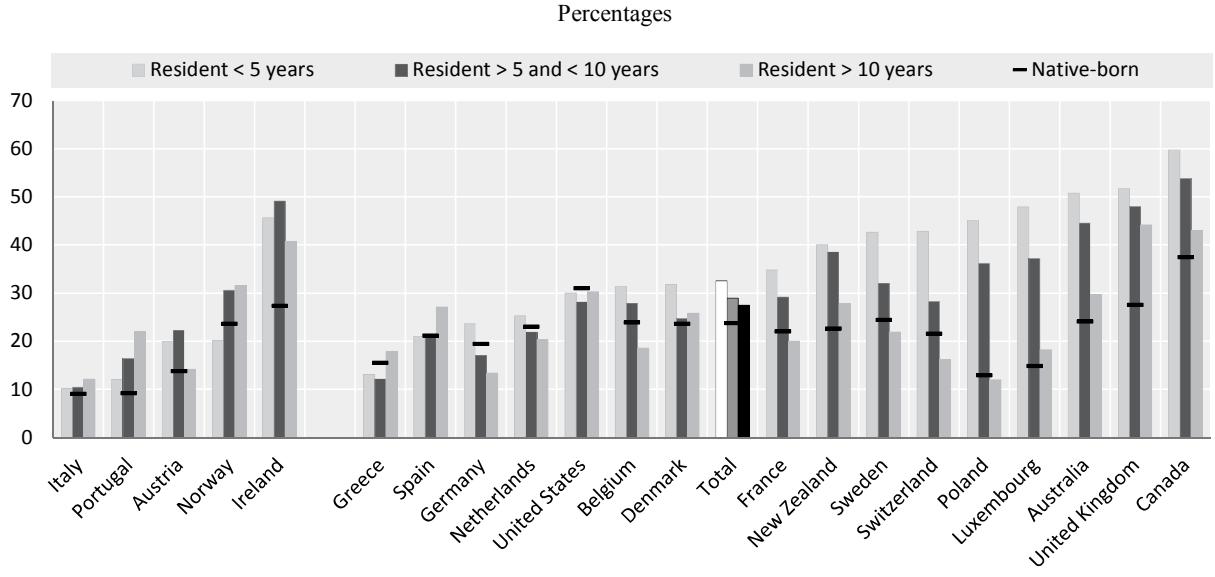
Note: Old-age dependency ratio in the total population and native population, where the difference between the two represents the contribution of foreign-born population.

Source: Johansson, Å. et al. (2013), "Long-Term Growth Scenarios", *OECD Economics Department Working Papers*, No. 1000, OECD Publishing, Paris, http://dx.doi.org/10.1787/5k4ddxpr2fmr-en.

Immigrants also make a large contribution to the stock of human capital in destination countries

OECD countries are competing to attract (and retain) high-educated immigrants, notably in R&D and ICT sectors to foster innovation capacity, but also in health or education sectors. These recruitments are generally facilitated for large multinational companies and many OECD countries have eased the conditions for international students to facilitate migrant status changes at the end of their studies. Between 2000 and 2005/06, the proportion of high-educated persons living in OECD countries increased by 3 percentage points for the native-born and by 5 percentage points for immigrants. Recent immigrants are indeed more highly educated than the resident population and previous cohorts of immigrants (Figure 2.12).

Figure 2.12. Share of high-educated among immigrants and native-born, aged 15 and over, by duration of stay in selected OECD countries, 2005/06



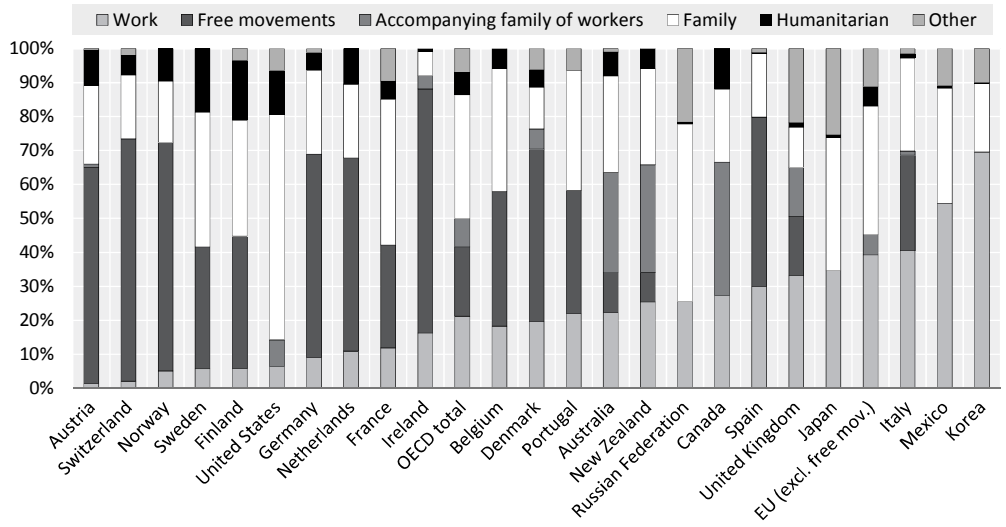
Source: Widmaier, S. and J.C. Dumont (2011), "Are Recent Immigrants Different? A New Profile of Immigrants in the OECD (DIOC 2005/2006)", *OECD Social, Employment and Migration Working Papers*, No. 126, OECD Publishing, Paris, http://dx.doi.org/10.1787/5kg3ml17nps4-en.

The contribution of migration to the labour force varies by entry category.

Labour migrants, by definition, contribute directly to the increase of the labour force, although they usually only represent a small share of total movements (Figure 2.13). Overall, labour migration accounts for approximately 20% of total permanent movements to the OECD. A large part of new migration in the EU area is actually free mobility within the European Union, which contributes to the labour market as well but which – in demographic terms – is a zero-sum game for the area as a whole. Family migration continues to be the main category of entry, accounting for more than 35% of the flows (45% if including the accompanying family of labour migrants).

Figure 2.13. Permanent inflows into selected OECD countries, by category of entry, 2010

Percentages



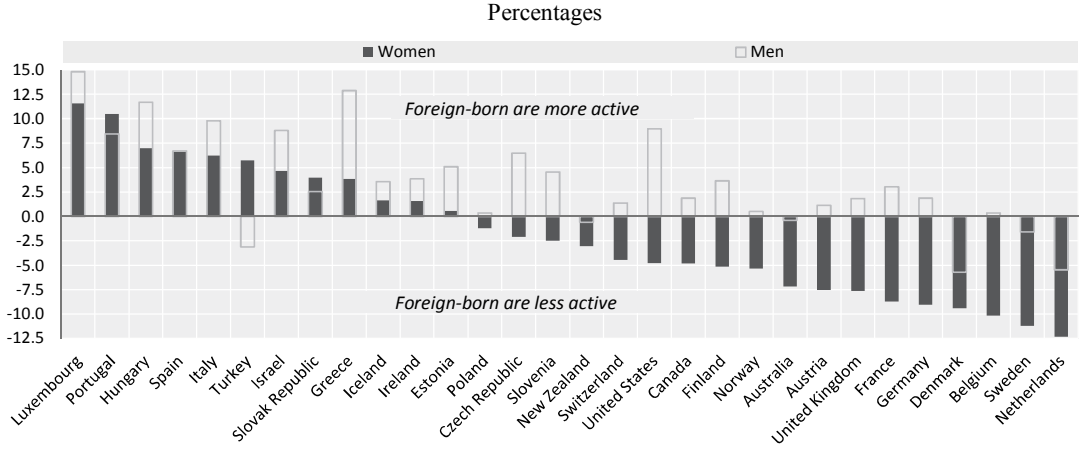
Source: OECD (2012), *International Migration Outlook 2012*, OECD Publishing, Paris, http://dx.doi.org/10.1787/migr_outlook-2012-en.

One way to increase the contribution of migrants to the labour force would be to foster the labour market participation of current immigrants already in the country

While participation rates of foreign-born men compare favourably with those of their native-born counterparts in most countries, Denmark and the Netherlands being the two most notable exceptions, this is not true for women (Figure 2.14).

Figure 2.14. Participation rates (15-64) by gender and place of birth in selected OECD countries, 2012

Percentages



Source: European countries: Labour Force Survey 2012 (Eurostat); United States: Current Population Survey 2012; Australia, Canada, New Zealand: Labour Force Surveys 2012; Israel: Labour Force Survey 2011.

The participation rate of migrant men is over 85% in Switzerland, Greece, Portugal, Spain and the United States (Figure 2.A1.4). The gap with the native-born is over

10 percentage points in Luxembourg, Greece and Hungary. These positive results do not mean, however, that participation of migrant men could not be further improved as the above results are partly due to a younger age structure in the working-age immigrant population compared with the native-born.

The labour market integration of migrant women is certainly less propitious, notably in the EU15 but also in the OECD settlement countries (e.g. Australia, the United States, Canada and to lesser extent New Zealand). The activation of migrant women represents an important potential labour force in Europe, especially in the Nordic countries, Belgium, Germany, France, the United Kingdom and Austria.

What are the potential gains in the size of the labour force from raising the participation rate of immigrants to the level observed for the native-born?

Table 2.3 explores this question by estimating the change in the size of the labour force which would result from identical participation rates for immigrants and natives of similar characteristics (gender, age group and educational attainment). This would generate a sizeable increase in the workforce in about half of the EU countries. The change would result in over 200 000 additional workers in Germany, the United Kingdom and France. Overall, for the European Union, it would generate as much as one million additional workers. In the United States, inversely, a change in the participation rates of foreign-born population would have virtually no impact.

Table 2.3. Change in the foreign-born active population if the foreign-born had the same participation rate as comparable (age, education, sex) natives, 2011 in selected European countries

	Foreign-born active population in 2011	Foreign-born active population in 2011 if participation rates identical to the natives'	Active population gain or loss of the change in the participation rates
Germany	6 560	6 910	350
United Kingdom	4 610	4 940	320
France	3 470	3 700	220
Netherlands	1 000	1 140	150
Sweden	800	900	100
Belgium	720	810	90
Switzerland	1 290	1 350	60
Austria	740	780	40
Denmark	250	280	30
Norway	280	300	20
Ireland	330	340	20
Finland	110	120	10
Czech Republic	160	160	0
Poland	40	50	0
Bulgaria	10	10	0
Estonia	90	90	0
Romania	10	10	0
Latvia	130	130	0
Lithuania	60	60	0
Hungary	90	90	0
Slovak Republic	10	10	0
Iceland	20	20	0
Slovenia	100	90	0
Luxembourg	120	120	0
Portugal	520	510	- 10
Greece	530	480	- 50
Spain	4 310	4 170	- 140
Italy	3 260	3 050	- 210
All European countries	**29 610**	**30 620**	**1 010**
EU-27 (all countries minus Switzerland) and national participation rates	**28 320**	**29 270**	**950**

Source: Labour Force Surveys (Eurostat).

2.8. Conclusion

The EU27 countries and Japan are facing demographic challenges which will impact them before, and much more severely, than other OECD countries. Large emerging economies still benefit from a large demographic dividend, although China for example is ageing very rapidly. Demographic trends are well known and have been intensively studied. The implications in terms of changes in the labour force are, however, less clear because it results from a combination of several conflicting effects associated to changes in the age structure of the working-age population and to structural trends in participation rates by gender, age and education level.

Our analysis shows that the demographic impact on the EU workforce could be somewhat attenuated by increasing participation rates, which will mitigate the reduction in the workforce at least until 2020 at current projected net migration levels.

EUROPOP2010 net migration projections are, however, quite optimistic. It would notably imply that Europe becomes significantly more attractive than the United States as a destination for permanent migration. Whether the assumptions are realistic or not remain to be seen but it would probably necessitate significant changes in current migration policies and/or a strong economic rebound. Hypotheses in term of evolution of participation rates would also need to backed-up by ambitious and efficient activation policies, including for migrants.

In the longer term, however, recalling that the population ageing process will not be reversed in Europe before at least 2040, it is unlikely that an increase in participation rates will be sufficient to maintain a constantly growing labour force in Europe. Furthermore, challenges associated to population ageing go beyond population counts and will reveal skill mismatches at both national and regional levels. In this context what can be the role of migration?

The chapter that international migration encompasses both opportunities and challenges when it comes to responding to population ageing. Because migrants tend to be concentrated in more active age groups, they bring-in valuable human resources to the workforce and may contribute to temporarily support fertility rates, but this type of demographic dividend vanishes quickly as migrants also age or leave.

Similarly, labour migration may grease the wheels of the labour market (Borjas, 2001) and can be an efficient instrument to respond to short-term labour and skills needs, notably at the regional level, but in the medium-term migrants' expectations also adjust and they tend to leave less attractive entry jobs to move forward to better opportunities.

International migration fosters the accumulation of human capital in OECD and EU countries and has a positive impact on economic growth but it will not be sufficient to address, on its own, structural demographic, labour market or fiscal challenges. This rather calls for a coherent and multidimensional policy response that looks at migration and mobility as one element in the context of a broader skill strategy to support long-term inclusive growth.

Notes

1. For medium-term scenario, see, for example OECD (2012c), ECB (2011), Peschner (2011); for a long term scenario see, for example, OECD (2012c), Fouré et al. (2011); see also OECD (1998).
2. See, for example, Cedefop (2010a, 2009), Eurofund (2010), European Commission (2008).
3. See, for example, European Commission (2012a), OECD (2012e).
4. See, for example, European Commission (2012b, 2009), OECD (2011a).
5. See, for example, Eurostat-EC (2011), OECD (2009), OECD (2003).
6. See for example Rabu (2010), Fargues (2011).
7. These figures include projections of migration levels and fertility (the UN's medium variant). Challenges related to projecting migration levels are discussed in Box 2.1.
8. Symbolically, the general discourse on ageing and employment in many OECD countries has gradually moved away from the benchmark age of 60 or 65 to older reference ages (generally 80), due not only to higher life expectancy but also the sheer relative number of people currently and slated to be in this group. See D'Albis and Collard (2012) for an interesting discussion on measures of population ageing.
9. According to Eurostat projections the median age will even reach 48 years in the EU27 by 2060 (European Commission, 2011).
10. "Demographic dividend" is the term used to describe cases where the productive labour force increases faster than the non-productive labour force, leading to a drop in the dependency ratio. The "dividend" refers to a time-bound benefit to the economy during which its productive capacity is boosted, up to the point where the bulge created in the country's demographic profile begins to retire.
11. These projections are based on UN's medium variant which reflects a medium fertility rate and a normal mortality rates. The medium fertility rate is the median of an estimated 100 000 trajectories, based on past rates and convergence assumptions. The normal mortality rate is estimated based on current life-expectancy.
12. Eurobarometer (2010) finds that 10% of respondents have lived and worked abroad and 13% have been abroad for education or training. Around a third of Europeans think that the chances of finding a job in another country is higher than in their own country and close to one in five (17%) envisages working abroad at some point in the future. See also Bonin et al. (2008).

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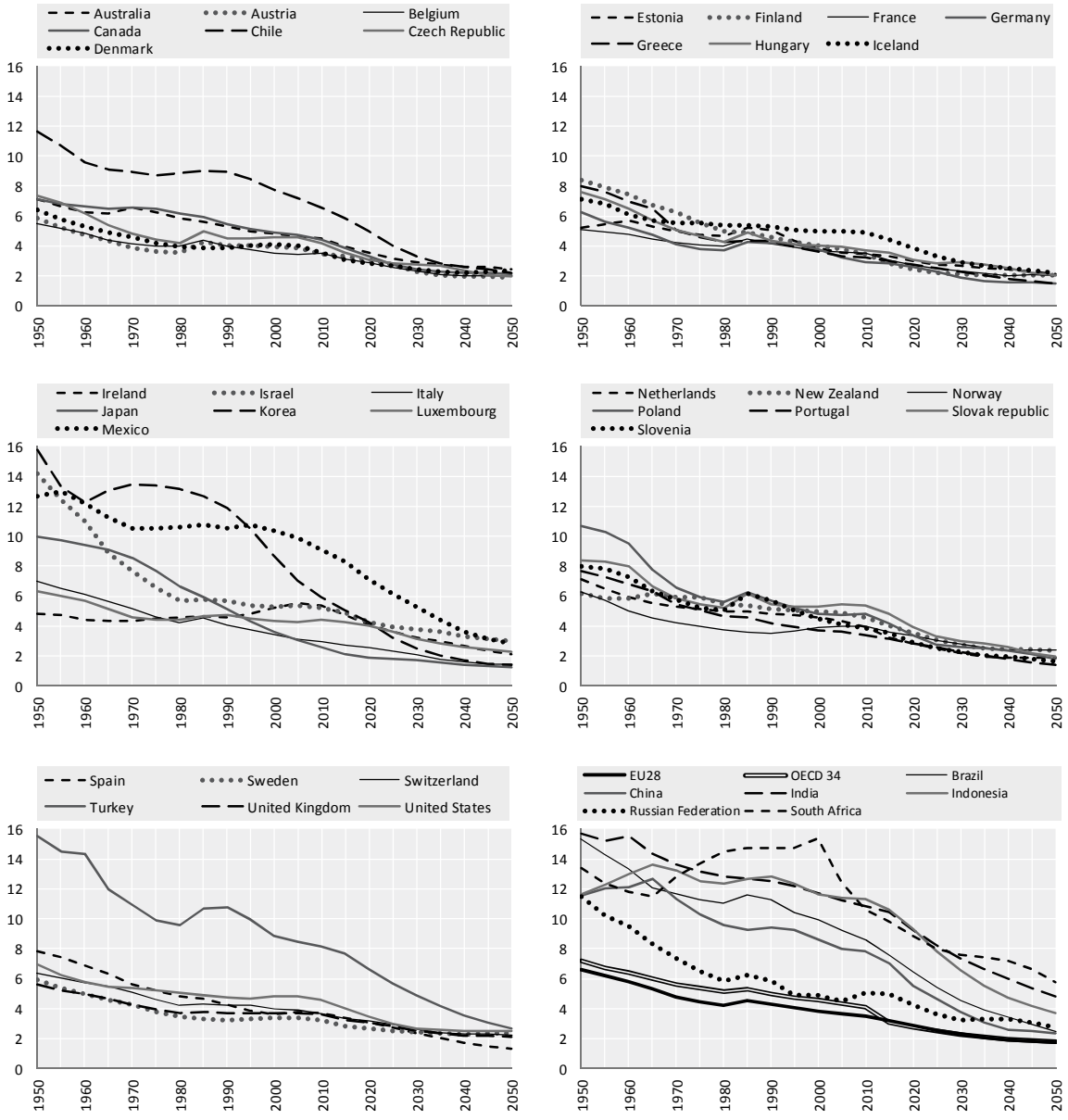
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Annex 2.A1

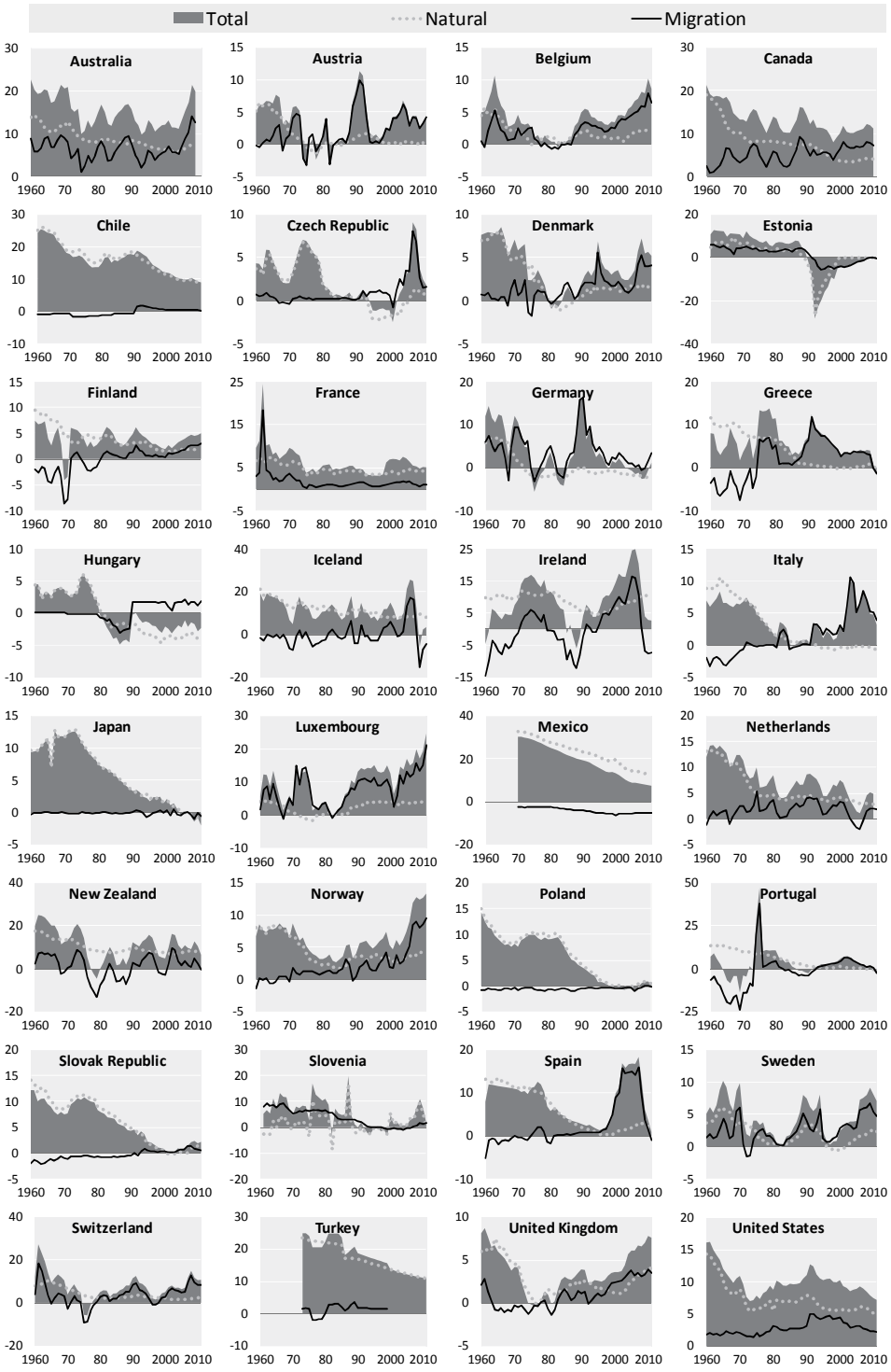
Supplementary figures

Figure 2.A1.1. Old-age support ratios [number of people of working age (20-64) per person of pension age (65+)]: Historical and projected values, 1950-2050



Source: United Nations, World Population Prospects, 2012 Revision.

Figure 2.A1.2. Components of total population growth in OECD countries, 1960-2011, per 1 000 inhabitants

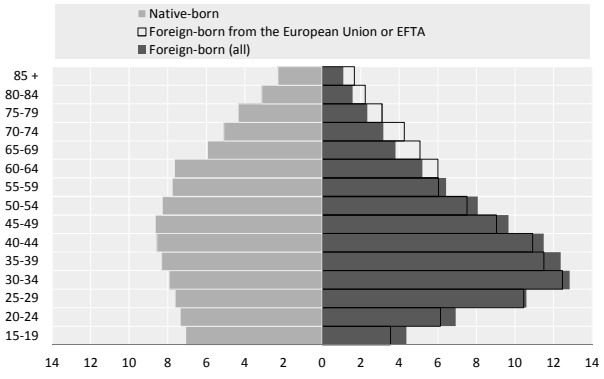


Source: United Nations (2011), "World Population Prospects – The 2010 Revision: Highlights and Advance Tables", United Nations, New York, www.un.org/en/development/desa/publications/world-population-prospects-the-2010-revision.html, accessed 22 May 2013.

Figure 2.A1.3. Age distribution of recent and total foreign-born population in the European Union and the United States

Age distribution of the population in the European Union by place of birth, 2011

Percentage

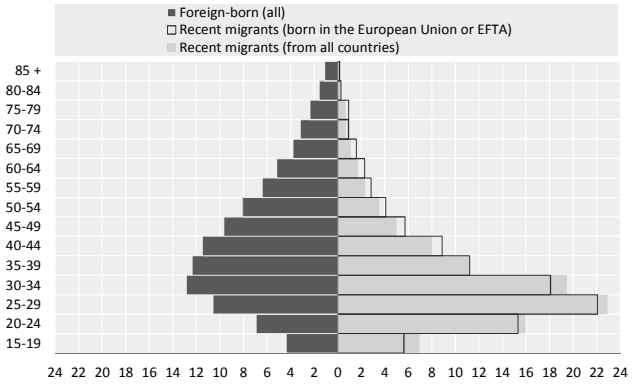


Note: The data exclude Germany.

Source: European Union Labour Force Survey 2011 (Eurostat).

Age distribution of the foreign-born population in the European Union by time of migration and place of birth, 2011

Percentage

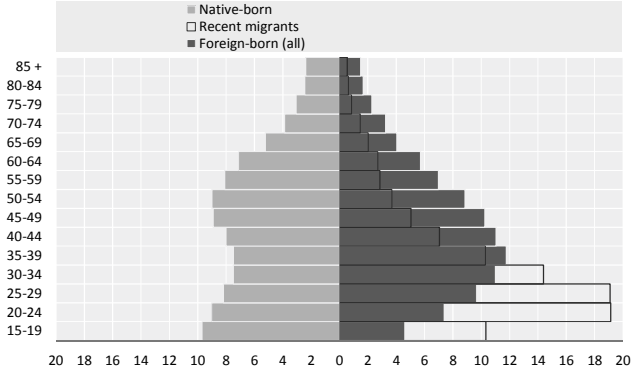


Note: Recent migrants are defined as persons who migrated less than 5 years earlier. The data exclude Germany.

Source: European Union Labour Force Survey 2011 (Eurostat).

Age distribution of the population in the United States by place of birth and time of migration, 2010

Percentage

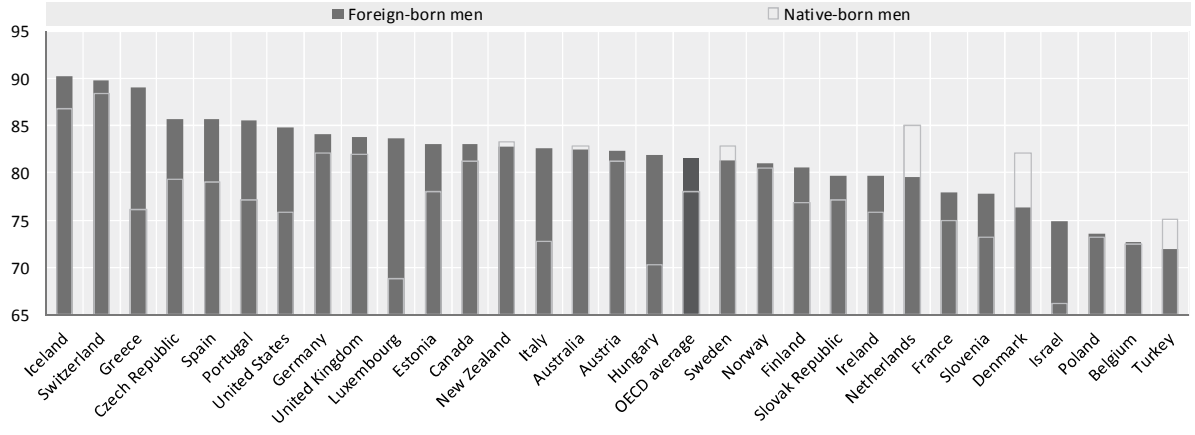


Note: Recent migrants are defined as persons who migrated less than five years earlier.

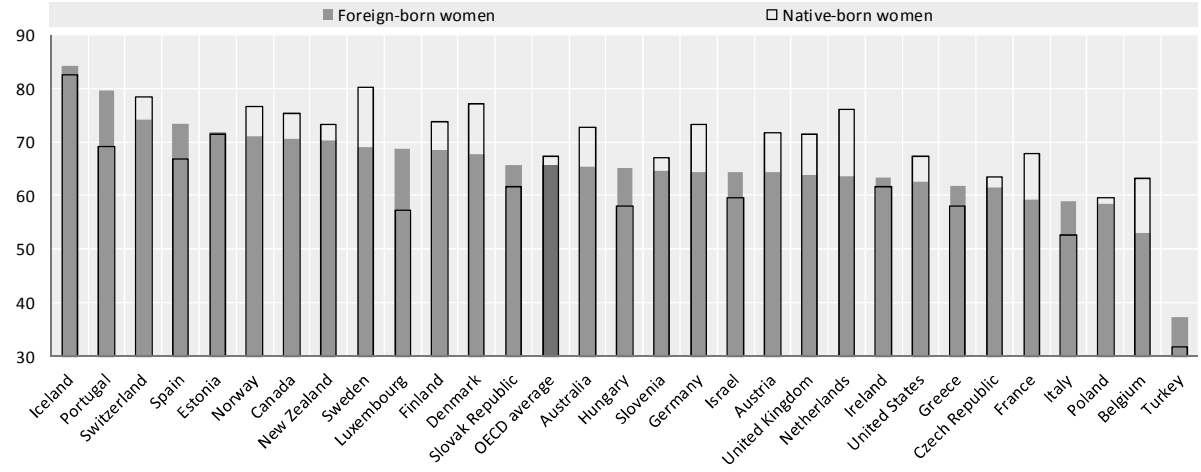
Source: American Community Survey.

Figure 2.A1.4. Participation rates by gender and place of birth in selected OECD countries, 2012

Male participation rates by place of birth in selected OECD countries, 2012
Percentages



Female participation rates by place of birth in selected OECD countries, 2012
Percentages



Note: The population of reference is the population aged 15-64.

Source: European countries: Labour Force Surveys 2012 (Eurostat); United States: Current Population Surveys 2012; Australia, Canada, New Zealand: Labour Force Surveys 2012; Israel: Labour Force Survey 2011.

Chapter 3

Current and future skills of the workforce: The demography of educational attainment and the role of migration

Josep Mestres
OECD

This chapter examines the demographic and education structure of the labour force in OECD countries since 2000 and its evolution over the next decade, paying special attention to the role of international migration. It shows the increase in educational attainment of both native- and foreign-born individuals in the labour force and estimates a continuing increase in the near future, although at lower rates than in the past. In parallel, it projects a shrinking of the share of the lower-educated labour force, with migrants nonetheless accounting for a large share of entries. The chapter projects that the labour force will grow on average 4% in the OECD over the period 2010-20, much less than in the previous decade. It points as well that projected migration inflows will account for all this observed positive labour force growth, even if those inflows will be significantly lower than in the previous decade. The chapter shows how migration will continue to make a positive contribution to labour force growth over the decade even under more limited migration scenarios.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

3.1. Introduction

The working-age population and labour force of the OECD countries will be affected by significant demographic changes in the coming decade. Young cohorts are getting smaller and at the same time older populations are increasing. Although these young cohorts are decreasing, labour market participation rates are actually increasing in most OECD countries, along with levels of educational attainment. But will these increases be enough to offset the reduction in the active population? Will educational attainment levels be sufficient for the available jobs? And what is the role migration will play?

The objective of this chapter is to examine the demographic and education structure of the labour force in OECD countries since 2000 (Section 3.2) and to look at its evolution over the next decade (Section 3.3), paying special attention to the role of international migration.

3.2. Educational attainment of the labour force and the role of migration

This section describes the distribution of the labour force by education level and migrant status (2010) and its evolution since 2000. The data are taken from the European Union Labour Force Survey for European countries, from the American Community Survey for the United States, from the Survey of Labour Income and Dynamics (SLID) for Canada, from the Labour Force Survey for Israel and from the Survey of Education and Work for Australia.

Trends in educational attainment

All OECD countries have seen significant changes in the educational attainment of its population in recent decades, with more and more young persons pursuing their education beyond secondary, often in high-level vocational and technical education if not in university degree programmes (see OECD, 2011). At the same time, high-school drop-out rates remain high in some countries, despite second-chance programmes. Indeed upper-secondary education is now considered the minimum level required for youth to be informed and productive citizens in OECD societies.

Since 2000, immigration has been increasing in most OECD countries and the European Union. Foreign-born workers account on average for around 13% of the total labour force in OECD countries in 2010. A similar percentage is observed among tertiary-educated workers. In recent years, the share of recent immigrants holding a tertiary diploma has actually been increasing but the immigrant population also includes a significant proportion of low-educated persons, many of whom having arrived through family reunification or family formation or having fled war zones or persecution in their countries of origin. Low levels of education have also been characteristic of unauthorised migration in the United States and of labour migration in Southern Europe. In most other countries, legal long-term labour migration by low-educated persons has been more limited, if not entirely absent.

Measures of educational attainment are a useful albeit partial proxy of skill levels. Moreover, they do not take into account the quality of education. In practice, there is no simple way to take into account the classification of level differences across countries in the context of educational programmes or in the intensity of study. In addition, formal educational levels are not a direct measure of skills (see Box 3.1).

Box 3.1. Formal education versus actual skills – are there differences?

Educational levels are a convenient, although imperfect, proxy for individuals' skills. Indeed, individuals with the same educational attainment can have different levels of competences (OECD, 2013). Skills are not only acquired via the formal education system, they are also acquired on-the-job and in other ways. In addition, the quality of educational institutions varies both within and across countries. This may be a particular issue for immigrants, as many of them have studied in a country different from their current country of residence.

A direct measure of skills would be useful in investigating the link between individual competences and social and economic outcomes. The OECD Skills Strategy is taking a broad perspective on skills. It includes all skills which people can acquire, use and maintain over a lifetime. Such a measure of skills will be soon available with the OECD Survey of Adult Skills (Programme for the International Assessment of Adult Competencies or PIAAC). The ultimate objective of the OECD Skills Strategy is to help OECD countries improve the quality and quantity of skills available and make the best possible use of them.

Table 3.1 provides a general overview of educational attainment levels in the labour force in 2010 across OECD countries and the European Union for foreign- and native-born individuals, and the evolution since 2000. Overall, the differences between immigrants and the native-born are not large, although migrants are on average more likely to have a low or a high educational level (in this chapter, "Low" refers to less than upper-secondary attainment, "Medium" to upper-secondary and post-secondary non-tertiary and "High" to tertiary).

In addition, the averages mask some underlying diversity particularly when accounting for the educational attainment of the native population. There are a number of countries where the percentage of foreign-born workers with less than upper-secondary education is higher than that of the native-born by around 20 percentage points, in particular Germany, United States, Greece and France. On the other hand, the same percentage is lower than that of the native-born by more than 10 points in Portugal, Turkey or Malta, countries where improvements in educational attainment of the population have been relatively recent and are still progressing.

Some countries such as Greece, Slovenia, Spain and Finland have immigrant populations with tertiary attainment levels which are 11-16 percentage points lower than those of the native-born, while Australia, Luxembourg, Ireland, Hungary and Poland are in the opposite situation.

In the Europe, migrants coming from the EU27 are more likely to hold a tertiary diploma, compared to third-country nationals (see Annex Table 3.A1.1). This is particularly visible in Denmark, Austria, Switzerland and the Netherlands. The reverse is true for example in Ireland and the United Kingdom.

The share of the lower-educated labour force has shrunk for both native-born and foreign-born but on average more rapidly for the former. Inversely the share of workers holding a tertiary diploma has increased significantly and on average much more for the native-born. There are, however, large differences across countries. For immigrants, the changes observed depend as much on the magnitude and nature of migration over the period as on the progress in educational attainment levels in origin countries. The most significant progress has been registered in Luxembourg, and in Malta, with declines in the share of low-educated migrants and increases in tertiary-educated migrants of over 20 percentage points between 2000 and 2010. These results, however, tell us little about the underlying factors, and notably the importance of demographic changes. It is clear that entering youth are more educated than retiring workers, but by how much? It is also clear that immigrants have better education levels than in the past, but what is their precise contribution to the overall growth in the educational attainment of the labour force?

Table 3.1. Distribution of educational attainment of the labour force by level and immigrant status (2010) and evolution 2000-10

Percentages

	Immigrants						Change in share 2000-10					
	Distribution 2010			Compared to native-born			Immigrants			Native-born		
	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
Australia	13	39	49	-7	-11	18	-8	-4	12	-8	3	5
Austria	28	53	20	13	-14	1	-9	5	4	-4	0	4
Belgium	32	32	36	12	-8	-4	-7	1	5	-11	3	7
Bulgaria	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus[1,2]	29	38	33	9	-2	-7	2	3	-5	-13	0	13
Czech Republic	12	64	24	6	-13	7	-	-	-	-	-	-
Denmark	26	38	36	0	-4	4	4	-12	8	4	-11	7
Estonia	3	55	41	-7	0	7	-6	2	3	-2	-5	7
Finland	25	49	27	10	2	-11	-8	5	3	-9	3	6
France	40	32	28	19	-14	-4	-7	2	5	-8	0	8
Germany	32	46	21	21	-15	-6	-5	3	2	-3	1	2
Greece	49	38	13	19	-3	-16	11	-3	-8	-11	1	10
Hungary	14	52	34	0	-12	12	5	-7	2	-5	-2	7
Ireland	13	38	49	-9	-1	10	-11	3	8	-13	-3	16
Israel	13	34	53	1	-10	9	-5	2	3	-4	-5	9
Italy	42	45	12	7	-2	-5	-7	6	0	-10	4	6
Latvia	7	65	28	-5	4	1	-	-	-	-	-	-
Lithuania	-	64	34	-	5	-1	-	22	-13	-5	12	-7
Luxembourg	23	31	46	6	-21	15	-22	1	22	-8	-4	12
Malta	46	26	28	-15	5	10	-26	6	20	-12	2	10
Netherlands	33	37	30	7	-6	-2	-8	1	7	-4	-3	7
Norway	24	36	40	4	-8	4	10	-14	4	6	-11	4
Poland	-	50	46	-	-16	20	-	-	-	-	-	-
Portugal	48	32	20	-18	14	4	-11	7	4	-13	6	7
Romania	-	-	-	-	-	-	-	-	-	-	-	-
Slovak Republic	-	58	30	-	-18	12	-	-	-	-	-	-
Slovenia	27	59	14	15	-2	-13	-1	1	-1	-7	-3	10
Spain	43	34	23	0	12	-12	-2	9	-7	-11	3	9
Sweden	26	37	37	10	-15	5	1	-9	7	-4	2	2
Switzerland	27	39	34	14	-16	1	-	-	-	-	-	-
Turkey	51	23	26	-12	2	10	-	-	-	-	-	-
United Kingdom	14	47	39	-5	2	3	-12	17	-5	-11	3	8
United States	27	38	34	19	-14	1	-5	3	3	-5	-1	5
Eurozone average	**31**	**41**	**28**	**6**	**-4**	**-1**	**-7**	**3**	**4**	**-9**	**0**	**8**
EU-27 average	**25**	**44**	**31**	**3**	**-5**	**3**	**-6**	**3**	**3**	**-8**	**0**	**7**
OECD average	**25**	**42**	**32**	**4**	**-6**	**2**	**-5**	**2**	**3**	**-7**	**0**	**7**

Note: Labour force includes active population aged 15-64. The sign '-' corresponds to data cells that do not meet Eurostat threshold for publication; empty cells if data not available. The fourth, fifth and sixth columns show the difference between the percentage of migrant workers in each respective education level with that of the native-born (i.e. a positive figure means that the share is higher for migrants).

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: European countries: Labour Force Surveys (Eurostat), 2000 and 2010; United States: 2000 Census and American Community Survey 2010; Israel: Labour Force Survey, 2000 and 2010. Australia: Survey of Education and Work, 2001 and 2011.

Demography of educational attainment

A decomposition of the change in the distribution of the labour force by education level between 2000 and 2010 has been carried out which enables to highlight the contribution of recent migrants. This will serve as a benchmark for a similar decomposition covering the period 2010-20 in the following section.

General methodological approach

The analyses presented in this chapter examine change in educational attainment through a *demographic accounting framework*. Succinctly, the *net* change over a period for a particular characteristic is decomposed into contributions coming from young workers, new immigrants, prime-age workers and older workers, where the age-related components of change are estimated by comparing the situation of so-called "pseudo age cohorts" in 2000 and 2010, respectively (see Annex 3.A1 for the details). The pseudo–cohort approach implicitly includes the effects of emigration and mortality, which cannot be observed directly.[1]

In addition, since characteristics are observed at two points in time, abstraction is made of multiple changes that may have occurred over the period. Note also that with the pseudo-cohort approach, much of the change observed for young workers and older workers will be due to workforce entries and exits, respectively. This means in practice that the contributions to change in the labour force due to young and older workers are always positive, respectively negative for these groups. For example, on average across countries, the net changes in employment for young workers and older workers amount to approximately 87% of the total employment for an entry cohort (aged 25-34 in the year 2010) and 80% of the total employment for an exit cohort (aged 45-54 in the year 2000). For the prime-age group, on the other hand, the net change measure may hide a considerable amount of movements which are not visible.

The demography of changes in the educational attainment of the labour force

The labour force has increased by about 1 percentage point per year on average between 2000 and 2010 in OECD and EU countries. This growth will decline to less than 0.4 percentage points per year over the coming decade in the OECD and to almost zero in the European Union. The demographic composition of this change is portrayed in Table 3.2, applying the decomposition methodology described in Annex 3.A1. The labour force renewed itself by about a quarter over the period, from inflows (new entrants and immigrants) replacing outflows (retirees). Immigrants on average accounted for 20% of the inflows, with contributions far above average in Ireland (34%), Luxembourg (57%), Cyprus[2,3] (49%), Spain (40%) and Switzerland (40%).

Table 3.2. Contributions to growth in the labour force and contributions to growth by demographic group, 2000-10

Percentages

	Total growth of the labour force	Young workers (new entrants)	New immigrants			Prime-age workers	Older workers (retirees)	Net turnover	Replacement surplus (entrants of younger + retirement of older)
	(A+B+C+D)	(A)	(B)	EU 27	Non-EU27	(C)	(D)	(see Notes)	(A+D)
Australia	31	30	9			5	-14	29	17
Austria	11	22	6	3	3	-1	-17	23	5
Belgium	11	24	8	4	4	-4	-17	27	7
Bulgaria	-1	18	0	0	0	3	-22	21	-3
Canada	33	33	13			0	-15	30	18
Cyprus[1,2]	33	25	24	11	13	-2	-14	33	11
Czech Republic	3	21	1	1	0	3	-21	23	0
Denmark	2	18	2	1	2	-2	-20	21	-2
Estonia	5	25	1	0	0	-1	-20	23	6
Finland	0	19	2	1	1	0	-18	20	1
France	10	26	3	1	2	1	-20	25	6
Germany	6	29	4	1	2	-2	-25	30	4
Greece	9	22	5	1	4	1	-18	23	4
Hungary	4	22	1	1	0	2	-20	23	2
Ireland	22	25	13	9	4	-2	-12	25	13
Israel	36	37	6			6	-12	31	24
Italy	6	17	6	3	4	0	-18	21	-1
Latvia	5	26	1	0	0	-2	-19	24	7
Lithuania	-3	22	0	0	0	-5	-20	24	2
Luxembourg	22	20	26	22	4	-5	-18	35	2
Malta	15	30	1	1	1	2	-18	26	12
Netherlands	8	21	2	1	1	-2	-14	19	8
Norway	10	21	5	2	3	-1	-15	21	5
Poland	2	28	0	0	0	-5	-21	27	7
Portugal	7	21	4	1	3	0	-18	21	4
Romania	-15	18	0	0	0	-7	-26	26	-8
Slovak Republic	5	24	0	0	0	-1	-17	21	7
Slovenia	8	28	1	0	1	0	-19	24	8
Spain	29	25	17	5	12	2	-14	29	11
Sweden	14	24	6	2	4	2	-20	26	4
Switzerland	13	18	12	8	4	-1	-17	24	1
United Kingdom	9	28	12	5	7	-6	-23	35	5
United States	13	20	6			-1	-13	20	7
Eurozone average	**10**	**24**	**6**	**2**	**4**	**0**	**-19**	**25**	**5**
EU27 average	**8**	**24**	**5**	**2**	**3**	**-2**	**-21**	**26**	**4**
OECD average	**12**	**24**	**6**			**0**	**-18**	**25**	**6**

Note: The contribution of each group is the net change in the labour force for the group divided by the total number of persons in the labour force in 2000. Net turnover is half the sum of the absolute values of the individual contributions. It understates total turnover, because some entries and exits within the prime-age group and more generally as a result of in- and out-migration of residents may be offsetting. Data for Germany and the United Kingdom on the composition of growth by demographic group are based on 2005-10 change, adjusted to agree with the observed change in the labour force for the period 2000-10.

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2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

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The inflows of young resident workers into the labour force have exceeded the outflows of older workers by about 6% of the labour force on average. With total growth in the labour force at 11% in the OECD (12% in the European Union) over the period, immigrants have thus accounted for over half of the total labour force growth since 2000. In a number of countries (Switzerland, Italy, Luxembourg and the United Kingdom), all or almost all of the growth in the labour force has come from the arrival of new immigrants.

In the European Union, on average about half of the new immigrant entries have arrived from EU27 countries. The majority of migrants have come from EU27 countries in countries like Switzerland (65% of total migrant flows), Ireland (72%), or Luxembourg (83%).

Table 3.3 provides a general overview of average educational attainment levels of entrants to, and exits from, the labour force over the period from 2000 to 2010, excluding youth under 25 in education.[4] On average overall, the differences between new immigrants and retiring older workers was very large, with the percentage of young new entrants having low attainment levels being 29 percentage points lower than retiring older workers and the percentage of new entrants having high attainment levels being 21 percentage points higher. The improvement in attainment levels in the labour force in the countries of Southern Europe and Ireland was especially large, with differences in the share of low-educated workers between young workers and retirees of about 50 points. In the meantime, almost all countries have experienced a large and positive difference in the share of tertiary-educated among young workers and retirees.

In most countries, the attainment levels of new immigrants entering into the workforce were also higher than those of retiring cohorts, but not to the same extent as young resident entrants. The United States and, to a lesser extent, Sweden and Germany are the only countries which saw more immigrant entries into the labour force of lower attainment levels than those of retiring cohorts. In the European Union, most immigrants originating from EU27 have higher educational attainment levels than retirees and also than immigrants from third countries. These results by themselves point to a labour market role for new immigrants that may not resemble that for young new entrants, with generally much higher attainment levels.

Table 3.3. Educational attainment of the labour force, new entrants, new immigrants and retirees, 2010

	Low attainment				Medium attainment				High attainment			
	Older	Young	New immigrants		Older	Young	New immigrants		Older	Young	New immigrants	
			All	EU27			All	EU27			All	EU27
	(percent of all retirees)	(percentage points +/- retirees)			(percent of all retirees)	(percentage points +/- retirees)			(percent of all retirees)	(percentage points +/- retirees)		
Australia	43	-36	-36		32	+16	+6		24	+21	+30	
Austria	28	-20	-4	-18	60	+11	-10	-2	11	+9	+14	+20
Belgium	49	-37	-19	-26	28	+11	+4	+4	23	+25	+15	+22
Bulgaria	39	-32	-39	-39	43	+17	-10	-43	18	+15	+49	+82
Canada	16	-10	-8		35	-10	-10		49	+19	+18	
Cyprus[1,2]	57	-52	-22	-32	28	+2	+11	+18	16	+50	+11	+13
Czech Republic	18	-14	-7	-12	73	-4	-8	-4	10	+18	+15	+16
Denmark									27	+20	+8	+25
Estonia	22	-11	-13	-2	50	0	-31	-37	29	+11	+43	+39
Finland	42	-36	-7	-5	32	+20	+13	+14	27	+17	-6	-9
France	44	-32	-8	-10	39	+3	-9	-7	17	+29	+17	+17
Germany	26	-16	+2	-6	52	+14	-17	-13	22	+2	+15	+19
Greece	66	-52	-10	-26	23	+19	+11	+26	11	+33	0	0
Hungary	29	-20	-17	-17	55	+1	-8	-9	16	+19	+25	+27
Ireland	58	-56	-47	-45	27	+8	+12	+17	14	+48	+35	+27
Israel	26	-20	-14		31	+14	+2		43	+7	+12	
Italy	65	-52	-23	-36	25	+34	+22	+36	10	+18	+1	+1
Latvia	25	-12	-18	-25	57	-8	+2	+43	18	+20	+16	-18
Lithuania	28	-27	-28	-28	18	+27	+18	+7	53	0	+10	+22
Luxembourg	45	-32	-31	-30	40	+9	-17	-19	15	+23	+48	+49
Malta	86	-43	-51	-55	13	+12	+19	+20	1	+31	+32	+36
Netherlands	33	-19	-2	-9	47	-5	-15	-16	20	+24	+17	+26
Norway									26	+21	+10	+11
Poland	30	-27	-24	-28	59	-8	-10	-20	11	+34	+34	+48
Portugal	89	-54	-43	-56	5	+27	+35	+39	6	+27	+7	+17
Romania	64	-50	-34	-64	28	+26	+6	+25	8	+24	+28	+39
Slovak Republic	19	-14	-1	+9	72	-9	-39	-54	8	+23	+39	+45
Slovenia	30	-24	-9	-21	56	+4	+6	-21	14	+21	+4	+42
Spain	80	-51	-38	-50	6	+16	+30	+37	14	+35	+8	+12
Sweden	29	-18	+3	-11	42	+10	-19	-20	29	+9	+17	+31
Switzerland	26	-19	-7	-25	62	-7	-29	+1	13	+26	+36	+41
United Kingdom	30	-28	-14	-13	53	-2	+4	+11	17	+30	+9	+2
United States	19	-15	+11		52	-2	-14		29	+18	+3	
Eurozone average	**50**	**-36**	**-18**	**-25**	**35**	**+11**	**+2**	**+4**	**15**	**+25**	**+16**	**+22**
EU-27 average	**44**	**-32**	**-19**	**-25**	**40**	**+9**	**0**	**+1**	**17**	**+23**	**+19**	**+24**
OECD average	**39**	**-29**	**-15**		**46**	**+3**	**-6**		**21**	**+21**	**+11**	

Note: See Table 3.2. "Low" here refers to less than upper-secondary attainment, "medium" to upper-secondary and post-secondary non-tertiary, "high" to tertiary. The second, third and fourth columns of each attainment level give the difference between the percentages of persons in the attainment level within the group compared to the corresponding percentage within the retiring cohort. Data on low and medium attainment for Denmark and Norway were unusable because of breaks in the attainment series. European Union average corresponds to the average of the European Union countries included in the table.

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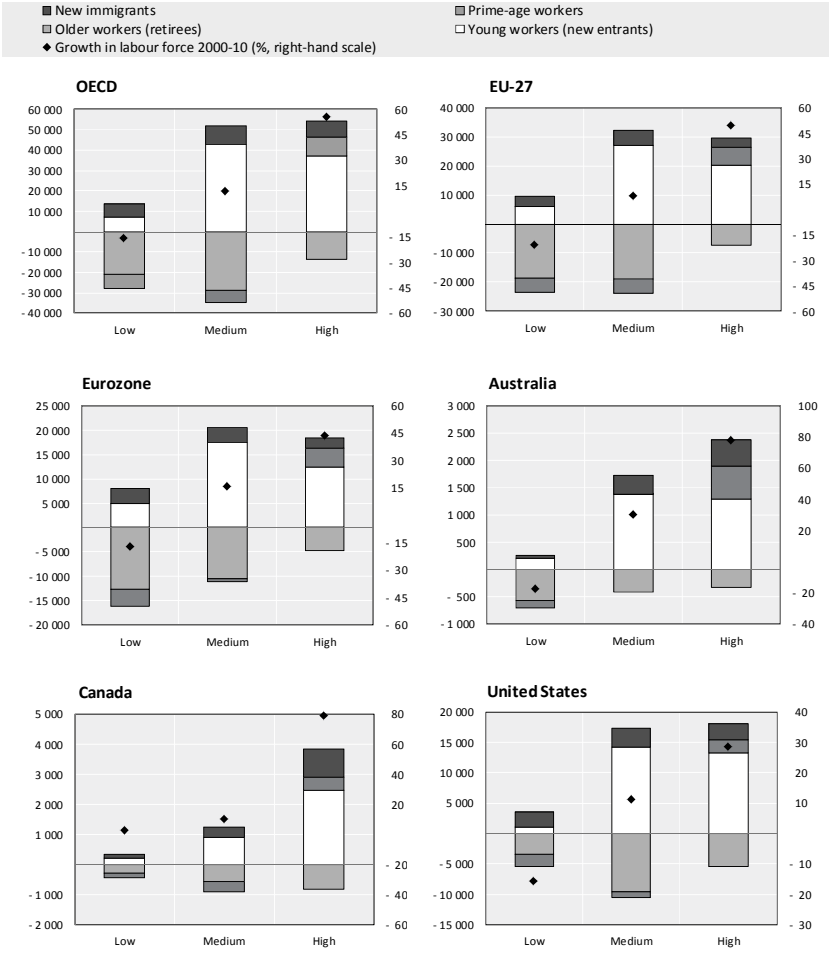
The composition of changes in the educational attainment of the labour force

The results presented above, focus on compositional changes but tell us little about volumes, that is about the relative numbers of entrants, new immigrants and retirees, and possible demographic imbalances resulting from large retiring cohorts compared with declining youth cohorts. To get a clearer picture of the contributions of various demographic groups to the evolution of educational attainment in the labour force, we therefore proceed to the decomposition of the total absolute change in the labour force by attainment level over the 2000 to 2010 period.

Figure 3.1 gives the result for the OECD, the European Union and Eurozone countries as a whole and for Australia, Canada and the United States.[5] The results show the composition of change in the educational attainment of the labour force over the period 2000-10.

Figure 3.1. Changes in the educational attainment of the labour force, by source, 2000-10

Thousands



Source: European countries: Labour Force Surveys (Eurostat), 2000 and 2010; United States: 2000 Census and American Community Survey 2010; Canada: Survey of Labour and Income Dynamics, 1997-99 and 2007-09. Israel: Labour Force Survey, 2000 and 2010. Australia: Survey of Education and Work, 2001 and 2011.

The number of young workers entering the labour force with high levels of educational attainment is much larger than that of retiring older workers, with, for example, almost three young workers at a high education level entering the labour force for each retiring worker at this level. Some of the increase in attainment has been occurring in tertiary high-level technical and vocational qualifications, forms of education which were less common decades ago than is currently the case. For low attainment, the situation is the reverse; there are three retiring workers for every entry.

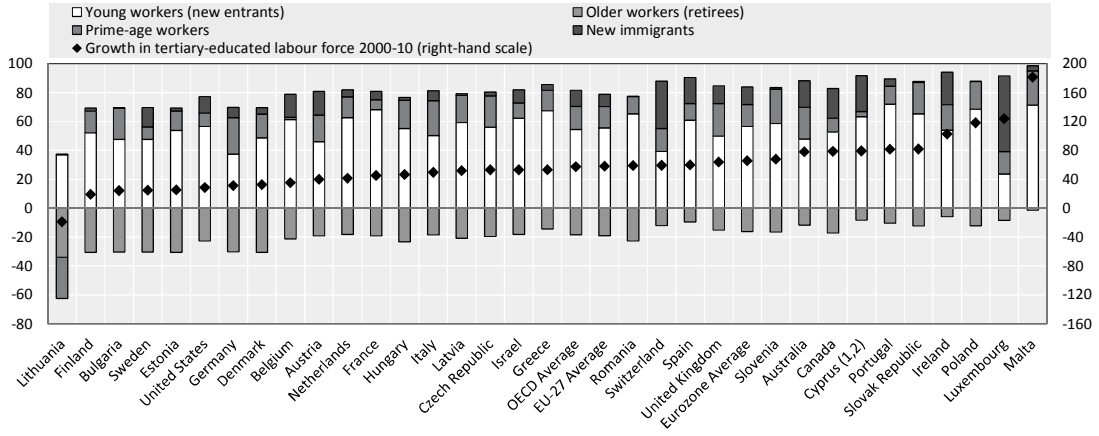
That some upgrading in the educational attainment of the workforce was occurring is well known. It is the difference relative to the retiring cohort that is noteworthy. In the European Union, the overall increase in the number of persons in the labour force with tertiary attainment has been of 58% over the past decade, while the decline in workers with less than upper-secondary education has been about 22%. Workers with medium education levels have increased by about 12%. In Australia, the overall increase in the number of persons in the labour force with tertiary educational was 78% and with medium education levels 30%. In the United States, where tertiary education levels reached high levels earlier than in Europe, the increase in the tertiary-educated labour force was about 28%. Persons in the labour force with mid-range education increased by 10%, while those with low education declined by 9%.

New immigrants were found more often in medium- and low-education levels than in high. They accounted for about 14% of the increase in high-educated workers in Europe (in the EU27 38% were originating from another EU member state, see Table 3.A2.3.) and 20% in the United States. While low-educated workers have declined in numbers, immigrants accounted for almost 40% of the new workers at this education level in Europe and 70% in the United States.

Figures 3.2a through 3.2c give, for all countries, the general picture of changes in the labour force by educational attainment level and source over the 2000-10 decade. The strong increase in tertiary attainment levels among new entries compared with retiring cohorts (Figure 3.2a) is seen universally. Indeed, it may even be underestimated, because a certain proportion of increases in the prime-age groups consist of late completers, that is, persons completing a first tertiary degree after the age of 24. The average ratio of young entrants to retiring older workers is more than 3.5 which hardly suggests a replacement problem at this early juncture of ageing, at least in terms of educational attainment levels. The share of immigrants in the increase in the labour force with tertiary attainment averages about 18%, with especially high levels for Luxembourg (63%) and Switzerland (43%) and shares between 20 and 35% in Australia, Canada, Sweden, Austria, Belgium, Spain, Ireland and the United Kingdom.

Figure 3.2a. Changes in the demographic composition of the tertiary-educated labour force, 2000-10

Percentages



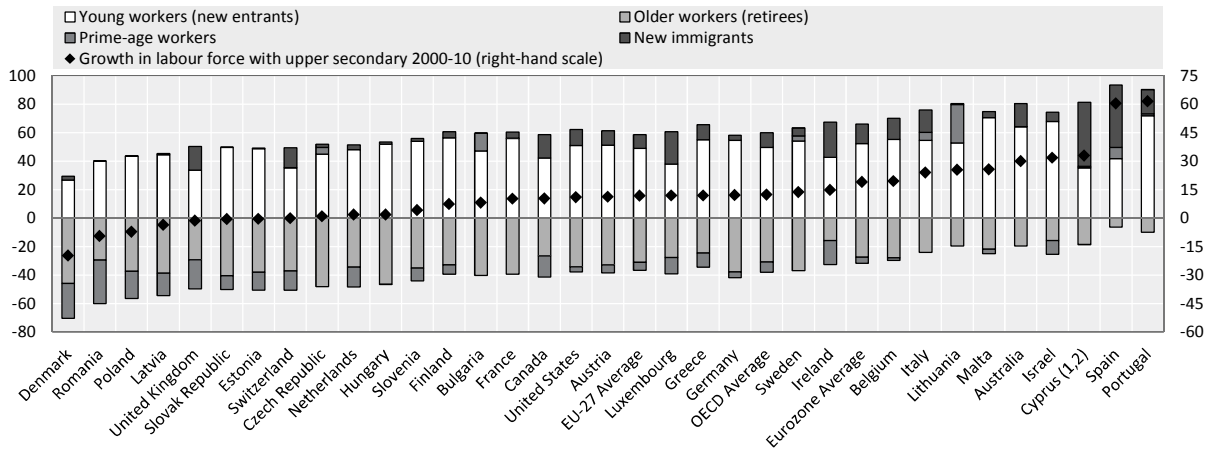
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Figure 3.2b. Changes in the demographic composition of the upper-secondary educated labour force, 2000-10

Percentages



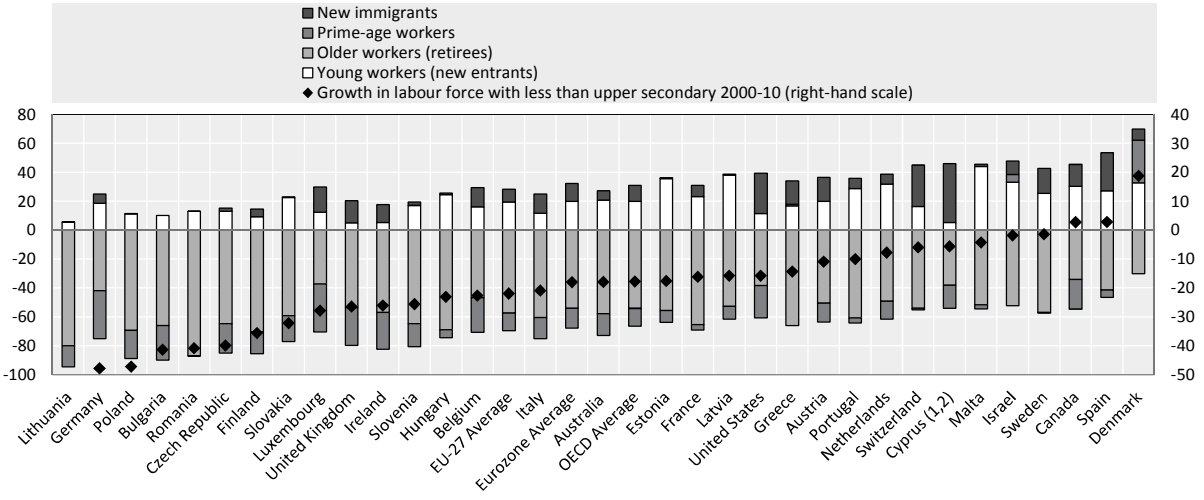
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Figure 3.2c. Changes in the demographic composition of the less than upper-secondary educated labour force, 2000-10

Percentages



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Note that there is no obvious relation between the extent of replacement of older workers by younger ones and the share of immigrants in the increase in tertiary attainment levels. By contrast, there are relatively few entries of low-educated workers into the labour force compared with retirements of such workers, with entries representing on average about 40% of retirements (Figure 3.2c). As was the case for the high-educated, entries of young mid-educated workers also tend to outnumber retirements, except in a few countries, in particular, Denmark, Norway, Switzerland and the Czech Republic. On average there are about one and one-half entering mid-educated workers for every retiring one. The role of migration in the evolution of the low- and mid-educated workforces (Figures 3.2b and 3.2c) is more evident than was the case for the highly-educated; but again, there is no obvious relationship between a "replacement deficit" and the extent of entering low- and mid-educated immigrants.

There is some selectivity in favour of high-skilled migrants in a number of countries which have seen considerable labour migration over the past decade, namely Ireland, Luxembourg and Switzerland, but most of these movements have occurred in the context of free-circulation rather than discretionary migration from non-EU countries, where employers recruit workers from abroad in response to labour market needs and where the declared needs of employers are generally verified by destination country administrations.

On the other hand, in the "new" migration countries of Southern Europe, which have had substantial labour migration over the past decade as well as being open to lower-skilled migration, the increases in the labour force have come largely from lower-educated labour migrants. However, not all of these have been recruited from abroad; many have been unauthorised and later regularised, or been hired within the country after arrival under a non-work status.

In summary then, the past decade saw the replacement of retiring labour force cohorts by much more highly educated new entrants. The most highly educated were far more numerous than those retiring, which by itself would not suggest a problem with the supply of highly educated workers. Immigrants, however, added to this number over the decade, representing about 16% of tertiary-educated entries into the labour force, which in turn suggests that the labour market was able to absorb far more, at the risk, perhaps, of some tertiary-educated persons taking up jobs for which they were ostensibly overqualified. This rich supply of skills among entrants does not exclude the possibility of skill shortages in certain areas, however.

3.3. Projections of the labour force by educational attainment for 2020

This section provides estimates of the *size of the labour force by educational attainment in OECD countries and the European Union up to 2020*. Projections on educational attainment are complex as they depend not only on demographic evolutions, in particular assumptions about migration, but also on changes in rates of access to education or changing lengths of studies (OECD, 2008).

Existing projections of the educational attainment of the population by gender and age groups have been developed respectively by the Education Policy and Data Center (EPDC) and the International Institute for Applied Systems Analysis (IIASA).[6] While they model educational enrolment and attainment in detail, they do not estimate future participation in the labour force nor do they differentiate between native- and foreign-born individuals. The European Centre for the Development of Vocational Training (Cedefop) has forecasted the educational attainment of both the overall population and labour force up to 2020 (Cedefop, 2010), but their study does not differentiate between native- and foreign-born individuals either.

Sources and methodology

The projections of the labour force by educational attainment in 2020 are obtained by estimating separately the shares of each educational level in the labour force by birth status, age group and gender and the projected size of the labour force by birth status, age group and gender. The size of the labour force for each educational level is calculated afterwards by combining the projections from both. The detailed methodology is described in Anne 3.A2.

This methodology projects the size of the labour force in 2020 by educational level, birth status, age and gender. This allows decomposing the change between the observed labour force in 2010 and the projected labour force in 2020 by demographic group and educational level, as was done for the 2000-10 period in the previous section. This exercise is subject to some uncertainty, however, given the various assumptions made in the different projections for population, labour force participation rates and educational attainment. For the educational attainment, two different projection scenarios are estimated. Scenario 1 assumes progress in educational attainment of cohorts aged 35-64,

already in the labour market in 2010, but no educational upgrade for those aged 15-34 in 2020 (compared to 2010). Scenario 2 assumes progress in educational attainment for all cohorts in 2020. Please see Annex 3.A2 for further details.

Labour force projections for 2020

The growth in the labour force between 2010 and 2020 is projected to be on average only 0.4% per year in OECD countries and almost zero in the European Union, compared to around 1% per year in the previous decade in both cases. The different contributions of each demographic group following the decomposition methodology explained in Annex 3.A1 are shown in Table 3.4. The projected net turnover of the labour force is around 25%, implying that about a quarter of the labour force will be renewed (new entrants and immigrants will replace retirees), as was the case over the previous decade.

Table 3.4. Projected growth in the labour force and contributions to growth by demographic group, 2010-20

Percentages

	Labour force growth		Young workers (new entrants)		Migration inflows 2010-20				Prime-age workers		Older workers (retirees)		Net turnover (see notes)	Replacement surplus (entrants of younger + retirement of older)
	2010-20	2000-10	Contributions to labour force growth in 2010-20	Ratio of contributions in 2010-20 to those in 2000-10	Contributions to labour force growth in 2010-20			Ratio of contributions in 2010-20 to those in 2000-10	Contributions to labour force growth in 2010-20	Ratio of contributions in 2010-20 to those in 2000-10	Contributions to labour force growth in 2010-20	Ratio of contributions in 2010-20 to those in 2000-10		
	(A+B+C+D)		(A)		Total (B)	EU 27	Non-EU 27		(C)		(D)			(A+D)
Australia	10	*31*	22	*0.74*	6			*0.66*	1	*0.17*	-19	*1.41*	24	3
Austria	1	*11*	18	*0.80*	5	2	3	*0.72*	0	*0.08*	-22	*1.29*	22	-4
Belgium	7	*10*	22	*0.91*	12	5	7	*1.50*	-3	*0.66*	-24	*1.37*	30	-2
Bulgaria	-6	*-1*	18	*0.99*	0			*3.41*	0	*-0.09*	-24	*1.13*	21	-6
Canada	6	*21*	20	*0.91*	6			*0.49*	1	*-0.55*	-20	*1.85*	23	0
Cyprus[1,2]	-21	*33*	12	*0.47*	5	2	3	*0.21*	-17	*7.81*	-21	*1.50*	27	-9
Czech Republic	2	*3*	20	*0.97*	1.1	0.6	0.5	*0.99*	4	*1.46*	-24	*1.11*	25	-3
Denmark	2	*-1*	20	*1.08*	4	1	3	*1.87*	0	*0.04*	-22	*1.10*	23	-2
Estonia	-3	*5*	20	*0.78*	0			*0.00*	0	*0.35*	-23	*1.14*	22	-3
Finland	-1	*2*	21	*1.10*	3	1	2	*1.58*	1	*-2.95*	-26	*1.39*	25	-4
France	5	*10*	26	*1.00*	2	1	2	*0.77*	1	*1.18*	-24	*1.20*	26	2
Germany	-5	*5*	16	*0.60*	2	1	1	*0.67*	1	*-0.46*	-24	*1.02*	21	-8
Greece	1	*10*	19	*0.85*	4	1	3	*0.82*	-3	*-5.55*	-20	*1.06*	23	-1
Hungary	0	*5*	23	*1.04*	1.3	1.0	0.3	*1.82*	0	*0.07*	-25	*1.22*	25	-2
Ireland	6	*24*	24	*0.95*	0			*0.00*	0	*0.25*	-18	*1.48*	21	6
Israel	14	*36*	30	*0.82*	1			*0.20*	2	*0.27*	-19	*1.53*	26	11
Italy	5	*6*	20	*1.16*	6	2	3	*0.88*	2	*5.29*	-23	*1.27*	26	-3
Latvia	-3	*5*	20	*0.76*	0			*0.69*	-2	*0.79*	-21	*1.10*	22	-2
Lithuania	-4	*-3*	23	*1.04*	0			*1.49*	-4	*0.83*	-23	*1.12*	25	0
Luxembourg	16	*23*	22	*1.09*	19	16	4	*0.74*	-3	*0.63*	-22	*1.22*	33	0
Malta	-4	*16*	25	*0.83*	0			*0.00*	-7	*-3.54*	-22	*1.23*	27	3
Netherlands	3	*8*	21	*1.00*	3	1	2	*1.44*	0	*0.22*	-21	*1.54*	23	0
Norway	11	*10*	23	*1.11*	7	3	4	*1.28*	1	*-1.18*	-20	*1.27*	25	3
Poland	-3	*2*	23	*0.82*	0			*0.00*	-2	*0.41*	-24	*1.13*	25	-1
Portugal	1	*8*	20	*0.92*	3.1	0.5	2.6	*0.76*	-1	*-3.28*	-22	*1.16*	23	-1
Romania	0	*-15*	22	*1.20*	0			*0.00*	-2	*0.32*	-20	*0.74*	22	2
Slovak Republic	2	*5*	23	*0.97*	0			*2.82*	3	*-1.94*	-24	*1.42*	25	-1
Slovenia	1	*9*	22	*0.79*	2	0.2	1.9	*2.25*	2	*-6.74*	-25	*1.29*	25	-3
Spain	2	*30*	18	*0.73*	4	1	3	*0.24*	-2	*-0.90*	-19	*1.35*	22	0
Sweden	5	*12*	21	*0.85*	7	2	5	*1.22*	0	*0.12*	-22	*1.11*	25	-2
Switzerland	9	*13*	13	*0.70*	19	11	8	*1.52*	-3	*2.98*	-20	*1.17*	28	-7
Turkey	14		32		0				-6		-13		25	20
United Kingdom	5	*9*	18	*0.74*	8	3	5	*0.72*	0	*0.02*	-20	*0.99*	23	-2
United States	5	*13*	21	*1.05*	5			*0.80*	-1	*1.87*	-20	*1.54*	24	1
Eurozone average	**1**	***13***	**21**	***0.87***	**4.2**	**2.0**	**2.2**	***0.58***	**-2**	***1.85***	**-22**	***1.28***	**25**	**-1**
EU-27 average	**0.5**	***9***	**21**	***0.90***	**3.4**	**1.5**	**1.9**	***0.64***	**-1**	***1.10***	**-22**	***1.20***	**24**	**0**
OECD average	**4**	***11***	**21**	***0.92***	**4**			***0.71***	**-1**	***0.95***	**-22**	***1.24***	**25**	**-1**

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The projection shows a negative labour force replacement rate (entry of young – retirement of older workers) of -1% in the OECD (and close to zero in the European Union) between 2010 and 2020, compared to the 5-percentage-point surplus observed in the previous decade. The difference will be largely due to the increase in retirees compared to 2000-10 rather than a decline in new entrants. The contribution of the retiring cohorts to change in the labour force is projected to be much larger (124%) than in the previous decade, while that of new entrants will be somewhat smaller (92%).

Several OECD and European countries are projected to have a labour force replacement deficit. Larger retiring cohorts and smaller younger cohorts entering the labour force will imply a replacement deficit of around 9% in Cyprus,[7,8] 8% in Germany, 7% in Switzerland and 4% in Austria and Finland, for example.

Migration inflows for the period 2010-20 are projected to contribute 4% to the growth of the labour force on average, which corresponds to the entire projected labour force growth over the period. In the European Union, migrants contribute 3% to the growth of the labour force and are responsible for avoiding a decline in the labour force in 2020.[9] Only Luxembourg and Switzerland, both contributing at 19%, deviates strongly from this pattern. Many OECD and European countries would have negative labour force growth in 2020 without the positive contribution of migration.

Large declines in the contribution of migration are projected for the coming decade, with a projected average decline of over one third in the European Union, and even more in countries which were hard hit by the economic crisis, such as Ireland and, Spain, and the United Kingdom. Any further growth in the labour force would need to come from increases in participation rates or from additional increases in migration.

Migrants will account, on average, for around 16% of the entries into the labour force between 2010 and 2020, compared to 24% in the previous decade. They will represent a higher proportion of the entries in countries like Switzerland (59%), Luxembourg (47%), Belgium (35%) or the United Kingdom (30%). In other countries net migration inflows will represent a smaller fraction of the overall labour force and a smaller fraction of the entries, as in Germany and in the Netherlands (12%) or in France (8%), although they are projected to contribute positively to overall labour force growth.

Educational attainment projections of the labour force in 2020

The labour force in 2020 will be more educated: more than one in three individuals in the labour force will be highly educated (ISCED level 5 or 6), while less than one in five will have a low educational attainment (ISCED level 0, 1 or 2).[10] Table 3.5 shows the projected labour force in OECD and EU countries by level of educational attainment under the two projection scenarios. Compared to 2010, the projections show an increase in the share of highly educated individuals in both scenarios (around 3 and 4 percentage points more than in 2010 on average) and a decrease in the share of low-educated. However, the share of low-educated individuals in the labour force will continue to be high in Southern European countries, like Portugal and Turkey (over 50% under both scenarios) or Spain and Italy (over 30%). The labour force will have fewer low-educated individuals (10% of the labour force or less) in the United States, Canada and Israel.

Table 3.5. Educational attainment of the labour force in 2010 and projection scenarios in 2020

Percentages

	2010			2020 Scenario 1			2020 Scenario 2		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
Australia	17	64	19	15	67	19	14	65	21
Austria	17	45	38	14	46	41	12	44	44
Belgium	22	38	39	20	39	41	18	38	44
Bulgaria	15	60	26	13	59	28	13	59	28
Canada	13	30	57	11	29	60	10	30	60
Cyprus[1,2]	21	40	39	15	39	46	13	39	48
Czech Republic	6	76	17	5	76	19	5	76	19
Denmark	25	42	32	22	42	36	21	42	37
Estonia	10	55	35	10	54	36	10	54	36
Finland	16	47	37	13	49	38	12	48	41
France	24	44	32	19	44	37	17	43	40
Germany	16	58	26	14	59	26	14	59	28
Greece	32	41	27	28	44	29	26	43	32
Hungary	13	64	23	12	64	24	11	64	25
Ireland	19	39	42	16	40	44	14	40	46
Israel	13	42	46	10	45	45	10	43	48
Italy	36	47	17	33	50	18	30	48	22
Latvia	11	61	28	12	57	31	12	57	31
Lithuania	6	59	36	7	53	41	7	52	42
Luxembourg	20	40	40	20	41	40	18	40	42
Malta	60	21	19	55	23	21	50	25	25
Netherlands	26	42	32	23	43	34	21	43	36
Norway	21	43	36	20	41	38	21	42	37
Poland	8	66	26	6	61	32	6	61	32
Portugal	63	20	17	57	23	20	54	24	22
Romania	22	62	16	19	61	19	19	61	19
Slovak Republic	6	76	18	5	74	21	5	74	21
Slovenia	13	61	26	10	62	28	10	61	30
Spain	42	25	32	39	24	37	36	25	39
Sweden	18	48	33	15	48	36	15	48	38
Switzerland	17	48	35	17	47	36	17	47	36
Turkey	63	21	16	57	24	19	57	24	19
United Kingdom	19	45	36	17	45	38	15	43	42
United States	12	51	38	11	50	38	10	49	41
Eurozone average	**26**	**45**	**29**	**23**	**46**	**31**	**21**	**45**	**34**
EU-27 average	**22**	**50**	**29**	**19**	**50**	**31**	**18**	**49**	**33**
OECD average	**20**	**48**	**31**	**18**	**48**	**34**	**17**	**48**	**35**

Scenario 1 assumes that those aged 15-34 in 2020 have the same educational distribution as those aged 15-34 in 2010.

Scenario 2 assumes that those aged 15-34 in 2020 have experienced the same upgrade in their educational attainment between 2010 and 2020 as those aged 15-34 in 2010 did between 2000 and 2010 (see Annex 3.A2).

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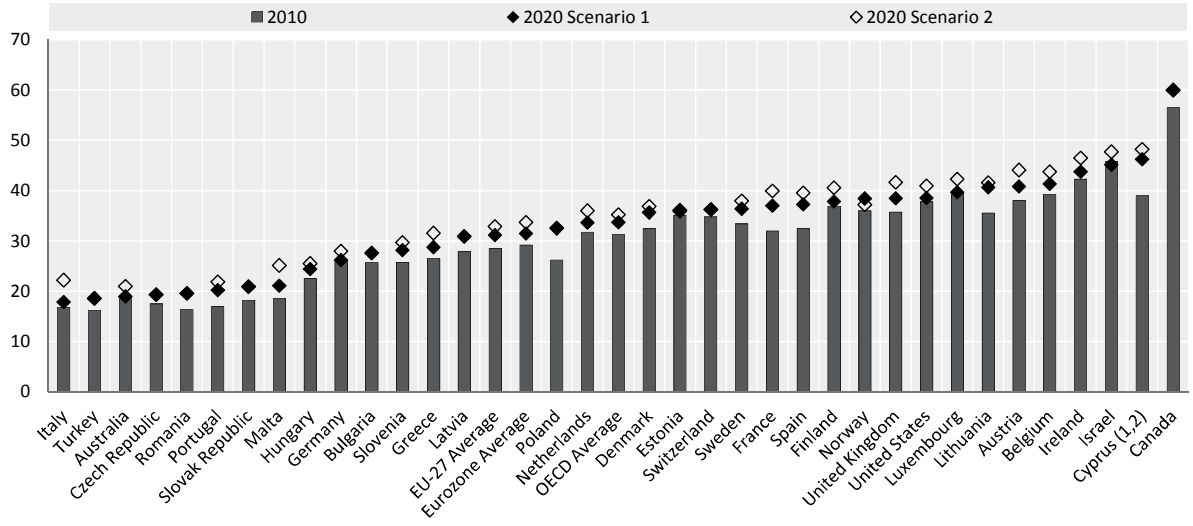
Source: European countries: Labour Force Surveys (Eurostat), 2000 and 2010; United States: 2000 Census and American Community Survey 2010; Canada: Survey of Labour and Income Dynamics, 1997-99 and 2007-09. Israel: Labour Force Survey, 2000 and 2010. Australia: Survey of Education and Work, 2001 and 2011. Projections: European countries: Eurostat EUROPOP2010 Population Projections. Other countries: World Population Prospects – 2010 Revision; all countries: ILO Estimates and Projections of the Economically Active Population 1990-2020.

These projections take on board progress in educational attainment by the different cohorts already in the labour market and assume for those aged 15-34 in 2020 either the same educational distribution of those aged 15-34 in 2010 (Scenario 1) or the predicted educational upgrade in 2020 (Scenario 2). Scenario 2 takes into account the increase in educational attainment of young cohorts between 2000 and 2010 and estimates the upgrade that will continue (see Annex 3.A2 for a detailed explanation of the methodology).

In both scenarios, the projections show increases in the share of highly educated individuals in the labour force in most OECD and EU countries (Figure 3.3). These increases come entirely from migration and cohort replacement effects as well as increases in labour force participation.

Figure 3.3. Share of tertiary-educated labour force in 2010 and under projection Scenarios 1 and 2 in 2020

Percentages



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The composition of projected changes in the educational attainment of the labour force

Figure 3.4 shows the demographic decomposition of the projected changes in educational attainment of the labour force from 2010 to 2020 under both scenarios and compared to the observed changes in educational attainment from 2000 to 2010 for the OECD, the European Union, the Eurozone as well as individual countries.[11]

Figure 3.4. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20

Thousands

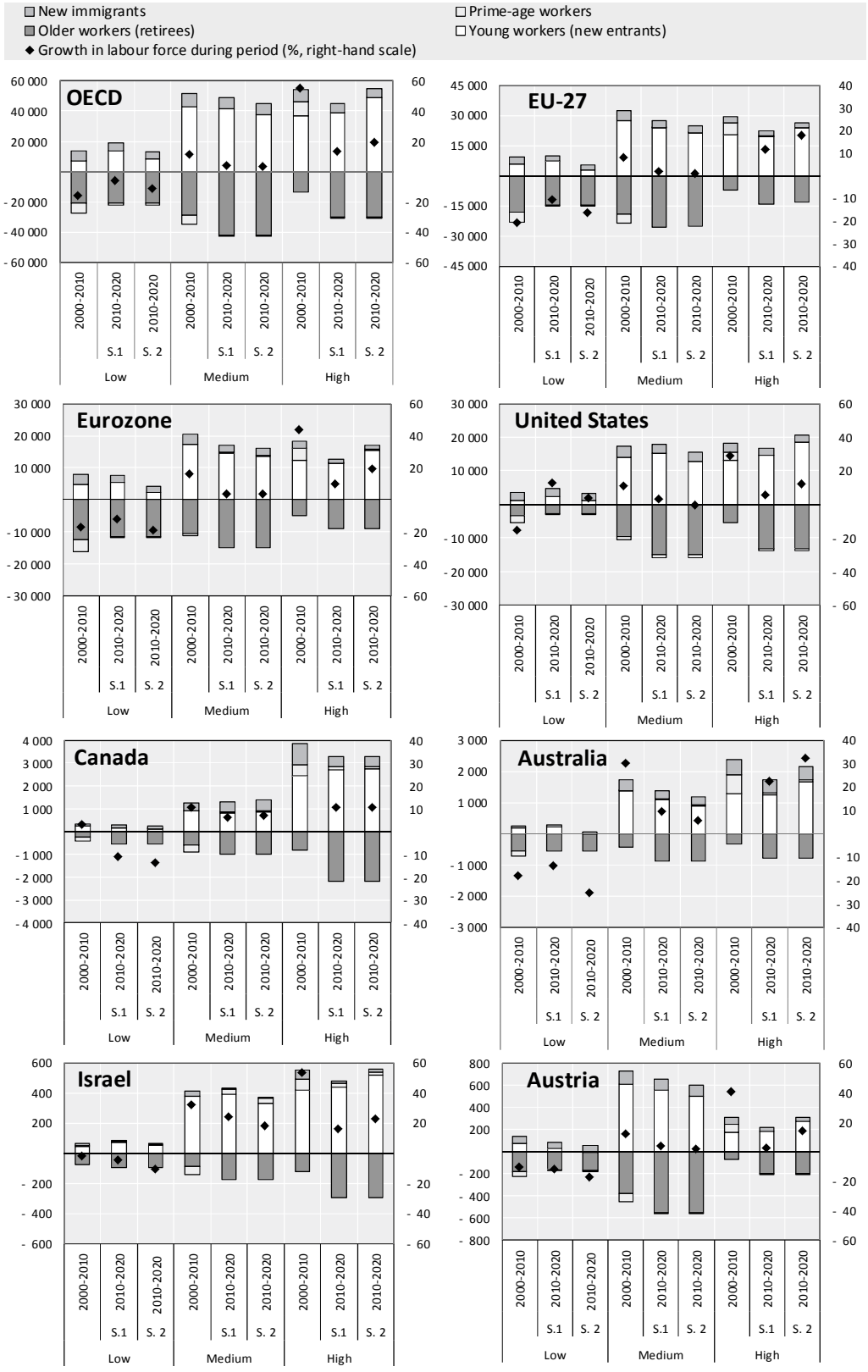


Figure 3.4. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20 *(cont.)*

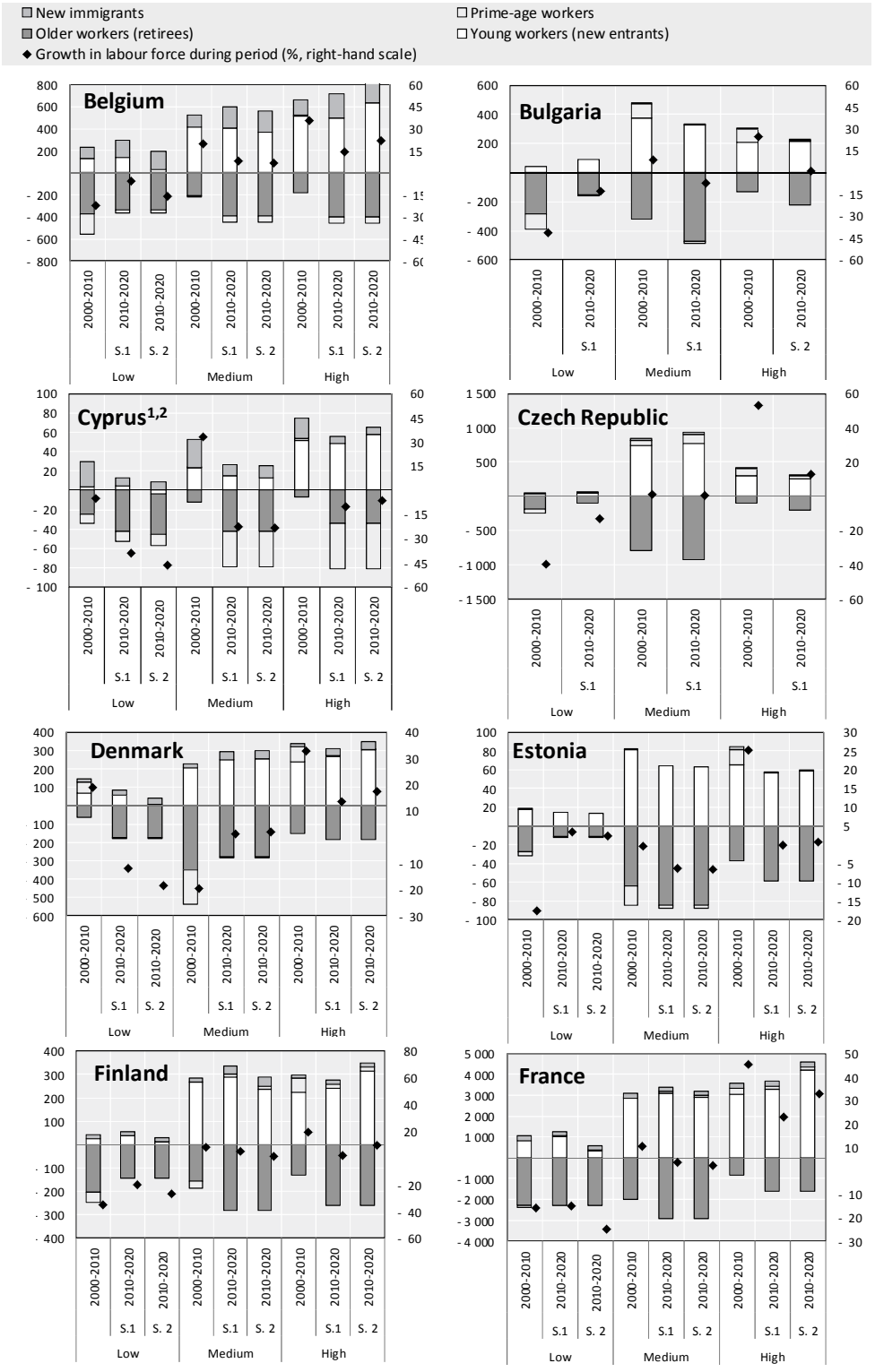


Figure 3.4. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20 *(cont.)*

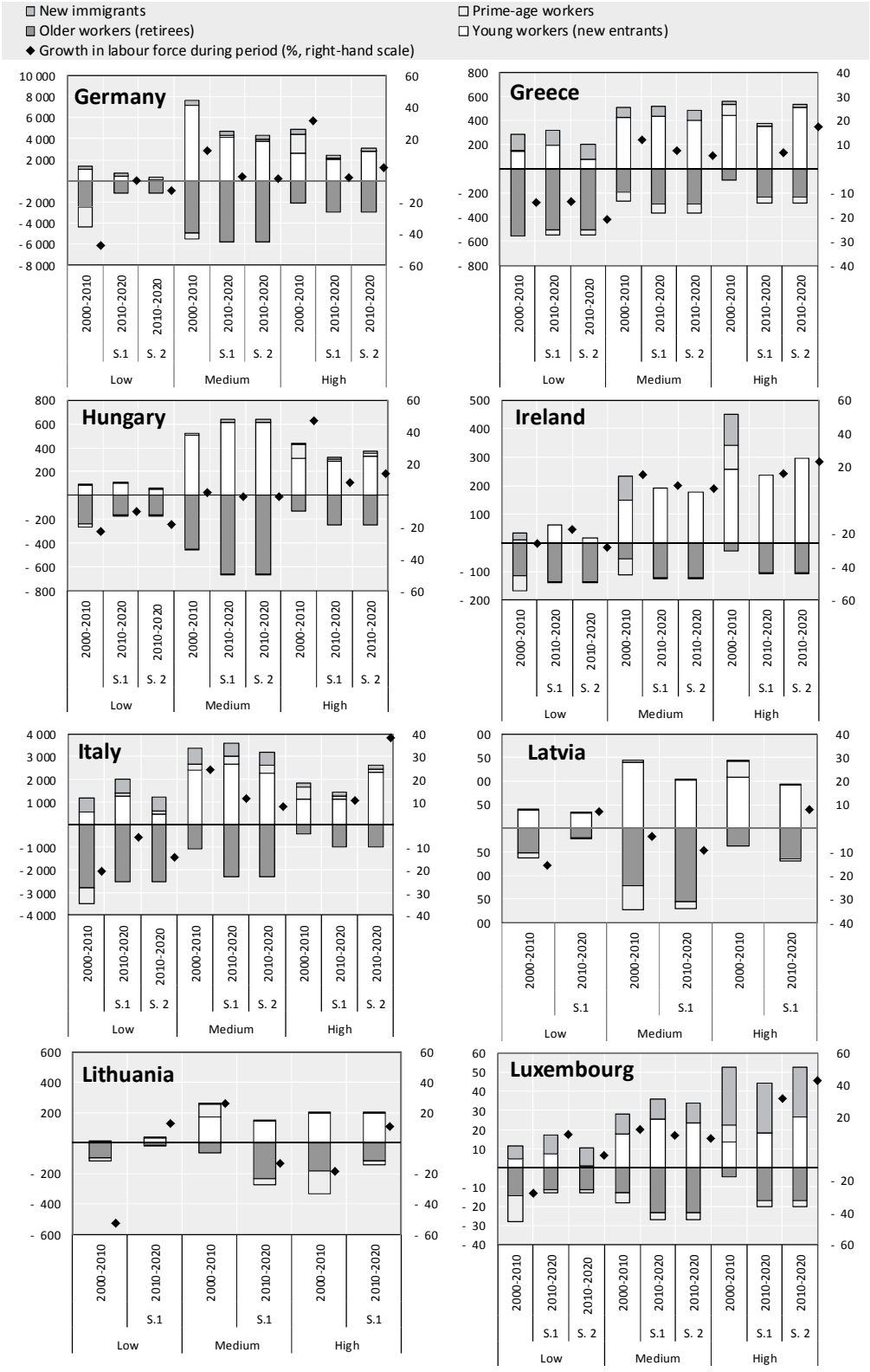


Figure 3.4. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20 *(cont.)*

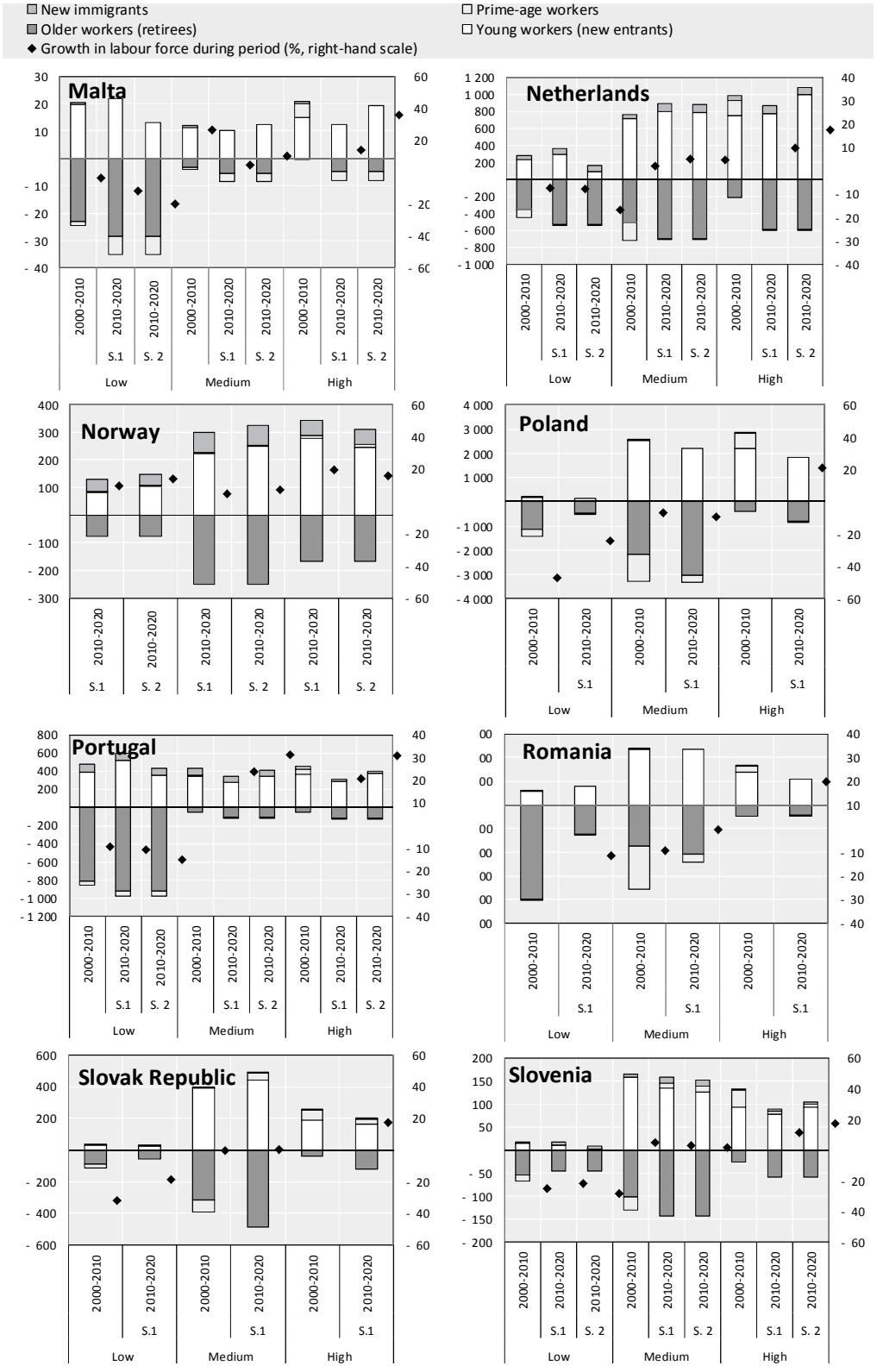
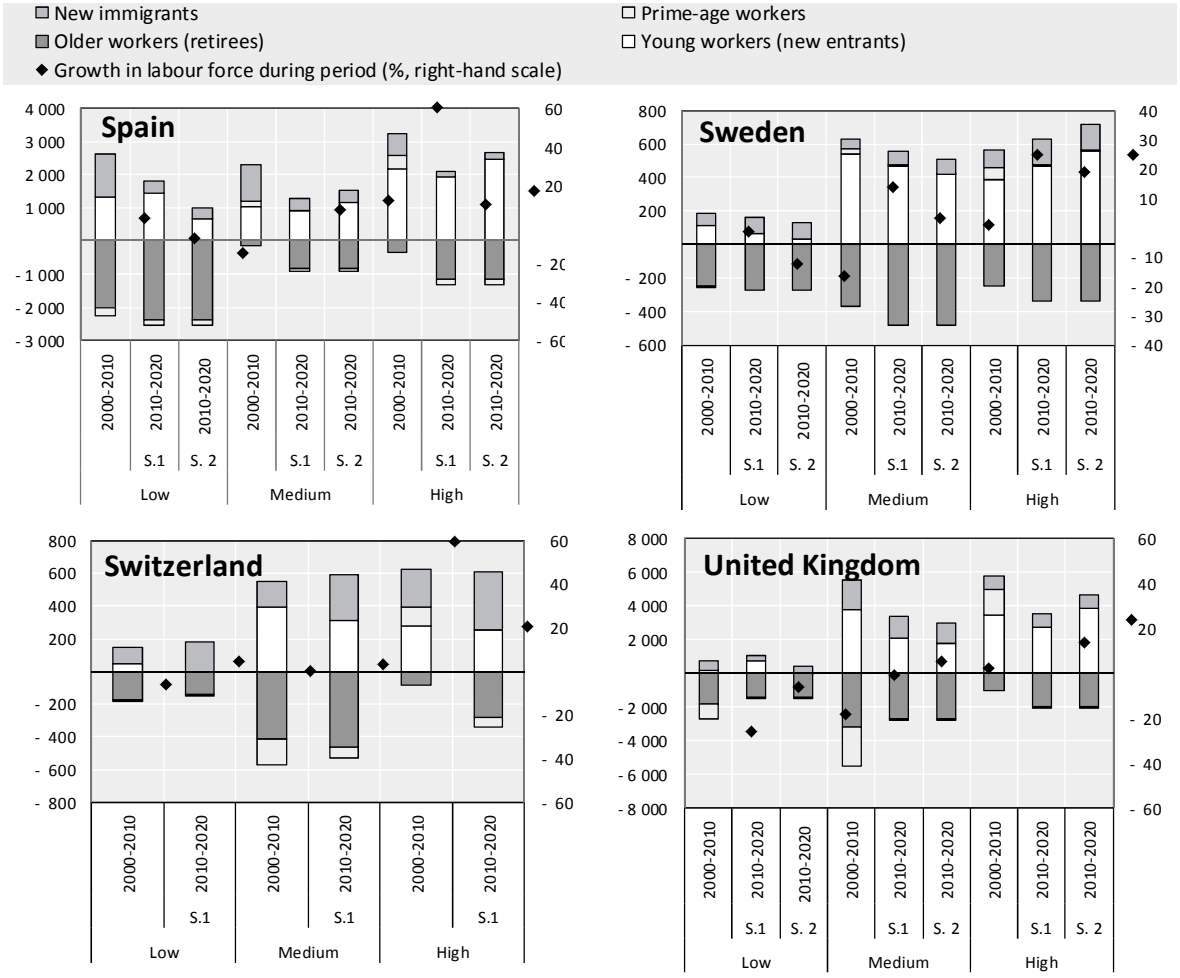


Figure 3.4. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20 *(cont.)*



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Fewer individuals with low educational attainment are projected to enter or leave the labour force between 2010 and 2020 under both scenarios. Indeed, with the retirement of older workers and with fewer new entries arriving through migration, this group is becoming small in many countries. Most of the expected changes occur will occur among individuals at medium or high education levels.

The most noteworthy change in the educational attainment of the labour force over the 2010-20 decade compared to the previous one is the much higher educational

attainment of retiring labour force cohorts. In practice, this means that the difference between the size of highly-educated entering cohorts and that of retiring ones will not be as large as it was observed over the previous decade. As a result, the size of the highly educated labour force will increase much more slowly under both scenarios.

Yet even at projected declines in migration levels and with increases in the highly-educated among retiring cohorts, the balance between entry and exit for the highly educated labour force is still expected to be positive in most countries for the 2010-20 period. The higher participation rates of the young would appear to more than offset the impact of the difference in size between entering and leaving working-age cohorts. Scenario 2 in addition projects a slightly higher contribution of young workers to the growth of the tertiary-educated labour force.

The relative composition of the change by educational level for each country under both scenarios is shown in Figures 3.5a, 3.5b and 3.5c. The tertiary-educated labour force is projected to increase on average by 13% in the coming decade under Scenario 1 and by 18% under Scenario 2 in OECD countries (Figure 3.5a). The projected increase between 2010 and 2020 under both scenarios is significantly smaller than the observed change of 41% between 2000 and 2010.

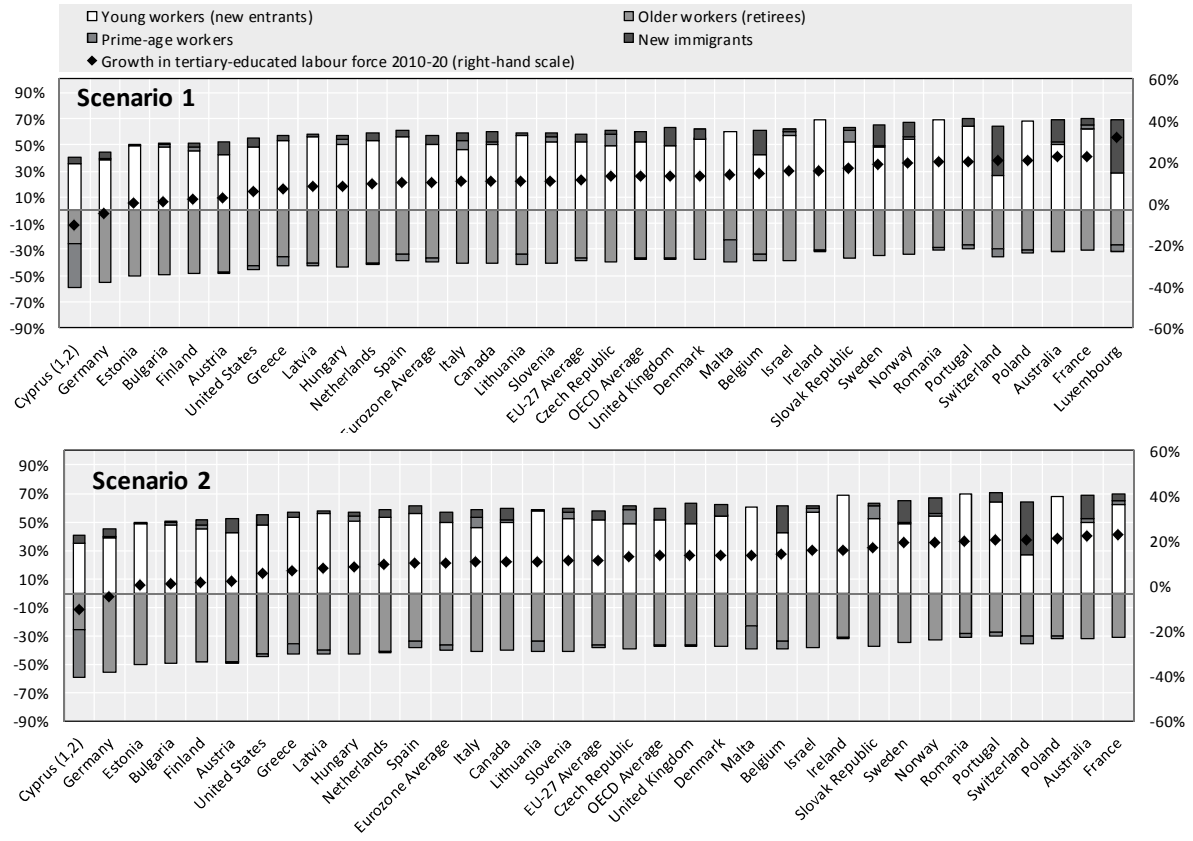
The relative size of the retiring cohort with tertiary education is projected to increase between 2010 and 2020 by over 70% compared to what was observed between 2000 and 2010. There is a replacement surplus projected for the labour force with tertiary education in the OECD on average under both scenarios. However, Scenario 1 projects a smaller replacement surplus than under Scenario 2 that takes into account the educational upgrade of those 15-34 in 2020.In the OECD, the ratio of new entrants over retirees in the labour force with tertiary education has decreased from 3.5 entrants for each retiree in the period 2000-10 to 1.4 under Scenario 1 and 1.7 under Scenario 2 during the period 2010-20. Although this only reflects the supply of skills, not the demand, labour shortages for the highly-skilled are more likely to arise in this context.

Under current migration assumptions migrants with a tertiary degree will account for only about 7% of the change in the total labour force from 2010-20. The average contribution of migration to new entries into the tertiary-educated labour force will be larger at over 10%. Still, this is a rather small contribution from migration and a decline from the 16% observed over the 2000-10 period. The role of tertiary-educated migrants will be more important in some countries, among them Luxembourg and Switzerland (almost 60% of the entries under Scenario 1), Sweden (24%), and the United Kingdom (22%).

The projections estimate a positive growth of the labour force with upper-secondary education on average in the OECD of 4% under Scenario 1 and 3% under Scenario 2 (Figure 3.5b). Immigrants will contribute positively to this growth: on average 8% of the flows (under Scenario 1) will come from migration. Based on the above assumptions, their contribution will be greater in countries like the United Kingdom (20%) and Spain and Luxembourg (17%).

The size of the labour force with less than upper-secondary attainment in the OECD is projected to decrease between 7% under Scenario 1 and 12% under Scenario 2 (Figure 3.5c), due largely to the retirement of older workers. Several OECD countries will see much higher decreases, like Cyprus (see notes 7 and 8), Poland, Slovenia or Finland.

Figure 3.5a. Composition of the change in the tertiary-educated labour force, by demographic group and by projection scenario, 2010-20

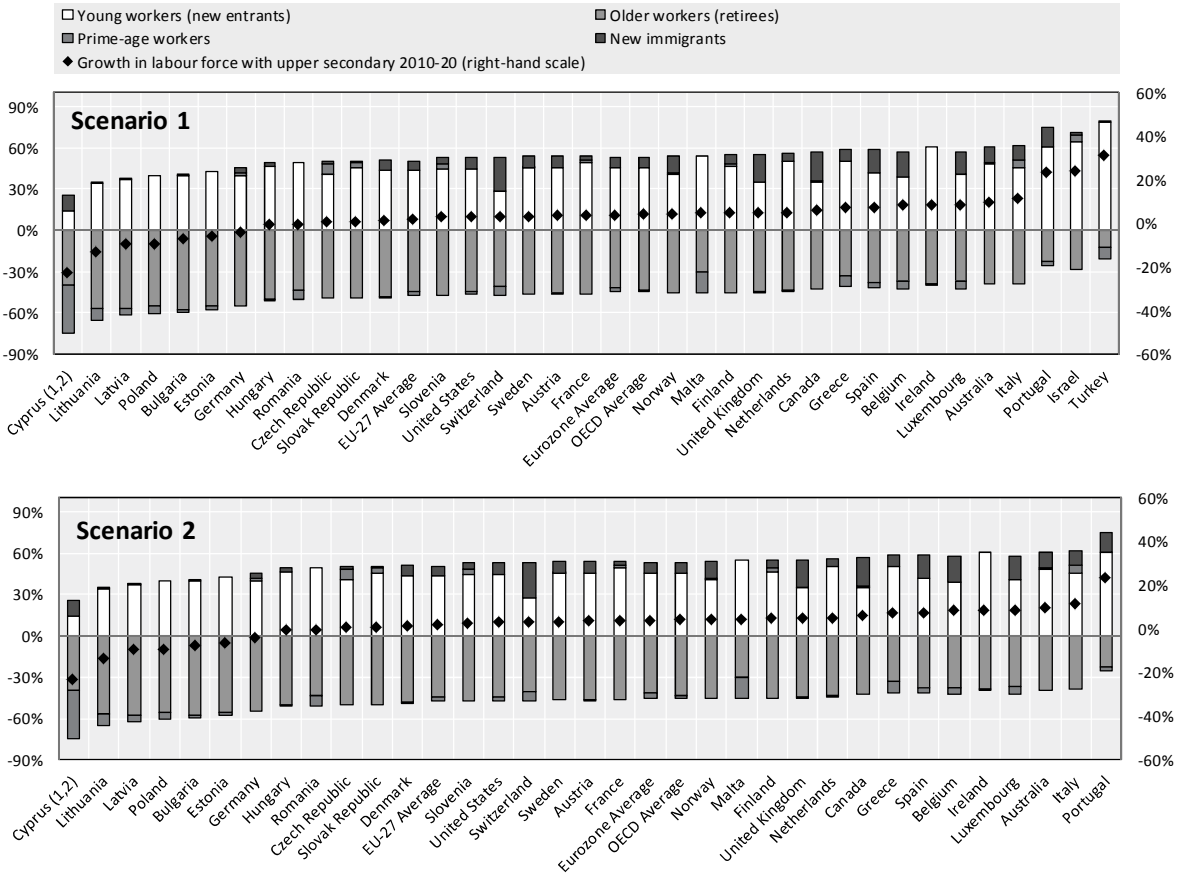


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Figure 3.5b. Composition of the change in the labour force with upper-secondary attainment, by demographic group, 2010-20

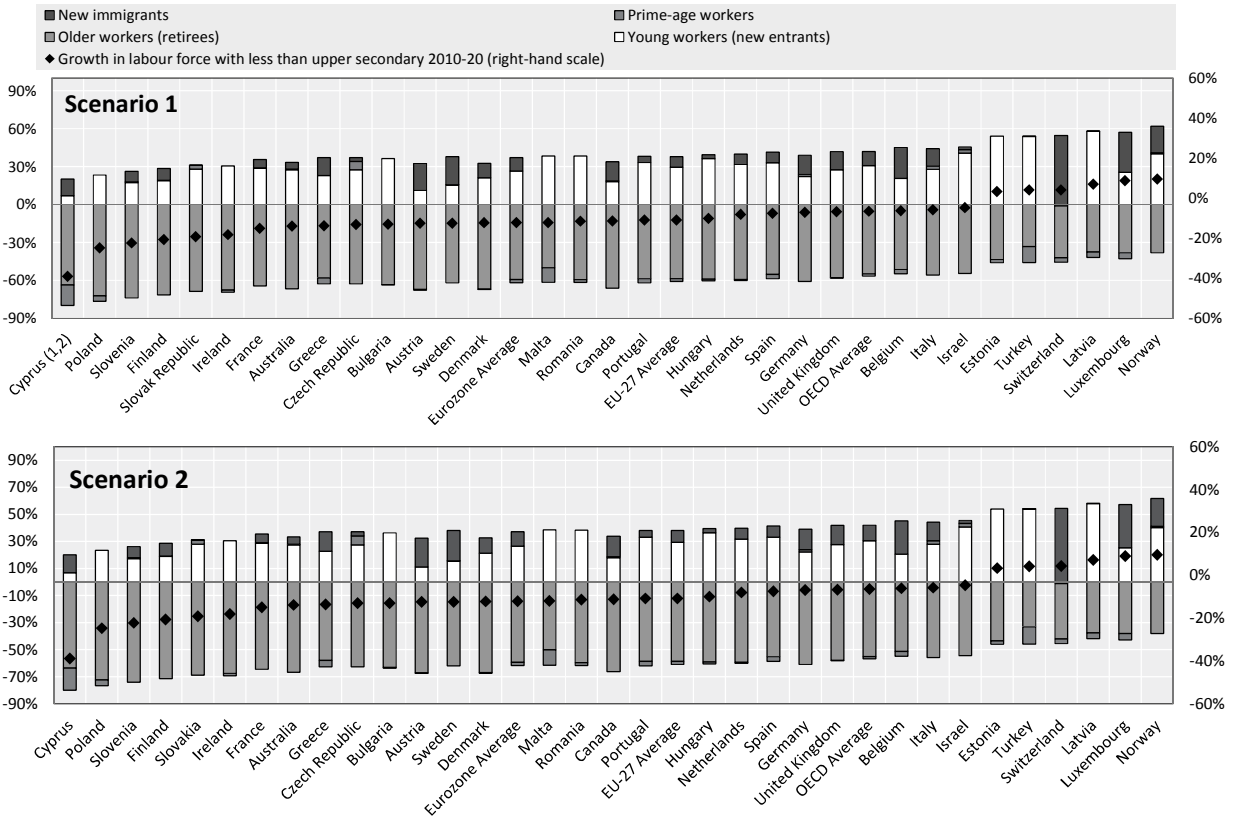


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Figure 3.5c. Composition of the change in the labour force with less than upper-secondary education, by demographic group, 2010-20



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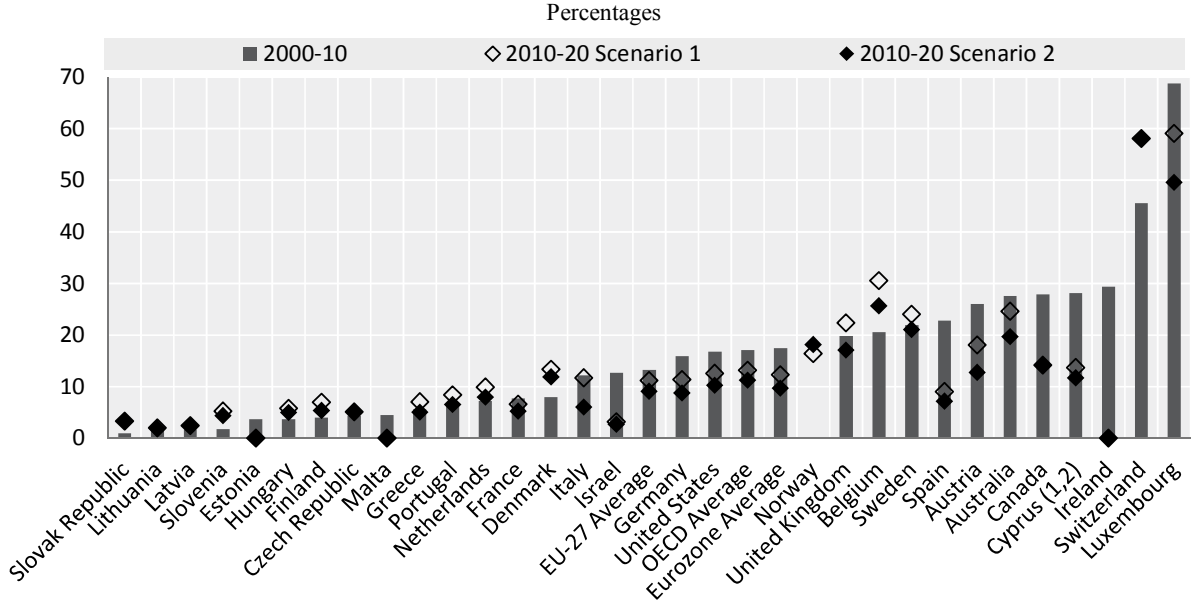
These migration projections build in a smaller role for migration in the growth of the working-age population and *a fortiori*, of labour force in the coming decade. Part of this may reflect the perceived effect of the economic crisis on migration, but perhaps also, a belief that any further increase in migration will be difficult to sell politically. Low migration levels are unlikely to be sustainable in the presence of strong growth and a labour force replacement deficit, or for that matter, a slowly increasing supply from domestic sources.

The period 2000-10 saw a significant contribution of low-educated migrants to the labour force, but this contribution decreases under a low-migration scenario. In the OECD migrants will contribute 27% of the entries under Scenario 1 and 39% under

Scenario 2 into the labour force with less than upper-secondary education in 2010-20, compared to 86% in 2000-10.

For the highly-skilled, the positive contribution of migration is projected to be between 9 (Scenario 1) and 11 (Scenario 2) percentage points lower than in the previous decade, with 13% (Scenario 1) and 11% (Scenario 2) of entries in the tertiary-educated labour force correspond to highly skilled immigrants (Figure 3.6). Under Scenario 2, highly skilled net migrant entries into the labour force will be half or less in 2010-20 in relative size compared to 2000-10 in Canada, Austria, Germany, Italy and Spain.

Figure 3.6. Contribution of migration to new entries in the tertiary-educated labour force, 2000-10 and 2010-20



1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: European countries: Labour Force Surveys (Eurostat), 2000 and 2010; United States: 2000 Census and American Community Survey 2010; Canada: Survey of Labour and Income Dynamics, 1997-99 and 2007-09. Israel: Labour Force Survey, 2000 and 2010. Australia: Survey of Education and Work, 2001 and 2011. Projections: European countries: Eurostat EUROPOP2010 Population Projections. Other countries: World Population Prospects – 2010 Revision; all countries: ILO Estimates and Projections of the Economically Active Population 1990-2020.

In summary, under current migration assumptions and projections of labour force participation as well two different scenarios about progression in educational attainment, the labour force will grow by up to 4% on average between 2010 and 2020 in the OECD, all of which will be accounted for by international migration. The most significant development affecting educational attainment developments over the decade will be the strong increase, compared to 2000-10, in retirement of highly educated workers. This means that the growth in the highly educated workforce observed in the previous decade

will decline substantially almost everywhere. This may create some skill bottlenecks in the face of persistent demand. However, at present there is considerable labour market slack which needs to be absorbed in many countries before labour markets start feeling the pinch of demographic developments. Even at the lower migration levels currently assumed, the highly educated labour force will nonetheless see positive growth in most countries over the decade.

3.4. Conclusion

This chapter has examined the role of demography in the educational change of the labour force, in order to shed some light on the role that immigrants have played and are projected to play in the future as labour markets respond to the retirement of baby-boomers and the entry of smaller youth cohorts into working life.

The educational attainment of both native- and foreign-born individuals in the labour force has increased and is expected to continue to increase in the near future, although at lower rates than in the past. In parallel, the share of the lower-educated labour force will shrink, with migrants nonetheless accounting for a large share of entries.

Current migration assumptions show projected lower migration inflows over 2010-20 than over the previous decade. These undoubtedly reflect expectations following the severe economic crisis of 2008-09. Even with these more limited migration scenarios, migration will continue to make a positive contribution to labour force growth over the decade.

Labour force growth is projected to be on average 4% in the OECD over the period 2010-20, much lower than in the previous decade. Migration inflows will account for all this observed positive labour force growth, even if those inflows will be significantly lower than in the previous decade. In the European Union, total labour force growth is projected to be almost zero over the period 2010-20, with migration contributing still positively at around 3% but in a lower scale than in the previous decade.

Growth in the share of highly educated workforce is expected to drop significantly, essentially because the growth in the number of the highly-educated who retire will increase substantially, a phenomenon that was not present over 2000-10. The ratio of new entrants to retirees in the labour force with tertiary education is projected to decrease from 3.5 entrants for each retiree in the period 2000-10 to 1.4 under Scenario 1 and 1.7 under Scenario 2 during the period 2010-20.

Although growth in the highly educated labour force is projected to remain positive for most countries, it will be lower than in the previous decade. This lower growth might imply an increase in the competition for talent among European and OECD countries, if all assumptions are correct, including those assigning a smaller role of migration among the highly educated labour force. Migration inflows for the decade 2010-20 are projected to be significantly smaller compared to the past. In addition, migrants are assumed to have the same educational attainment than in the previous decade. However, an increase in the educational attainment of the migrant labour force, in particular after changes in migration policies towards more selective regimes, could increase the contribution of migrants among the highly educated labour force.

In addition, the projections for the 2010-20 decade did not include the impact of potential increases in migration within the Europe Union, which is expected due to the end of transitional periods following enlargement to Romania and Bulgaria and as a result

of different initiatives undertaken to promote intra-EU worker mobility. As a result, the role of international migration depicted previously should be seen as a lower-bound estimate, notably concerning highly skilled workers for which OECD countries and emerging economies are increasingly competing.

Notes

1. Some persons who leave a particular educational group, for example, consist of persons who died or left the country over the observed period. The essential point is that they are no longer in the labour force at the end of the period. Likewise, some who enter an educational group are native-born expatriates who return from abroad; they also are not identified specifically.
2. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
3. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.
4. The group representing school completers excludes some persons who obtained a first tertiary degree after the age of 25. Persons in this situation show up in the estimates for the prime-age group.
5. The changes in the educational attainment of the labour force in 2000-10 for all the countries can be found in Table 3.A2.3.
6. EPDC projections are based on a multi-state projections method, and they are available mostly for developing countries only for the period 2005-25. IIASA (2007) educational projections are longer-term (2005-2050), focusing mostly on demographic trends and they are available for OECD countries.
7. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
8. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.
9. The distribution of migrant inflows between EU27 and non-EU27 countries is assumed to be the same in 2010-20 than the one observed in 2000-10.
10. Part of the high percentages observed at low education levels reflects the presence in the labour force of persons who have not yet completed their schooling.
11. See Table 3.A2.2. for a detailed table of the changes in the educational attainment of the labour force in 2000-10 and in 2010-20 under both projection scenarios.

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Annex 3.A1

Methodology for estimating the components of demographic change

The components of demographic change identified in this chapter are derived using some basic demographic accounting methods, applied to changes in educational attainment.

Roughly speaking, the method rests on the following general equality concerning the measure of change in a particular characteristic between time t1 and time t2:

$\Delta(T) = E + I + \Delta(PA) - R,$

where $\Delta(T)$=the Total change observed in the characteristic over the period, E = new non-immigrant entrants over the period, I = new immigrants who arrived over the period, $\Delta(PA)$ = change in the prime-age group over the period, and R= retirees over the period.

This amounts approximately to change =inflows – outflows, except that one allows for internal change in the stocks as well as distinguishing between internal inflows (new entrants) and external ones (immigration). External outflows (deaths and emigration) are included implicitly in each of the four components and are essentially netted out.

For almost all countries, the decomposition applied in this chapter to change over the 2000-10 period and to the *projected* change over 2010-20 are based on labour force survey data. We will describe the method in general for changes in the labour force, before explaining a number of technicalities resulting from its application to specific cases. The basic components are as follows

- New entrants = the labour force 15-34 in 2010 (2020), less persons 15-24 who were already in the labour force in the year 2000 (2010). This approximates young persons who entered the labour force over the period. It assumes that all persons 15-24 who were part of the labour force in 2000 are still in the labour force ten years later, when they are 25-34 years of age.
- Retirees = the labour force 45+ in 2000 (2010) less the labour force 55+ in 2010 (2020). Temporary withdrawals and re-entries prior to definitive retirement are implicitly netted out.
- Prime-age workers = the labour force 35-54 in 2010 (2020), less the labour force 25-44 in 2000 (2010)
- New immigrants = For 2010, immigrants in 2010 with duration of residence of ten years or less. Note that this implies that this group has to be excluded from all the other components above involving 2010 data, to avoid double-counting. For 2020, projected number of net immigrants in 2020, computed as the difference between the medium variant projections and zero migration projections in 2020. For further details see Annex 3.A2.

As can be verified, the net change in the labour force 15 years of age and older is the sum of these four components, and the sum is perfectly additive, modulo non-response.

The decomposition of change described above can be applied to each educational attainment level within the labour force. However, new entrants now have a more precise meaning, namely persons who completed their education over the period and entered the labour force, provided one excludes persons still in education from the calculation. The change for prime-age workers represents educational upgrading for this group as well as, implicitly, loss due to emigration or death.

New entrants are now estimated as follows: for 2010, persons 15-24 not in education in 2010 + (persons 25-34 in 2010 – persons 15-24 not in education in 2000), for each educational attainment level.

The first term consists of persons who in principle have completed their education by 2010. For the second term, not all persons 25-34 have completed their education. However, since it is tertiary attainment that is of interest, it is assumed that persons 25-34 who are still in education will already have at least a first tertiary degree. The tertiary attainment levels of those who do not (and there are some) will show up as educational upgrading among persons who are 25-44 in 2000 and 35-54 in 2010. This is not ideal, but it is difficult to take into account sensibly situations in which a first tertiary degree is completed without interruption at a late age.

From the population of persons 25-34 in 2010, one subtracts persons from the same cohort who had already completed their education in 2000, namely persons 15-24 not in education.

This kind of decomposition is carried out for each educational level, to provide an indication of the demographics of change in each level.

Annex 3.A2

Methodology for estimating the projected educational attainment of the workforce in 2020

The educational attainment of the labour force in 2020 is estimated in three steps. The first step constructs the shares of each educational group in the labour force by birth status, age group and gender. The second step estimates the size of the labour force by birth status, age group and gender, and finally the third step estimates the actual size of the labour force for each educational group by birth status, age group and gender.

The educational attainment rates of the labour force in 2020 by birth status, age group and gender are estimated using information from the labour force surveys for the Eurostat labour force survey for the EU countries, Israeli labour force survey for Israel, ACS for the United States, SLID for Canada and the Survey of Education and Work for Australia. The educational attainment rates of those individuals aged 25-54 in 2010 (by birth status, age group and gender) are applied to those individuals aged 35-64 in 2020. Most of those aged 25-54 in 2010 have already finished their studies; it is assumed that they will change their educational attainment at best marginally by 2020 when aged 35-64.

Two different educational distribution scenarios are assumed for those residents aged 15-34 in 2020 in each country. Under the first scenario, we assume that those aged 15-34 in 2020 (by gender and age group) will have the same educational distribution than those aged 15-34 in 2010.

The first scenario thus assumes no increase in attainment levels over the period for persons having completed their studies in 2010 and no further progress for the cohort 15-34 in 2020 compared to the 15-34 cohort in 2010. The projections of educational attainment under Scenario 1 are a lower bound, which might underestimate progress in educational attainment.

Under the second scenario, the educational attainment of 15-34 in 2020 (by gender and age group) is estimated as follows:

- The share of individuals in each educational attainment (low, medium and high) in 2010 is estimated as a function of the share in 2000, its square and controlling for age and gender;[1]
- Afterwards, the share of individuals in each educational attainment in 2020 is estimated as a function of the share in 2010 using the coefficients obtained previously.

We assume the same average educational attainment of newly arrived migrants in 2000-10 than in 2010-20 (by gender and age group).

Net inflows of foreign-born of working age during the period 2000-10 by age, gender and region of origin (EU27 versus non-EU27 for European Union countries only) are estimated using information from the Eurostat labour force survey for the EU countries, Israeli labour force survey for Israel, ACS for the United States, SLID for Canada and the Survey of Education and Work for Australia.

Net inflows of foreign-born of working age during the period 2010-20 are estimated as a (constant) proportion of net migration flows, as net inflows of foreign-born are a component of net migration flows. Net migration flows in 2020 (by gender and age group) are computed as the difference between the medium-variant projection assuming normal migration and the one assuming zero migration[2] from the World Population Prospects 2010 data for the United States, Canada, Israel and Australia and from the Eurostat Population Projections 2010 (EUROPOP2010) for European countries.

Net inflows of foreign-born are estimated correcting for the fact that outflows of foreign-born and inflows and outflows of native-born are also included in net migration projections as follows:

- For the period 2000-10, net inflows foreign-born 2000-10 are obtained from labour force survey data and net migration 2000-10 from EUROPOP and WPP data, and the first are approximated as a constant share of the latter.
- For the period 2010-20, net inflows foreign-born 2010-20 are estimated as the same fraction of net migration 2010-20 than in the previous decade.

Annex Table 3.A2.1 shows the observed net migration and net inflows of foreign-born in 2000-10 as well as the projected net migration and net inflows of foreign-born in 2010-20.

This approximation takes into account the changes in the sizes of net migration in 2000-10 and the projected ones in 2010-20. That is, if net migration flows are projected to decrease in the coming decade, net inflows of foreign-born will be reduced accordingly. It assumes however that the relation between net migration and net inflows of foreign-born is constant and has the same sign in both decades. In other terms, it assumes that all the net flows of foreign-born and native-born in the net migration component move in the same direction and at the same rate. If inflows and outflows of foreign-born and native-born do not move in the same direction, the assumption is not realistic. For example, if native-born leave the country as a response to foreign-born inflows, net flows of foreign-born will increase while net flows of native-born will decrease. However, it seems plausible to assume that the motivations that induce foreign-born to enter a country (greater relative incomes, lower unemployment, the existence of labour shortages) should induce also the native-born not to leave it and are much greater than any potential displacement effects caused by inflows of foreign-born.

The projected share of foreign-born inflows of working age during the period 2010-20 from EU27 and non-EU27 (for European Union countries only) is projected to be the same as the one observed during 2000-10 (by age and gender). This conservative assumption does not include potential increases in intra-EU mobility due to the different initiatives undertaken to promote mobility within the European Union and should be considered as a lower bound.

Labour force projections for 2020 by birth status are estimated using population projections as well as labour force participation rates. Population projections are computed using specific assumptions regarding fertility, mortality and migration from Eurostat Population Projections 2010 (EUROPOP2010) for European countries and the *UN World Population Prospects 2010* (United Nations, 2011) for the United States, Canada, Israel and Australia.

Projected labour force participation rates (LFPR) by age group and gender in 2020 are obtained from the *ILO Estimates and Projections of the Economically Active Population: 1990-2020* (ILO, 2011). In order to differentiate between the LFPRs of native- and foreign-born populations, we assume that the differential participation rate between

foreign- and native-born in 2020 will be the same as observed in 2010, and we apply it to the overall projected participations rates in 2020.

Table 3.A2.1. Observed and projected net migration and net inflows of foreign-born, 2000-10 and 2010-20

Thousands

	Net migration		Inflows of foreign-born	
	2000-10	2010-20	2000-10	2010-20
Australia	257	178	358	889
Austria	1 207	942	1 139	247
Belgium	260	358	540	743
Bulgaria	- 63	- 78	5	6
Canada	1 520	1 334	1 474	1 294
Cyprus[1,2]	75	28	95	35
Czech Republic	211	220	71	74
Denmark	90	77	155	133
Estonia	1	- 5	5	0
Finland	70	90	68	88
France	820	532	1 227	796
Germany	872	528	1 966	1 190
Greece	232	211	329	299
Hungary	97	174	44	79
Ireland	201	- 14	353	0
Israel	235	59	191	48
Italy	2 528	2 317	2 167	1 987
Latvia	- 21	- 13	8	5
Lithuania	- 49	- 65	6	8
Luxembourg	39	35	62	56
Malta	10	- 3	4	0
Netherlands	131	153	240	280
Norway	159	187	168	199
Poland	- 34	117	26	0
Portugal	221	179	258	210
Romania	- 210	37	3	0
Slovak Republic	32	77	6	15
Slovenia	31	62	14	27
Spain	3 459	1 107	3 722	1 191
Sweden	274	297	365	395
Switzerland	251	384	608	929
Turkey	- 102	- 24	442	103
United Kingdom	1 313	1 291	3 012	2 963
United States	7 459	6 511	11 558	10 089
Eurozone average	**10 278**	**6 678**	**12 345**	**7 296**
EU-27 average	**11 798**	**8 656**	**15 890**	**10 827**
OECD average	**21 835**	**17 379**	**30 568**	**24 323**

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Source: European countries: Labour Force Surveys (Eurostat), 2000 and 2010; United States: 2000 Census and American Community Survey 2010; Canada: Survey of Labour and Income Dynamics, 1997-99 and 2007-09. Israel: Labour Force Survey, 2000 and 2010. Australia: Survey of Education and Work, 2001 and 2011. Projections: European countries: Eurostat EUROPOP2010 Population Projections. Other countries: World Population Prospects – 2010 Revision; all countries: ILO Estimates and Projections of the Economically Active Population 1990-2020.

Table 3.A2.2. Distribution of educational attainment of the immigrant labour force (2010), by region of origin (EU27 vs. non-EU27) and evolution 2000-10

	EU-27 Immigrants						Change in share 2000-10					
	Distribution 2010			Compared to Non EU-27 immigrants			EU-27 Immigrants			Non EU-27 immigrants		
	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
	Percentages			Percentage points			Percentage points			Percentage points		
Austria	11	59	30	-26	10	16	-2	1	1	-12	7	5
Belgium	27	32	41	-11	1	10	-13	1	12	-1	2	-1
Bulgaria	-	-	-									
Cyprus[1,2]	21	43	36	-15	10	5	4	7	-11	3	-1	-1
Czech Republic	13	64	23	2	0	-1						
Denmark	15	37	49	-15	-2	18	-2	-15	17	5	-10	5
Estonia	-	(38)	(50)									
Finland	21	53	26	-7	8	-1						
France	41	34	25	1	2	-4	-11	4	7	-5	1	4
Germany	27	47	27	-21	12	9						
Greece	31	49	19	-22	14	8	9	0	-9	11	-4	-7
Hungary	13	54	33	-2	7	-6	-13	17	-5	6	17	-22
Ireland	15	42	43	9	15	-24	-19	12	7			
Italy	30	57	13	-19	18	1						
Latvia	(20)	55	(25)	14	-11	-3						
Lithuania	-	-	-									
Luxembourg	23	30	46	2	-3	0	-23	1	22	-21	0	21
Malta	48	23	29	2	-5	3						
Netherlands	24	36	40	-11	-1	12	-8	0	8	-8	1	7
Norway	13	42	45	-18	9	9						
Poland	-	(51)	(47)									
Portugal	38	35	27	-13	4	9	-17	7	10	-9	7	2
Romania	-	-	-									
Slovak Republic	-	57	30									
Slovenia	(11)	(58)	(31)									
Spain	31	40	30	-17	8	9	-9	13	-4	0	7	-8
Sweden	20	39	41	-10	3	7	-2	-8	10	2	-9	7
Switzerland	23	36	41	-9	-6	15						
United Kingdom	14	54	32	-1	10	-10	-12	18	-6	-12	15	-4
Eurozone average	**27**	**43**	**32**	**-9**	**4**	**5**	**-8**	**7**	**3**	**-7**	**5**	**2**
EU-27 average	**24**	**45**	**33**	**-7**	**3**	**3**	**-8**	**7**	**2**	**-5**	**7**	**0**

Note: Labour force includes active population aged 15-64. The sign '-' corresponds to data cells that do not meet Eurostat threshold for publication, cells with numbers in brackets under Eurostat threshold b, empty cells if data not available. The fourth, fifth and sixth columns subtract the share of EU27 migrants in each educational attainment to the share of non-EU27 migrants.

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Source: Labour Force Surveys (Eurostat), 2000-2010.

Table 3.A2.3. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20

	Educational level	Scenario	Year	Young workers (new entrants)	Older workers (retirees)	Prime-age workers	New immigrants			Growth in labour force during period (%)
							Total	EU 27	Non-EU 27	
OECD	Low		2000-2010	7 146	-20 709	-6 966	6 467			-16
		S.1	2010-2020	13 955	-20 561	-1 326	5 196			-7
		S. 2	2010-2020	8 053	-20 561	-1 326	5 196			-12
	Medium		2000-2010	42 788	-28 911	-5 667	9 076			11
		S.1	2010-2020	41 459	-41 885	- 842	7 461			4
		S. 2	2010-2020	37 523	-41 885	- 842	7 461			3
	High		2000-2010	37 045	-13 621	9 529	7 535			55
		S.1	2010-2020	39 132	-30 167	- 645	5 715			13
		S. 2	2010-2020	48 973	-30 167	- 645	5 715			19
EU-27	Low		2000-2010	5 870	-18 458	-4 863	3 675	990	2 682	-21
		S.1	2010-2020	7 161	-14 771	- 192	2 524	850	1 674	-11
		S. 2	2010-2020	2 989	-14 771	- 192	2 524	850	1 674	-16
	Medium		2000-2010	27 124	-18 986	-4 860	5 006	2 211	2 792	8
		S.1	2010-2020	23 671	-25 899	46	3 534	1 274	2 259	1
		S. 2	2010-2020	21 274	-25 016	19	3 534	1 274	2 259	1
	High		2000-2010	20 134	-7 263	6 347	3 038	1 159	1 878	49
		S.1	2010-2020	19 477	-14 173	135	2 303	825	1 477	11
		S. 2	2010-2020	23 735	-13 380	73	2 303	825	1 477	18
Eurozone	Low		2000-2010	4 924	-12 572	-3 509	3 126	761	2 363	-17
		S.1	2010-2020	5 495	-11 325	- 131	2 029	666	1 362	-12
		S. 2	2010-2020	2 157	-11 325	- 131	2 029	666	1 362	-19
	Medium		2000-2010	17 463	-10 533	- 594	3 103	1 312	1 789	16
		S.1	2010-2020	14 460	-15 030	410	2 116	713	1 402	4
		S. 2	2010-2020	13 591	-15 030	410	2 116	713	1 402	3
	High		2000-2010	12 434	-4 826	3 784	2 138	877	1 260	44
		S.1	2010-2020	11 331	-8 922	85	1 291	444	846	10
		S. 2	2010-2020	15 560	-8 922	85	1 291	444	846	19
Australia	Low		2000-2010	204	- 565	-149	62			-18
		S.1	2010-2020	227	- 554	6	44			-14
		S. 2	2010-2020	1	- 554	6	44			-25
	Medium		2000-2010	1 374	- 420	2	345			30
		S.1	2010-2020	1 082	- 884	27	263			9
		S. 2	2010-2020	891	- 884	27	263			6
	High		2000-2010	1 292	- 319	598	493			78
		S.1	2010-2020	1 253	- 793	61	409			22
		S. 2	2010-2020	1 670	- 793	61	409			32
Austria	Low		2000-2010	71	- 183	-47	60	13	48	-11
		S.1	2010-2020	27	- 164	-1	52	22	30	-13
		S. 2	2010-2020	- 7	- 164	-1	52	22	30	-18
	Medium		2000-2010	605	- 386	-69	121	69	52	11
		S.1	2010-2020	549	- 554	-2	103	43	60	3
		S. 2	2010-2020	494	- 554	-2	103	43	60	1
	High		2000-2010	174	- 73	70	61	37	24	40
		S.1	2010-2020	178	- 200	-1	39	17	23	2
		S. 2	2010-2020	269	- 200	-1	39	17	23	14
Belgium	Low		2000-2010	128	- 370	-189	105	40	66	-23
		S.1	2010-2020	136	- 340	-23	162	71	91	-6
		S. 2	2010-2020	34	- 340	-23	162	71	91	-16
	Medium		2000-2010	413	- 209	-13	111	56	56	19
		S.1	2010-2020	407	- 389	-56	189	83	106	8
		S. 2	2010-2020	373	- 389	-56	189	83	106	6
	High		2000-2010	516	- 178	13	134	79	55	35
		S.1	2010-2020	497	- 398	-58	219	96	122	14
		S. 2	2010-2020	634	- 398	-58	219	96	122	21

Table 3.A2.3. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20
(cont.)

	Educational level	Scenario	Year	Young workers (new entrants)	Older workers (retirees)	Prime-age workers	New immigrants			Growth in labour force during period (%)
							Total	EU 27	Non-EU 27	
Bulgaria	**Low**		2000-2010	44	-287	-104	0.0	0.0	0.0	-41
		S.1	2010-2020	87	-152	-1	0.0	0.0	0.0	-13
	Medium		2000-2010	376	-320	99	0.5	0.0	0.5	8
		S.1	2010-2020	324	-469	-14	2.0	0.2	1.7	-8
	High		2000-2010	207	-132	95	0.9	0.2	0.7	24
		S. 2	2010-2020	216	-221	8	2.8	0.2	2.5	1
Canada	**Low**		2000-2010	233	- 263	- 158	117			3
		S.1	2010-2020	151	- 553	5	127			-11
		S. 2	2010-2020	89	- 553	5	127			-14
	Medium		2000-2010	912	- 574	- 318	354			10
		S.1	2010-2020	811	-992	30	480			6
		S. 2	2010-2020	858	-992	30	480			7
	High		2000-2010	2 456	- 800	451	950			79
		S.1	2010-2020	2 721	-2 187	109	449			10
		S. 2	2010-2020	2 735	-2 187	109	449			10
Cyprus[1,2]	**Low**		2000-2010	3	-24	-10	26	9	17	-6
		S.1	2010-2020	5	-42	-11	9	4	5	-39
		S. 2	2010-2020	-3	-42	-11	9	4	5	-47
	Medium		2000-2010	23	-12	1	29	16	13	33
		S.1	2010-2020	15	-42	-37	12	5	7	-23
		S. 2	2010-2020	13	-42	-37	12	5	7	-24
	High		2000-2010	51	-7	3	20	10	10	79
		S.1	2010-2020	48	-35	-47	8	3	4	-11
		S. 2	2010-2020	57	-35	-47	8	3	4	-7
Czech Republic	**Low**		2000-2010	39	-192	-60	6	2	4	-40
		S.1	2010-2020	44	-101	10	5	3	2	-13
	Medium		2000-2010	740	-791	76	35	20	15	1
		S.1	2010-2020	765	-929	137	37	19	18	0
	High		2000-2010	295	-104	114	13	8	6	53
		S.1	2010-2020	257	-205	49	14	7	7	13
Denmark	**Low**		2000-2010	68	-63	61	16	2	14	19
		S.1	2010-2020	55	-174	-1	30	10	20	-12
		S. 2	2010-2020	9	-174	-1	30	10	20	-19
	Medium		2000-2010	204	-351	-189	22	6	17	-20
		S.1	2010-2020	249	-277	-2	43	14	29	1
		S. 2	2010-2020	258	-277	-2	43	14	29	2
	High		2000-2010	239	-149	81	21	9	12	33
		S.1	2010-2020	268	-188	1	41	13	28	13
		S. 2	2010-2020	305	-188	1	41	13	28	17
Estonia	**Low**		2000-2010	18	-28	-4	0.3	0.3	0.0	-18
		S.1	2010-2020	14	-11	-1	0.0	0.0	0.0	3
		S. 2	2010-2020	13	-11	-1	0.0	0.0	0.0	2
	Medium		2000-2010	82	-64	-21	0.7	0.2	0.5	0
		S.1	2010-2020	64	-84	-4	0.0	0.0	0.0	-6
		S. 2	2010-2020	63	-84	-4	0.0	0.0	0.0	-7
	High		2000-2010	65	-37	16	2.5	1.1	1.4	25
		S.1	2010-2020	57	-58	1	0.0	0.0	0.0	0
		S. 2	2010-2020	58	-58	1	0.0	0.0	0.0	1

Table 3.A2.3. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20
(cont.)

	Educational level	Scenario	Year	Young workers (new entrants)	Older workers (retirees)	Prime-age workers	New immigrants			Growth in labour force during period (%)
							Total	EU 27	Non-EU 27	
Finland	**Low**		2000-2010	26	- 204	-44	16	6	10	-36
		S.1	2010-2020	37	- 142	1	19	6	13	-21
		S. 2	2010-2020	12	- 142	1	19	6	13	-27
	Medium		2000-2010	266	- 155	-30	20	8	13	7
		S.1	2010-2020	287	- 280	13	36	12	24	4
		S. 2	2010-2020	239	- 280	13	36	12	24	1
	High		2000-2010	222	- 131	64	9	3	6	19
		S.1	2010-2020	241	- 260	17	18	6	12	2
		S. 2	2010-2020	316	- 260	17	18	6	12	9
France	**Low**		2000-2010	802	-2 268	- 129	270	70	200	-16
		S.1	2010-2020	1 025	-2 307	19	230	63	167	-15
		S. 2	2010-2020	342	-2 307	19	230	63	167	-25
	Medium		2000-2010	2 834	-1 998	14	226	65	161	10
		S.1	2010-2020	3 114	-2 931	85	183	50	133	4
		S. 2	2010-2020	2 899	-2 931	85	183	50	133	2
	High		2000-2010	3 029	- 851	303	254	67	187	45
		S.1	2010-2020	3 300	-1 622	147	233	63	170	23
		S. 2	2010-2020	4 204	-1 622	147	233	63	170	33
Germany	**Low**		2000-2010	1 080	-2 436	-1 919	366	110	256	-48
		S.1	2010-2020	424	-1 167	33	291	99	192	-7
		S. 2	2010-2020	59	-1 167	33	291	99	192	-13
	Medium		2000-2010	7 143	-4 946	- 528	457	219	239	12
		S.1	2010-2020	4 136	-5 745	208	353	120	233	-4
		S. 2	2010-2020	3 791	-5 745	208	353	120	233	-6
	High		2000-2010	2 634	-2 127	1 776	499	233	267	31
		S.1	2010-2020	2 061	-2 963	76	264	90	175	-5
		S. 2	2010-2020	2 772	-2 963	76	264	90	175	1
Greece	**Low**		2000-2010	142	- 558	9	138	23	115	-14
		S.1	2010-2020	198	- 504	-42	125	28	96	-14
		S. 2	2010-2020	83	- 504	-42	125	28	96	-21
	Medium		2000-2010	424	- 191	-75	82	28	54	12
		S.1	2010-2020	439	- 292	-72	80	20	61	7
		S. 2	2010-2020	400	- 292	-72	80	20	61	5
	High		2000-2010	440	- 93	92	26	7	19	53
		S.1	2010-2020	353	- 237	-48	27	7	20	7
		S. 2	2010-2020	507	- 237	-48	27	7	20	17
Hungary	**Low**		2000-2010	86	-241	-19	3	3	1	-23
		S.1	2010-2020	101	-164	-4	9	7	2	-10
		S. 2	2010-2020	51	-164	-4	9	7	2	-19
	Medium		2000-2010	504	-451	0	14	11	3	2
		S.1	2010-2020	610	-659	-9	30	22	8	-1
		S. 2	2010-2020	611	-659	-9	30	22	8	-1
	High		2000-2010	317	-134	112	12	10	2	47
		S.1	2010-2020	284	-243	19	17	13	4	8
		S. 2	2010-2020	332	-243	19	17	13	4	13
Ireland	**Low**		2000-2010	11	-116	-52	25	22	4	-26
		S.1	2010-2020	62	-136	-4	0	0	0	-18
		S. 2	2010-2020	17	-136	-4	0	0	0	-29
	Medium		2000-2010	148	-55	-59	86	71	16	15
		S.1	2010-2020	193	-124	-2	0	0	0	8
		S. 2	2010-2020	178	-124	-2	0	0	0	6
	High		2000-2010	258	-28	84	108	65	42	103
		S.1	2010-2020	237	-106	-2	0	0	0	16
		S. 2	2010-2020	297	-106	-2	0	0	0	23

Table 3.A2.3. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20
(cont.)

	Educational level	Scenario	Year	Young workers (new entrants)	Older workers (retirees)	Prime-age workers	New immigrants			Growth in labour force during period (%)
							Total	EU 27	Non-EU 27	
Israel	**Low**		2000-2010	46	-73	7	13			-2
		S.1	2010-2020	71	-95	5	4			-5
		S. 2	2010-2020	51	-95	5	4			-11
	Medium		2000-2010	378	-88	-54	36			32
		S.1	2010-2020	393	-176	29	10			24
		S. 2	2010-2020	334	-176	29	10			18
	High		2000-2010	419	-122	71	61			53
		S.1	2010-2020	440	-293	22	14			16
		S. 2	2010-2020	519	-293	22	14			22
Italy	**Low**		2000-2010	535	-2 801	- 684	617	176	441	-21
		S.1	2010-2020	1 259	-2 514	113	621	232	389	-6
		S. 2	2010-2020	473	-2 514	113	621	232	389	-15
	Medium		2000-2010	2 412	-1 063	251	693	369	325	24
		S.1	2010-2020	2 654	-2 297	344	607	228	379	11
		S. 2	2010-2020	2 254	-2 297	344	607	228	379	8
	High		2000-2010	1 125	- 417	543	156	62	94	49
		S.1	2010-2020	1 110	- 979	161	147	56	91	10
		S. 2	2010-2020	2 300	- 979	161	147	56	91	38
Latvia	**Low**		2000-2010	38	- 53	- 9	0.4	0.0	0.4	-16
		S.1	2010-2020	32	- 21	- 2	0.2	0.0	0.2	7
	Medium		2000-2010	140	- 122	- 50	3.4	0.2	3.1	-4
		S.1	2010-2020	102	- 156	- 14	1.6	0.1	1.5	-10
	High		2000-2010	108	- 38	35	1.9	0.0	1.9	52
		S.1	2010-2020	91	- 65	- 4	2.2	0.1	2.1	8
Lithuania	**Low**		2000-2010	7	- 97	- 18	0.0	0.0	0.0	-53
		S.1	2010-2020	31	- 15	- 4	0.0	0.0	0.0	13
	Medium		2000-2010	168	- 62	86	1.6	0.2	1.5	25
		S.1	2010-2020	143	- 238	- 37	2.5	0.2	2.2	-14
	High		2000-2010	197	- 182	- 153	2.9	0.5	2.4	-19
		S.1	2010-2020	196	- 115	- 26	4.0	0.4	3.6	10
Luxembourg	**Low**		2000-2010	5	-15	-13	7	6	1	-28
		S.1	2010-2020	8	-11	-1	9	8	2	9
		S. 2	2010-2020	1	-11	-1	9	8	2	-4
	Medium		2000-2010	18	-13	-5	11	8	2	12
		S.1	2010-2020	26	-23	-4	10	8	2	8
		S. 2	2010-2020	24	-23	-4	10	8	2	6
	High		2000-2010	14	-5	9	30	25	5	124
		S.1	2010-2020	18	-17	-3	26	21	5	31
		S. 2	2010-2020	26	-17	-3	26	21	5	42
Malta	**Low**		2000-2010	20	-23	-1	0.7	0.3	0.4	-4
		S.1	2010-2020	22	-29	-7	0.0	0.0	0.0	-12
		S. 2	2010-2020	13	-29	-7	0.0	0.0	0.0	-20
	Medium		2000-2010	11	-3	-1	0.7	0.3	0.4	26
		S.1	2010-2020	10	-6	-3	0.0	0.0	0.0	4
		S. 2	2010-2020	12	-6	-3	0.0	0.0	0.0	10
	High		2000-2010	15	0	5	0.7	0.4	0.3	181
		S.1	2010-2020	12	-5	-3	0.0	0.0	0.0	13
		S. 2	2010-2020	19	-5	-3	0.0	0.0	0.0	35

Table 3.A2.3. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20
(cont.)

	Educational level	Scenario	Year	Young workers (new entrants)	Older workers (retirees)	Prime-age workers	New immigrants			Growth in labour force during period (%)
							Total	EU 27	Non-EU 27	
Netherlands	**Low**		2000-2010	233	- 361	-91	50	14	36	-8
		S.1	2010-2020	287	- 539	-8	75	22	53	-8
		S. 2	2010-2020	85	- 539	-8	75	22	53	-17
	Medium		2000-2010	715	- 511	-210	51	18	33	2
		S.1	2010-2020	795	- 699	-14	89	26	63	5
		S. 2	2010-2020	786	- 699	-14	89	26	63	4
	High		2000-2010	748	- 216	173	58	26	31	41
		S.1	2010-2020	777	- 595	-9	85	25	60	9
		S. 2	2010-2020	993	- 595	-9	85	25	60	17
Norway	**Low**	S.1	2010-2020	83	- 79	2	43	16	27	9
		S. 2	2010-2020	103	- 79	2	43	16	27	13
	Medium	S.1	2010-2020	224	- 252	3	72	28	44	4
		S. 2	2010-2020	248	- 252	3	72	28	44	6
	High	S.1	2010-2020	278	- 169	10	54	20	34	19
		S. 2	2010-2020	245	- 169	10	54	20	34	15
Poland	**Low**		2000-2010	183	-1 126	- 315	1.1	0.1	0.8	-47
		S.1	2010-2020	155	- 479	-29	0.0	0.0	0.0	-25
	Medium		2000-2010	2 546	-2 194	-1 111	8.4	2.2	6.2	-7
		S.1	2010-2020	2 192	-3 050	-271	0.0	0.0	0.0	-10
	High		2000-2010	2 204	- 391	613	7.6	3.3	4.3	118
		S.1	2010-2020	1 842	- 827	-47	0.0	0.0	0.0	21
Portugal	**Low**		2000-2010	384	- 811	-48	92	10	82	-10
		S.1	2010-2020	521	- 918	-53	74	12	62	-11
		S. 2	2010-2020	360	- 918	-53	74	12	62	-16
	Medium		2000-2010	347	- 47	7	81	14	67	62
		S.1	2010-2020	277	- 102	-12	63	10	53	23
		S. 2	2010-2020	350	- 102	-12	63	10	53	30
	High		2000-2010	362	- 52	63	26	7	19	81
		S.1	2010-2020	287	- 121	-13	26	4	22	20
		S. 2	2010-2020	377	- 121	-13	26	4	22	30
Romania	**Low**		2000-2010	294	-1 984	-5	0.6	0.0	0.6	-41
		S.1	2010-2020	400	- 621	-22	0.0	0.0	0.0	-12
	Medium		2000-2010	1 185	- 878	- 901	0.6	0.6	0.0	-10
		S.1	2010-2020	1 170	-1 033	- 168	0.0	0.0	0.0	-1
	High		2000-2010	684	- 237	126	0.7	0.6	0.1	59
		S.1	2010-2020	550	- 227	-17	0.0	0.0	0.0	20
Slovak Republic	**Low**		2000-2010	33	- 86	-26	0.7	0.7	0.0	-32
		S.1	2010-2020	24	- 58	3	0.1	0.0	0.1	-19
	Medium		2000-2010	390	- 318	-75	1.3	0.5	0.9	-1
		S.1	2010-2020	442	- 488	46	6.2	3.7	1.9	0
	High		2000-2010	191	- 36	63	1.9	1.4	0.5	82
		S.1	2010-2020	165	- 117	29	4.6	3.2	1.3	17
Slovenia	**Low**		2000-2010	15	- 55	-14	1.9	0.1	1.8	-26
		S.1	2010-2020	11	- 46	0	5.1	0.5	4.5	-22
		S. 2	2010-2020	2	- 46	0	5.1	0.5	4.5	-29
	Medium		2000-2010	159	- 103	-27	5.9	0.5	5.4	4
		S.1	2010-2020	133	- 143	13	13.0	1.4	11.2	3
		S. 2	2010-2020	126	- 143	13	13.0	1.4	11.2	1
	High		2000-2010	92	- 26	38	1.7	0.7	0.9	68
		S.1	2010-2020	77	- 60	6	4.3	0.5	3.7	11
		S. 2	2010-2020	94	- 60	6	4.3	0.5	3.7	17

Table 3.A2.3. Changes in the educational attainment of the labour force, by source, 2000-10 and 2010-20
(cont.)

	Educational level	Scenario	Year	Young workers (new entrants)	Older workers (retirees)	Prime-age workers	New immigrants			Growth in labour force during period (%)
							Total	EU 27	Non-EU 27	
Spain	Low		2000-2010	1 326	-2 012	- 251	1 275	251	1 025	3
		S.1	2010-2020	1 435	-2 397	- 150	357	98	258	-8
		S. 2	2010-2020	650	-2 397	- 150	357	98	258	-16
	Medium		2000-2010	1 018	- 157	190	1 070	356	714	60
		S.1	2010-2020	918	- 829	- 92	372	102	270	7
		S. 2	2010-2020	1 147	- 829	- 92	372	102	270	12
	High		2000-2010	2 175	- 340	415	644	213	430	60
		S.1	2010-2020	1 911	-1 150	- 170	190	52	137	10
		S. 2	2010-2020	2 471	-1 150	- 170	190	52	137	17
Sweden	Low		2000-2010	112	- 250	- 2	75	12	62	-1
		S.1	2010-2020	67	- 270	0	98	23	75	-13
		S. 2	2010-2020	32	- 270	0	98	23	75	-17
	Medium		2000-2010	537	- 365	36	55	15	39	14
		S.1	2010-2020	469	- 481	3	86	20	66	3
		S. 2	2010-2020	416	- 481	3	86	20	66	1
	High		2000-2010	386	- 247	71	109	40	69	25
		S.1	2010-2020	468	- 337	11	148	34	114	19
		S. 2	2010-2020	555	- 337	11	148	34	114	24
Switzerland	Low		2000-2010	52	- 173	- 3	92	47	44	-6
		S.1	2010-2020	- 3	- 133	- 12	177	106	71	4
	Medium		2000-2010	396	- 415	- 151	156	97	58	0
		S.1	2010-2020	313	- 460	- 70	279	167	112	3
	High		2000-2010	280	- 86	113	234	167	67	59
		S.1	2010-2020	256	- 282	- 56	354	216	138	20
Turkey	Low	S.1	2010-2020	4 246	-2 623	- 991	23			4
		S. 2	2010-2020	4 246	-2 623	- 991	23			4
	Medium	S.1	2010-2020	2 270	- 346	- 242	14			31
		S. 2	2010-2020	2 270	- 346	- 242	14			31
	High	S.1	2010-2020	1 897	- 349	- 230	22			32
		S. 2	2010-2020	1 897	- 349	- 230	22			32
United Kingdom	Low		2000-2010	171	-1 816	- 881	521	222	299	-26
		S.1	2010-2020	693	-1 451	- 8	354	141	213	-7
		S. 2	2010-2020	- 12	-1 451	- 8	354	141	213	-19
	Medium		2000-2010	3 717	-3 220	-2 256	1 816	859	957	-1
		S.1	2010-2020	2 105	-2 693	- 17	1 217	485	731	4
		S. 2	2010-2020	1 716	-2 693	- 17	1 217	485	731	2
	High		2000-2010	3 385	-1 032	1 524	837	250	587	64
		S.1	2010-2020	2 724	-2 031	- 6	783	313	470	13
		S. 2	2010-2020	3 817	-2 031	- 6	783	313	470	23
United States	Low		2000-2010	1 027	-3 442	-2 003	2 495			-16
		S.1	2010-2020	2 501	-2 580	- 185	2 263			13
		S. 2	2010-2020	1 064	-2 580	- 185	2 263			4
	Medium		2000-2010	14 153	-9 551	- 983	3 142			11
		S.1	2010-2020	15 153	-15 071	- 823	2 820			3
		S. 2	2010-2020	12 734	-15 071	- 823	2 820			0
	High		2000-2010	13 276	-5 345	2 164	2 681			28
		S.1	2010-2020	14 691	-13 085	- 667	2 116			5
		S. 2	2010-2020	18 547	-13 085	- 667	2 116			12

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: European countries: Labour Force Surveys (Eurostat), 2000 and 2010; United States: 2000 Census and American Community Survey 2010; Canada: Survey of Labour and Income Dynamics, 1997-99 and 2007-09. Israel: Labour Force Survey, 2000 and 2010. Australia: Survey of Education and Work, 2001 and 2011. Projections: European countries: Eurostat EUROPOP2010 Population Projections. Other countries: World Population Prospects – 2010 Revision; all countries: ILO Estimates and Projections of the Economically Active Population 1990-2020.

Notes

1. For some countries it was not possible to estimate the share of individuals in each educational attainment in 2010 as a function of the share in 2000, in particular if data was not available in 2000.

2. Medium-variant migration assumptions consider future migration flows "on the basis of past international migration estimates and the consideration of the policy stance of each country with regard to the future migration flows" (United Nations, 2011). Zero migration assumption considers that international migration is zero from 2010 onwards.

Chapter 4

The demography of occupational change and skill use among immigrants and the native-born

Georges Lemaître
OCDE

Over the past decade, high-skilled occupations have generally grown strongly, low-skilled occupations somewhat less so, while medium-skilled occupations have declined or stagnated.

In rapidly growing occupations, there was a large surplus of new entrants over retirees in new jobs, for which there were many domestic candidates. But many new immigrants were also hired into these jobs, indicating that domestic sources were not sufficient to satisfy all of the needs. At the same time, new immigrants replaced only a fraction of retiring workers in declining occupations. This suggests that observed and future labour and skill shortages are not a simple function of demographic imbalances in the labour force, but depend significantly on the changing nature of demand for particular skills and the extent to which these can be filled from existing sources of supply.

For some immigrants, low levels of education constrained their occupational choices to low-skilled jobs and for others, the education and work experience earned abroad made them sometimes ill-prepared to compete with the skills of recently graduated young workers and of prime-age workers already having made their way in the labour market. EU migrants more often enter higher skilled occupations than non-EU migrants, but the high-skilled share of entries varies across countries. Finally occupational change over the 2000-10 decade shows a tendency towards a feminisation of high-skilled jobs and a greater presence of women in growing than in declining occupations. There were also proportionally more men in strongly declining occupations. The same pattern was observed for immigrants, whether from EU countries or not.

4.1. Introduction

Over the next decade and beyond, most OECD countries will be seeing significant demographic changes in the working-age population and labour force, as more and more baby-boomers retire and are replaced by smaller younger cohorts. The consequences of this are often phrased in terms of labour and skill shortages in the labour market. They strongly emphasise with the need to train and retrain the unemployed and underemployed, mobilise the inactive, make better use of the skills of those employed and, potentially, increase the inflows of international labour migrants. The demographic change underway is occurring in the context of a labour market which is continuously changing, as resources are transferred from less to more productive sectors and firms, jobs are offshored and new labour needs arise. Some occupations are growing strongly, others are declining.

What is the role of new entrants, prime-age workers and especially immigrants in occupational change? How will labour markets and enterprises adapt to the changing demographic landscape?

In order to provide some contextual data for the changes to come, this chapter first examines the demography of occupational change for the recent past, in particular the 2000-10 decade. Persons aged 55-64 in the year 2010, almost 40% of whom were already retired and who represented almost half of retirees over the 2000-10 decade, constitute the first cohort of baby-boomers born in the ten years after the Second World War.[1] Although the ageing of the workforce is only just beginning, the analysis of the dynamics of occupational change from a demographic perspective may be helpful in understanding the nature of the changes to come.

The analysis proceeds by decomposing occupational change according to the contribution to change of new entrants, prime-age workers, retiring workers and in particular, immigrants. The objective is to get a clearer picture of the demographic imbalance question that is central to discussions of ageing, to see how it is playing out in practice and where immigrants fit into the picture. As will be seen, the picture is not quite as simple as sometimes portrayed.

The first part of this chapter outlines the general methodological approach that will be followed for the analyses in the rest of the chapter. This is followed by a brief section which considers the links between immigrants in the labour market and labour demand. The following section decomposes the change in occupational distribution of employment over the period from 2000 to 2010 by demographic group. Section 4.4 looks at occupational changes and intra-EU migration while Section 4.6 explores the gender dimension. The final section concludes.

4.2. Main findings

- The educational attainment of new entrants into the labour force was much higher than that of retiring workers over the period 2000-10. New immigrants had educational levels that were between those of new entrants and retirees, with proportionally more highly educated workers among new immigrants than retirees, but more low-educated workers than among new entrants.
- Over the period 2000-10, not only were new entrants to the labour force more educated, there were more of them. There were close to three highly educated new entrants for

every retiring one in both Europe and the United States, and the reverse situation held for the low-educated.

- Immigrants represented 47% and 70% of the increase in the labour force in the United States and Europe, respectively, over the decade, but 21% and 14% respectively of the increase in the highly educated labour force. They are thus playing a more significant role in maintaining the size of the labour force than in its up-skilling in most countries.
- The composition of occupational change over the decade mirrored that observed for the educational attainment of the labour force. Young new entrants into strongly growing occupations (most of which were highly skilled) far outnumbered retirees over the past decade. Likewise, retirees from strongly declining occupations greatly outnumbered new entrants. Indeed, over 40% of net occupational change took place through the entry and exit of young and older workers.
- New immigrants represented 15% of entries into strongly growing occupations in Europe over the decade and 22% in the United States. They are thus playing a significant role in the most dynamic parts of the economy, even under conditions when most migration has not been demand-driven.
- At the same time immigrants represented 24% and 28%, respectively, of entries into the most strongly declining occupations in Europe and the United States.
- Almost half of low-skilled jobs on average are taken up by immigrants, with considerable variation across countries. In some countries, the immigrant share is very high, which risks introducing labour market segmentation, as low-skilled jobs become the exclusive domain of immigrants.
- In countries where labour migration has been more significant, the contribution of migrants to the up-skilling of the workforce and to growing occupations has been more significant.
- A demographic imbalance model of labour force change and occupational change seems inappropriate in the face of the large differences in educational attainment between entry and exit cohorts and in entry and exit from growing and declining occupations. The potential need for immigrants in the context of population ageing thus cannot be assessed on the basis of demographic imbalances alone, but must take into account changes in the nature of employment, which appear to be more dynamic than changes in the age composition of the population and labour force.
- The role which EU vs non-EU migrants play in occupational change appears to vary according to the labour market in destination countries. Only in Ireland and the United Kingdom do EU migrants on average take on lesser skilled jobs more than non-EU migrants. This seems clearly a consequence of the concentration of enlargement migration towards these two countries.
- Southern Europe sees relatively few new migrants entering high-skilled jobs, whether from Europe or elsewhere, the new accession countries relatively many but few in number. The mainstream pattern is of proportionally fewer non-EU migrants entering high-skilled jobs than resident new entrants with EU migrants somewhere in between. Whether there is convergence towards job-uptake patterns of new entrants in the future will depend on the nature of migration movements.
- There was a tendency over 2000-10 towards more young women than young men entering growing and high-skilled jobs and more young men in the strongest declining

occupations. The situation is the same for immigrants, whether EU or not, which suggests a fundamental change in the labour market, likely due to differences in educational outcomes. Gender differences in occupational skills are quite large and may be an element for policy to consider with regard to ageing.

4.3. The demography of occupational change

General methodological approach

The analyses presented in this chapter examine change (in the occupational distribution, in the levels of skills) through a *demographic accounting framework*. Succinctly, the *net* change over a period for a particular characteristic is decomposed into that due to young workers, new immigrants, prime-age workers and older workers, where the age-related components of change are estimated by comparing the situation of so-called "pseudo age cohorts" in 2000 and 2010, respectively (see Annex 4.A1 for the details). The pseudo cohort approach implicitly includes the effects of emigration and mortality, which cannot be observed directly.[2]

In addition, since characteristics are observed at two points in time, abstraction is made of multiple changes that may have occurred over the period. A worker may change jobs if not occupation several times in the intervening period, but the only jobs and occupations that are observed are those at the beginning and end of the time period, which are the ones which enter into the net change calculations. Note also that with the pseudo-cohort approach, much of the change observed for young workers and older workers will be due to workforce entry and retirement, respectively. For the age groups considered, these largely predominate over occupational change in the net change calculations. This means in practice that the contributions to change in the labour force and in occupations due to young and older workers are always positive, respectively negative for the labour force and for every occupation. For example, on average across countries, the net changes in employment for young workers and older workers amount to approximately 87% and 80% of employment for an entry cohort (aged 25-34 in the year 2010) and an exit cohort (aged 45-54 in the year 2000), respectively. For the prime-age group, on the other hand, the net change measure may hide a considerable amount of movement which is not visible, because it is offsetting, as new hires replace persons who quit or are laid off. The data used for the analyses are taken from the European Union labour force survey for European countries, from the American Community Survey for the United States and from the Survey of Labour Income and Dynamics (SLID) for Canada.

The role of immigrants in the labour market

Before delving into the empirical data, it is useful to consider first the relation between labour demand and the presence of new immigrants in the labour market. This question is of particular interest because of the fact that most arriving immigrants have not ostensibly been recruited from abroad by employers for specific jobs for which there has been an identified or tested labour need, but have arrived for family or humanitarian reasons or through unauthorised channels. Many have entered the labour market, either upon arrival or later, and been hired into jobs, of which the skill level may or may not always have been commensurate with their formal qualifications. They are not unique in this respect; some young persons entering the labour market are in the same situation. But some immigrants arrive with little knowledge of the destination-country language and

with qualifications and experience acquired abroad in a different economic context that may not easily be transferable to the labour markets and workplaces of destination countries.

Still, many immigrants, especially those arriving under free-circulation regimes or through unauthorised means, may nonetheless arrive in response to knowledge about job opportunities transmitted through the media or by migrant networks, in particular friends and relatives in destination countries. There may even be specific jobs awaiting them upon arrival.

The same applies to the non-labour migrants who enter the labour market every year but were admitted under another type of residence permit. A study covering immigrant entries into the labour force over the 2004-06 period in France, for example, showed that 90% of the entries consisted of non-labour migrants, at a time when direct recruitment accounted for less than 5-10% of total immigrant inflows in France (Léger, 2008). More than three-quarters of non-labour migrant entries into the labour force occurred during the year following arrival.

The statistics and results presented in this chapter will reflect the impact of a mix of migrants in the labour market, with persons who were not specifically recruited by employers being in the majority in many countries. If the incidence of labour migration increases in the near-to-medium term, one can expect some shift in the impact of migration in general, as more workers arrive for specific jobs and relatively fewer as general entrants into a labour market, searching for work along with other domestic suppliers. In this respect, the experience of labour migration countries may be an instructive guide to what the future holds for countries expecting to increase their labour migration in the following decades.

The nature of occupational change – previous results

Given the substantial increase in the educational levels of young workers entering the labour force in OECD countries over the past decade, one might expect analogous changes to occur in the distribution of occupations and in the skill levels of jobs in the labour market. However, with increasing educational levels, one could also be witnessing an increasing proportion of entrants overqualified for available jobs. Such a result would suggest that the increase in attainment levels would be more supply- than demand-induced. As will be seen, the skill level of jobs is increasing as well.

The trends in the composition of employment have shown a continuous process of skill upgrading between 1950 and 2010 (Handel, 2010). The occupational distribution of employment has changed: shifting first from agricultural to production jobs, and later to professional, associate professionals and technical jobs.

Thus, there is little doubt that there has been an increase in job skill demands in OECD countries in the last decades. The increase in the demand for high-skilled workers has been interpreted for a long time as the result mostly of technological change (see Autor and Katz, 1999 for a review of the literature on skill-biased technological change, SBTC).

However, parallel to this increase in employment in higher skilled occupations, there has been as well an increase in lower-skilled occupations and a decrease in middle-skilled occupations. This phenomenon of *job polarisation* has been observed in several OECD countries. Acemoglu and Autor (2010) describe the simultaneous increase in the

share of employment in high-skill, high-wage occupations and low-skill, low-wage occupations in the United States and in the European Union. The authors argue that to describe the changes in the employment distribution a complex framework is necessary with "interactions among worker skills, job tasks, evolving technologies and shifting trading opportunities".

Several factors might explain *job polarisation,* Autor, Levy and Murnane (2003) suggested a *routinisation hypothesis*: middle-skilled and manual jobs are substituted by technological improvements and the relative demand for jobs with non-routine tasks increases. Non-routine tasks include not only abstract tasks which require high educational levels, but also non-routine manual tasks, as in many service occupations such as elderly care, security services, etc.

Other factors such as the increase in offshoring and outsourcing, in themselves partly facilitated by technological change, and changes in labour market institutions could be partly responsible for the reduction in the number of jobs in certain occupations. Goos, Manning and Salomons (2009, 2010) suggest that the *routinisation* of tasks is the main factor explaining the observed job polarisation of employment, abetted by offshoring. Labour market institutions affecting relative wages seem to play a smaller role in the process.

Michaels, Natraj and van Reenen (2010) have presented evidence that the observed job polarisation is based on ICT technological change that increases the relative demand for high-educated workers and decreases the relative demand for middle-educated workers.

4.4. The extent of occupational change over the decade 2000-10

How much occupational change is there? The amount of change observed will depend on how fine the viewing lens is; the greater the magnifying power, the more movement one will observe. The occupation data used for the analyses to follow generally apply the International Standard Classification of Occupations (ILO, 1988), which classifies occupations up to four-digit level (390 occupations). However, for the analyses carried out here, the two-digit classification (27 groups)[3] has been used. It represents an appropriate compromise between fine resolution, on the one hand, and sampling variability, on the other, given that change is being measured at the level of the individual occupation.

The time period used for the analysis (2000-10) includes the recent economic crisis and the sluggish recovery of 2009-10. In practice, this means that the changes observed may in part be cyclical in character, in that some declines may represent the rise in unemployment among persons in certain occupational groups.

Table 4.1 lists the occupations in European countries and the United States and the growth rates observed over the 2000-10 period, as well as the share of employment by occupation for all workers and for immigrants. For European countries, among the thirteen occupations with growth rates over 15% over the period, only three do not fall into a higher skill category, namely agricultural, fishery and related labourers, personal and protective services workers and sales and services elementary occupations. Occupations which declined by at least 15% concern workers in the trades and in manufacturing-related jobs or skilled agricultural and fishery workers.

Table 4.1. Growing and declining occupations, 2000-10

Percentages

European countries

ISCO88 code		Average growth 2000-10	Average share of employment 2010 (all workers)	Average share of employment 2010 (immigrants)
24	Other professionals	52	5.8	5.4
21	Physical, mathematical and engineering science professionals	50	3.9	4.1
32	Life science and health associate professionals	43	3.0	2.4
33	Teaching associate professionals	39	1.5	1.0
11	Legislators and senior officials	28	0.2	0.2
34	Other associate professionals	36	8.9	6.0
12	Corporate managers	29	4.2	3.5
51	Personal and protective services workers	25	9.9	12.1
31	Physical and engineering science associate professionals	22	4.0	2.8
22	Life science and health professionals	22	2.2	2.4
92	Agricultural, fishery and related labourers	22	0.5	1.0
23	Teaching professionals	21	4.6	3.0
91	Sales and services elementary occupations	21	6.4	13.6
42	Customer services clerks	12	2.1	1.7
52	Models, salespersons and demonstrators	10	5.5	5.2
93	Labourers in mining, construction, manufacturing and transport	6	2.5	4.3
83	Drivers and mobile-plant operators	5	4.0	3.8
71	Extraction and building trades workers	-1	5.4	7.0
13	General managers	-3	3.3	3.1
41	Office clerks	-6	8.6	5.5
81	Stationary-plant and related operators	-11	0.9	0.9
72	Metal, machinery and related trades workers	-12	4.7	3.9
61	Market-oriented skilled agricultural and fishery workers	-16	3.3	1.3
82	Machine operators and assemblers	-19	2.6	3.5
74	Other craft and related trades workers	-29	1.7	1.8
73	Precision, handicraft, printing and related trades workers	-31	0.6	0.5
	All occupations	9	100.0	100.0

Note: ISCO88: International Standard Classification of Occupations, 1988 version.

United States

SOC code		Average growth 2000-10	Average share of employment 2010 (all workers)	Average share of employment 2010 (immigrants)
15	Personal care and service occupations	37	3.6	4.4
11	Healthcare support occupations	35	2.5	2.8
14	Building and grounds cleaning and maintenance occupations	31	4.0	8.3
10	Healthcare practitioners and technical occupations	27	5.5	5.0
13	Food preparation and serving related occupations	26	5.7	8.2
6	Community and social service occupations	21	1.7	1.0
12	Protective service occupations	20	2.3	1.1
8	Education, training, and library occupations	18	6.3	3.9
2	Business and financial operations occupations	16	4.7	3.6
1	Management occupations	12	9.7	7.4
3	Computer and mathematical occupations	8	2.5	3.4
18	Farming, fishing, and forestry occupations	8	0.7	2.1
16	Sales and related occupations	6	11.2	9.0
22	Transportation and material moving occupations	4	6.1	6.8
9	Arts, design, entertainment, sports, and media occupations	4	1.9	1.5
5	Life, physical, and social science occupations	1	0.9	1.2
7	Legal occupations	0	1.0	0.5
19	Construction and extraction occupations	-2	5.1	7.7
4	Architecture and engineering occupations	-6	1.8	2.0
17	Office and administrative support occupations	-6	13.6	9.1
20	Installation, maintenance, and repair occupations	-17	3.2	2.6
21	Production occupations	-25	5.9	8.4
	All occupations	6	100.0	100.0

Note: SOC: Standard Occupational Classification.

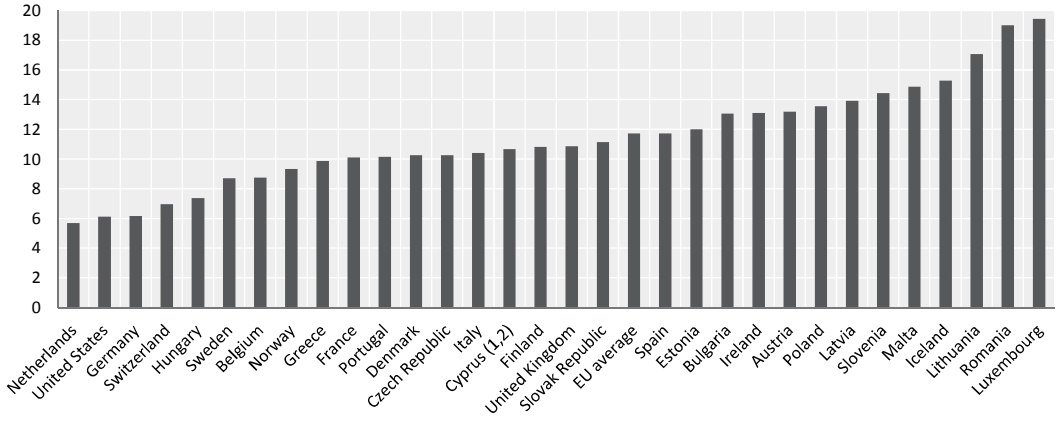
Source: European countries: Labour Force Surveys, Census 2000 and American Community Survey for the United States and Survey of Labour and Income Dynamics for Canada. See Table 4.A2.1 in the annex.

In the United States, the picture appears less clear-cut. Although there is no skill or credential level associated with occupational groups in the US occupational classification, one can more or less distinguish occupational groups which on the whole seem highly skilled from those which are lesser skilled. They are those numbered 1 to 10 in Table 4.1, for which the percent of workers with tertiary qualifications varies from about 55% to 85%. This is comparable to the groups consisting of professionals, senior officials and managers in European countries (ISCO major groups 11 to 26), for which the percent of workers with tertiary attainment varies between 55 and 90%.[4]

Among occupational groups with growth rates over 15% in the United States, five out of the nine appear lesser skilled, with healthcare practitioners and technical occupations and education, training and library occupations being the two which appear to group more highly skilled occupations. Among the strongly declining occupational groups are installation, maintenance and repair occupations (-17%) and production occupations (- 5%).

Over the decade from 2000 to 2010, the occupational distribution in OECD countries changed by approximately 10 percentage points on average (Figure 4.1), that is, it would require a reallocation of 10% of employed persons from the occupational distribution observed in 2010 in order to make it identical to that observed in the year 2000. As is evident from the figure, many of the countries which have seen high levels of labour migration over the decade, such as Ireland, Italy, Luxembourg, Spain and the United Kingdom, have also seen more occupational change. But this is not the case everywhere. For example, Greece, Switzerland and the United States also saw significant labour migration, but show less occupational change.

Figure 4.1. Total change in the distribution of employment by occupation, 2000-10



Note: The statistic shown here is the index of dissimilarity between the distributions in the years 2000 and 2010, respectively. It is estimated as half the sum of the absolute values of the difference in the share of workers in each occupation in 2000 and 2010. It can be interpreted as the percentage of workers in 2010 who would have to be reallocated to other occupations to make the 2010 distribution coincide with that for 2000.

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: European countries: Labour Force Surveys, Census 2000 and American Community Survey for the United States and Survey of Labour and Income Dynamics for Canada. See Table 4.A2.1 in the annex.

Although 10% of the occupational distribution does not seem like a very large amount. By way of contrast, the net turnover in the labour force[5] for the four demographic groups over the period amounted to 25% of the 2000 labour force. A 10% change in the occupational distribution in the face of 25% turnover would indeed be significant, if all of the change were occurring through entry and exit. But some occurs also in the prime-age workforce, as workers change occupations, by applying skills and experience acquired in one occupation to another, by means of educational upgrading or through training.

A demographic decomposition of occupational change

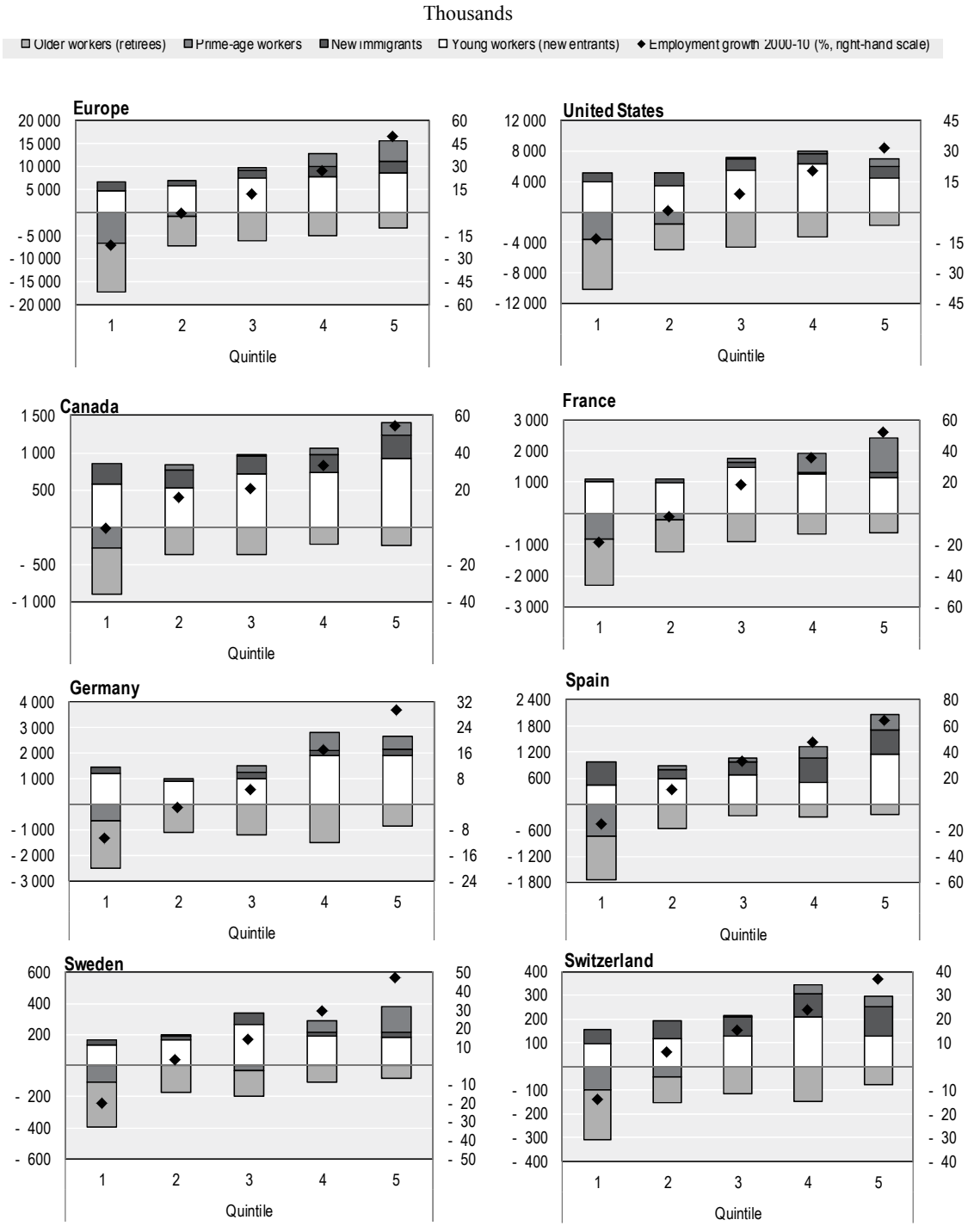
For the purpose of the analyses in this section, the occupational groups for each country have been divided into *quintiles*, where the quintile designation is based on the growth in employment in the occupation over the 2000-10 period. Each quintile thus contains approximately 20% of total 2010 employment for each country.[6] The occupational change occurring within each quintile is then decomposed into components in the usual way, namely, that attributable to young workers, to immigrants who entered over the 2000-10 period, to prime-age workers and to older workers. Because a high proportion of the change observed for young and older workers, respectively, reflects entry and retirement, the young-worker and older-worker groups will sometimes be referred to as "new entrants" and "retirees" in what follows.

The grouping into growth quintiles makes it simpler to examine more closely a number of questions of particular interest, with respect to recent immigrants, but provides information for other demographic groups as well. Of particular interest is the role of each group in the growth and decline of occupations and the special role, if any, played by immigrants in this regard.

Figure 4.2 summarises the initial results by quintile for all European countries taken as a whole, for the United States and for a selected number of other OECD countries. It gives the contribution of each demographic group to the change in employment observed in each occupational growth quintile over the 2000-10 period. The underlying data for the figures as well as similar data for all other countries for which the immigrant labour force survey samples are sufficiently large to support this kind of analysis can be found in Annex 4.A1. The results for European countries as a whole and for the United States are similar in a number of respects.

The first thing to note is that, in general, the number of older workers leaving particular occupations becomes smaller as one moves from strongly declining to strongly growing occupations. Conversely, the number of young worker entries increases as one passes from declining to growing occupations. Indeed, the balance between the entry of young workers and the exit of older workers accounts on average in Europe, the United States and Canada for from 35% to 60% of the net change in employment in each of the occupational growth quintiles (Table 4.2). In other words, a considerable amount of net occupational change occurs through generational change in the workforce, that is, through the entry of young workers and the exit of older workers. That some of this should be the case was to be expected; that the correspondence between change and entry and exit should be so strong was less so. The data suggest that jobs in declining occupations are often following the retirement of their incumbents and that jobs for which many young workers are hired are often new ones. Note, however, that the patterns for individual countries may not always be as clear-cut.

Figure 4.2. Demographic components of net occupational change by occupational growth quintile, 2000-10



Source: European countries: Labour Force Surveys, Census 2000 and American Community Survey for the United States and Survey of Labour and Income Dynamics for Canada. See Table 4.A2.1 in the annex.

Table 4.2. Occupational entry and exit and occupational growth and decline, 2000-10

Occupational growth quintile	European countries			United States			Canada		
	Growth 2000-10	Contribution of entry-exit to employment growth	Share of entry-exit in net employment change	Growth 2000-10	Contribution of entry-exit to employment growth	Share of entry-exit in net employment change	Growth 1998-2008	Contribution of entry-exit to employment growth	Share of entry-exit in net employment change
1	-22	-12	55	-14	-7	52	-1	-1	96
2	-1	-2	291	1	1	123	16	5	34
3	12	4	36	9	3	31	20	12	57
4	26	10	37	20	13	64	33	20	61
5	49	22	44	31	16	51	54	31	58

Note: Entry here refers to entries of young workers, exit to retirement of older workers. Entry and exit figures shown here are net of some occupational change occurring among young and older workers.

Source: European countries: Labour Force Surveys, Census 2000 and American Community Survey for the United States and Survey of Labour and Income Dynamics for Canada. See Table 4.A2.1 in the annex.

Accompanying the general pattern observed for young and older workers is the movement out of declining occupations and into growing occupations on the part of prime-age workers. This subsumes a number of different phenomena in addition to occupational mobility, namely mortality and emigration, persons leaving employment after resignation or layoff, and movements into employment by the unemployed or inactive, in particular women re-entering the workforce after an absence. Occupational change by this group and occupational entries by young workers are both strong predictors of the direction of occupational change in general (correlations with occupational growth of 0.80 and 0.85, respectively, across occupations).[7] The change by older workers (including retirement) is a weaker covariate (0.62) and occupational entries of immigrants weaker still (0.35).

The particular character of immigrant occupational entry (an equal distribution across quintiles in the United States and a strong presence in the lowest quintile in Europe) may well be associated with the lower average level of educational attainment of this group or with the nature of the skills which they bring with them to their new country of residence. New immigrants may lack the language proficiency of the native-born and may have qualifications and experience which are not recognised by employers or are not easily transferable to a different working environment.

Figure 4.2 also shows that there are many more net entries into occupations in the top 2 growth quintiles than there are retirements. The concept of replacement thus hardly seems pertinent for these occupations, although the surplus of entries over exits does not exclude the possibility that the occupations may nevertheless be in shortage. Shortages may be regional, in highly specific occupations or fields of study or may involve high-level skills for which the domestic supply is limited. A recourse to recruitment from abroad cannot be excluded in particular cases, but the evidence does not favour a demographic explanation for expected labour needs arising because of the retirement of large baby-boom cohorts. The changing nature of labour demand, and in particular of occupations would appear to weigh heavily in the balance.

At the same time as new jobs are being created, many jobs are disappearing (bottom quintile). In other words, only a fraction of workers retiring from these jobs is being replaced. For these the role of new immigrants may be crucial, especially if the jobs are not viewed as attractive by the domestic workforce.

In almost all countries, immigrants are less numerous among entries into the bottom two quintile occupations than they are among entries into the top two, but somewhat less so than is the case for new entrants (Table 4.3). There are some exceptions to this, however, namely the Czech Republic, Denmark, the Netherlands and Norway, where immigrants enter less often into high-growth occupations than into low-growth ones. Since the top quintiles are the growing ones, one would of course necessarily expect some groups to be overrepresented there, but that immigrants would be overrepresented was far from pre-ordained. Note in particular that it is in the countries of Southern Europe, where labour migration over the past decade has been high, as well as in Luxembourg, Switzerland and the United Kingdom that one sees more immigrants entering high-growth occupations.

Table 4.3. Entries of new immigrants into growing and declining occupations, 2010

	Share of all immigrant entries				New immigrant share of all entries		
	In growing occupations	In declining occupations	Difference	Difference for young resident workers	In growing occupations	In declining occupations	Difference
	A	B	A-B		C	D	C-D
	Percentages		Percentage points		Percentages		Percentage points
Latvia	17	45	-27	23	1	4	-3
Bulgaria	24	58	-34	10	0	0	0
Slovenia	27	46	-19	24	1	5	-4
Sweden	31	29	2	8	9	15	-7
Denmark	34	44	-10	30	10	30	-20
Netherlands	36	42	-6	13	6	10	-4
Finland	38	30	8	14	4	6	-2
France	40	37	2	7	5	10	-5
Austria	40	37	3	16	12	24	-12
United States	41	39	2	14	20	28	-8
Norway	41	50	-9	22	12	27	-15
Ireland	41	42	-1	55	29	82	-53
Germany	42	32	10	24	8	14	-6
Czech Republic	42	47	-5	18	3	7	-5
Estonia	45	47	-2	27	2	4	-2
Belgium	46	37	9	8	20	24	-4
Portugal	47	34	12	38	10	24	-14
United Kingdom	47	37	11	15	22	33	-11
Switzerland	48	35	13	16	34	40	-5
Lithuania	48	29	20	40	1	2	-1
Cyprus[1,2]	49	33	17	-1	44	45	0
Greece	52	34	18	24	17	25	-8
Malta	52	32	20	17	3	4	-1
Spain	53	34	19	25	33	45	-12
Poland	53	32	21	16	0	0	0
Slovak Republic	54	13	41	19	0	0	0
Italy	59	24	35	11	22	22	0
Hungary	60	32	27	24	3	4	-1
Luxembourg	60	30	30	20	50	57	-7
Romania	73	11	61	47	0	0	0
Average, new immigrants (above)	**45**	**36**	**9**	**21**	**13**	**20**	**-7**
Average, young resident workers (detail by country not shown)	**50**	**29**	**21**				

Note: Growing occupations are in the top two growth quintiles, declining occupations in the bottom 2 quintiles. Entries include those of new immigrant and resident young workers plus net occupational change by prime-age workers (when positive).

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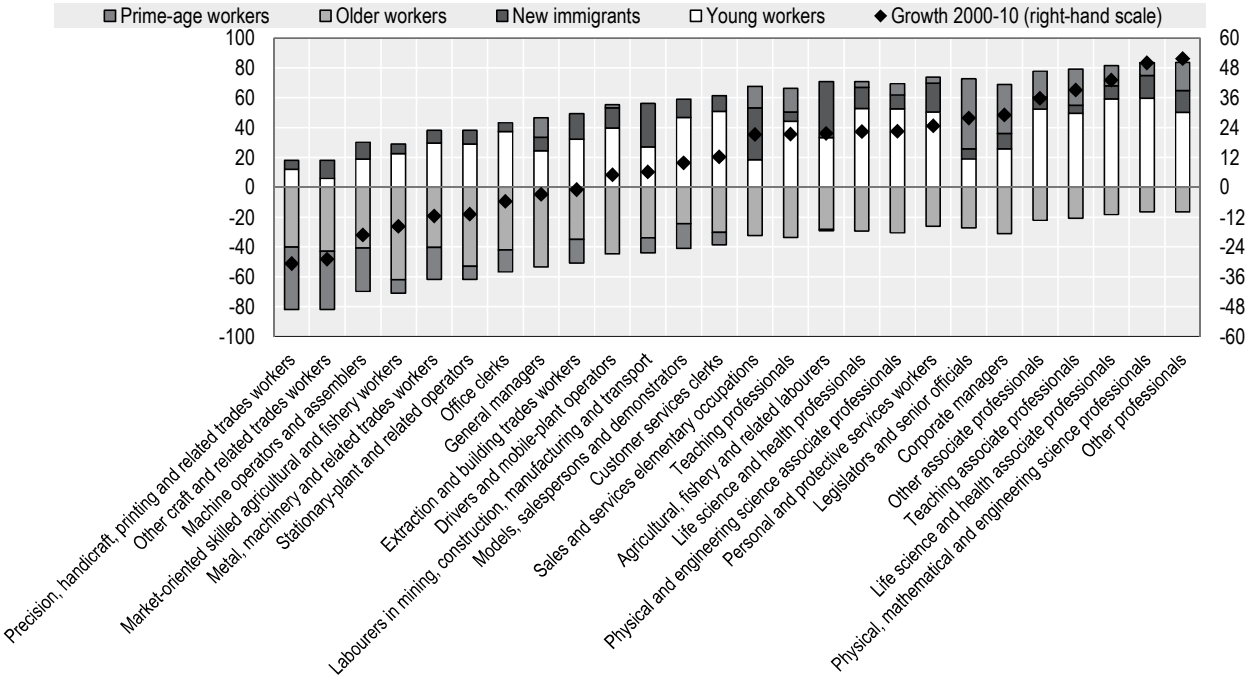
Source: European countries: Labour Force Surveys, Census 2000 and American Community Survey for the United States and Survey of Labour and Income Dynamics for Canada. See Table 4.A2.1 in the annex.

That immigrants are more often entering high-growth than low-growth occupations says little about their contribution to the evolution of these occupations. They may play a relatively minor role compared with the more numerous domestic sources of labour supply, which include former migrants as well as young workers and prime-age workers. Indeed in some countries (France Germany, the Netherlands, Sweden), the role of immigrants was not especially important over the past decade, accounting for less than 10% of the movements into high-growth occupations. Again, it is in the same countries noted above (Southern Europe, Luxembourg, Switzerland, the United Kingdom) that the contribution of immigrants to high-growth occupations becomes more significant, ranging from 20% to as high as 50% of the change observed (in Luxembourg).

Changes in employment by occupation 2000-10

The picture for individual occupations is shown in Figure 4.3a on average for European countries and in Figure 4.3b for the United States. The movement out of declining occupations (largely through retirement) by older workers, the movement into growing occupations by prime-age and young workers and entries by immigrants in both growing and declining occupations are evident.

Figure 4.3a. Contribution of different demographic groups to occupational growth, average over European countries, 2000-10

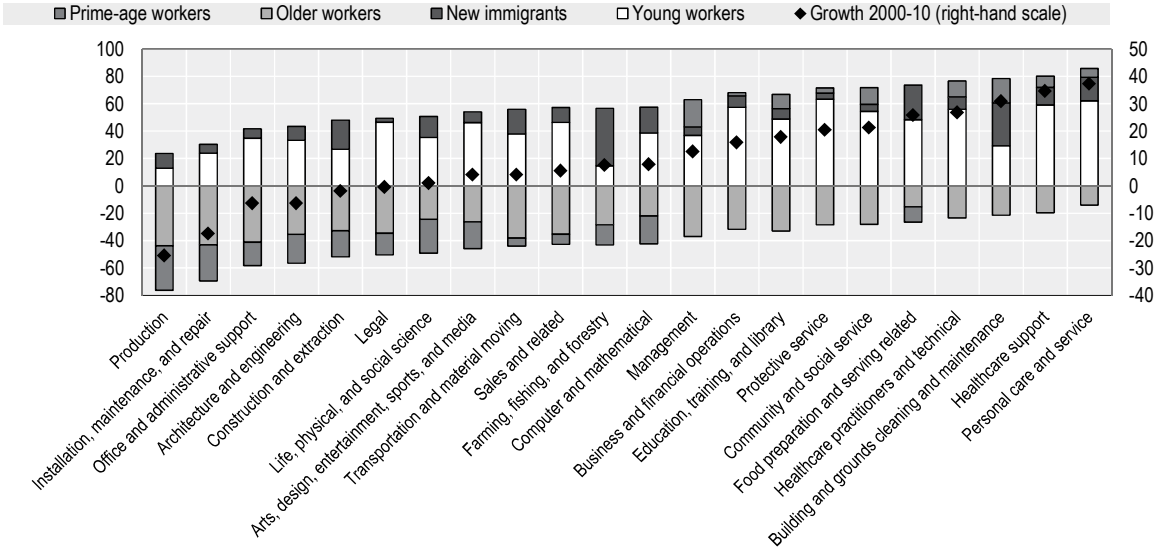


Source: Labour Force Surveys (Eurostat).

In both figures, the strong immigrant presence in particular lower-skilled occupations (sales and service elementary occupations, agricultural fishery and related labourers in European countries; farming, fishing and forestry occupations and building and ground cleaning and maintenance in the United States) are also evident. For neither the European countries nor the United States does immigrant entry into specific occupations appear to

be related closely to occupational growth or decline or to a replacement deficit due to the retirement of older workers, at least not at the occupational level examined here. The strong growth of highly skilled occupations across the board evident in European countries appears to be less present in the United States, where architecture and engineering occupations, for example, have actually declined and where occupations in the life, physical and social sciences show scarcely any increase over the 2000-10 period.

Figure 4.3b. Contribution of various demographic groups to occupational growth, United States, 2000-10



Source: Census 2000 and American Community Survey.

In summary then, the past decade has seen considerable occupational change, in particular movement away from trades and manufacturing professions and towards professional and other skilled occupations, especially in Europe. In the United States, the movement seems to be less polarised, with some high-skilled occupations declining or not growing. A significant part of net occupational change appears to occur towards the beginning and end of working life as older workers leave or retire from declining occupations and younger workers enter growing ones. Entries of young workers into growing occupations far outnumber the retirement of older workers from these. For declining occupations, the situation is the reverse.

Immigrants have been significant players in the growth and decline of occupations but have not been as present in entries into high-growth occupations as natives, and in particular young workers. Although more numerous among entries into growing than declining occupations, they are proportionally more present in declining or slower-growing occupations.

These results raise a number of questions. Firstly, if there is (and perhaps continues to be) such a large surplus of new entrants over retirees in growing occupations, will skill shortages still develop to the extent expected? How significant will recruitment from abroad actually have to be? The existence of a surplus is no guarantee that shortages will not emerge, if the hiring of immigrants into growing occupations over the past decade is any indication, but to project or identify shortages on the basis of analyses of demographic imbalances alone seems problematical. The evolution of the economy and

of occupations would appear to be far more important factors for projecting labour needs than demographic trends per se.

Secondly, new immigrants account for a significant proportion of entries into declining occupations. Are they filling a real need here, for example, by taking up occupations abandoned by domestic workers and which would otherwise go begging, or are they providing cheap labour to firms that are on the decline? The answers to these questions may affect the extent to which migration channels for lesser-skilled jobs need to be opened up over the next decade.

The evolution of occupational and job skill levels

It was noted above that growing occupations in European countries on average tend to be the highly skilled ones, that is, professional, technicians and associate professionals, with some growth as well in low-skilled occupations. Although the picture for individual occupations is mixed in the United States, the aggregate result is fairly similar. Table 4.4 summarises the growth rates by occupational skill level and country for the period 2000 to 2010. The professionals group increased by 22% on average over the period, associate professionals by 28%. Occupations at mid-range skill levels, including clerks, office workers, skilled trades and machinery operators, actually declined by 2% on average, while elementary occupations grew by 9%. In the United States, the skilled group progressed by 13%, middle-skill occupations declined by 2% and low-skilled ones increased by 26%.[8] The trend is thus towards an increase at the extremes of the skill distribution and a loss of jobs in the middle, a pattern consistent with that described in Acemoglu and Autor (2011).

The situation is not entirely uniform across countries, however. The mid-range occupations progressed in a number of countries, in particular Spain and Norway, while elementary occupations declined in Belgium, the Czech Republic, Denmark, Luxembourg, Norway and Portugal.

The increase in elementary occupations is especially large in some countries, ranging from 22% in Sweden to 39% in Austria and the United Kingdom. These occupations are not especially numerous, however; their contribution to the total employment growth observed over the period of 8% was approximately 1% on average across countries.

This provides the general picture for the economy as a whole. How have the skill levels of jobs held by immigrants evolved over the past decade? We have seen that immigrants are relatively more present among movements into growing occupations and that the latter *on average* tend to be highly skilled. One might be tempted to conclude that new immigrants are finding jobs in highly skilled occupations. Although some are, the distribution of job skill levels among recent immigrants is significantly below that of young workers entering or changing jobs (Figure 4.4). On average, there is a 20-point difference between recent immigrants and young workers in the percentage taking on highly skilled jobs (managers, professionals and associated professionals). This apparent contradiction is due to the fact that growing occupations also include agricultural, fishery and related labourers and sales and services elementary occupations and that many recent immigrants have found jobs in these occupations.

Table 4.4. Employment growth 2000-10, by occupational skill level

European countries	Employment growth 2000-2010					Contributions to total employment growth				
	Professionals, senior officials and managers	Technicians and associate professionals	Clerks, service workers,skilled trades, machinery operators	Elementary occupations	All workers	Professionals, senior officials and managers	Technicians and associate professionals	Clerks, service workers,skilled trades, machinery operators	Elementary occupations	All workers
	(A)	(B)	(C)	(D)	(A+B+C+D)	(E)	(F)	(G)	(H)	(E+F+G+H)
Romania	31	-4	-28	56	-16	3	0	-22	4	-16
Lithuania	29	61	-20	-31	-7	4	5	-13	-4	-7
Portugal	16	24	-5	-10	0	2	2	-3	-1	0
Latvia	28	0	-11	-4	0	6	0	-6	-1	0
Hungary	18	-2	-7	11	0	3	0	-4	1	0
Estonia	17	0	-6	-12	0	4	0	-3	-1	0
Denmark	8	17	-6	-16	0	2	4	-3	-2	0
Finland	8	8	-2	9	3	2	1	-1	1	3
Italy	5	33	-8	32	4	1	6	-5	3	4
Czech Republic	-3	39	1	-36	5	0	7	1	-3	5
Bulgaria	17	-15	5	21	6	3	-2	3	2	6
United Kingdom	3	56	-6	39	6	1	5	-3	3	6
Greece	25	41	-7	44	7	6	3	-4	3	7
Netherlands	12	8	2	6	7	4	1	1	1	7
Germany	21	14	-2	9	7	4	3	-1	1	7
Slovenia	51	25	-14	66	8	9	3	-9	4	8
Switzerland	27	16	0	15	9	4	4	0	1	9
Poland	52	1	0	2	9	9	0	0	0	9
Belgium	28	10	1	-6	9	8	1	1	-1	9
Sweden	31	17	-2	22	10	7	3	-1	1	10
Norway	18	22	5	-16	10	3	5	3	-1	10
Ireland	22	42	2	-4	10	7	2	1	0	10
Slovak Republic	15	28	7	-5	11	3	5	4	-1	11
Austria	11	61	-4	39	11	2	9	-3	3	11
France	42	21	-5	35	11	8	4	-3	3	11
Malta	31	22	6	24	15	6	3	3	3	15
Spain	38	58	7	17	19	7	6	4	2	19
Luxembourg	83	54	-11	-9	22	19	10	-5	-1	22
Cyprus[1,2]	65	52	11	67	32	10	6	6	9	32
Average	**26**	**25**	**-3**	**13**	**7**	**5**	**3**	**-2**	**1**	**7**
Average (excluding Cyprus[1,2] and Luxembourg)	**22**	**22**	**-4**	**11**	**6**	**4**	**3**	**-2**	**1**	**6**

	Employment growth 2000-2010				Contributions to total employment growth			
	High-skilled	Medium-skilled	Lower-skilled	All workers	High-skilled	Medium-skilled	Lower-skilled	All workers
United States	**13**	**-2**	**26**	**6**	**5**	**-1**	**2**	**6**

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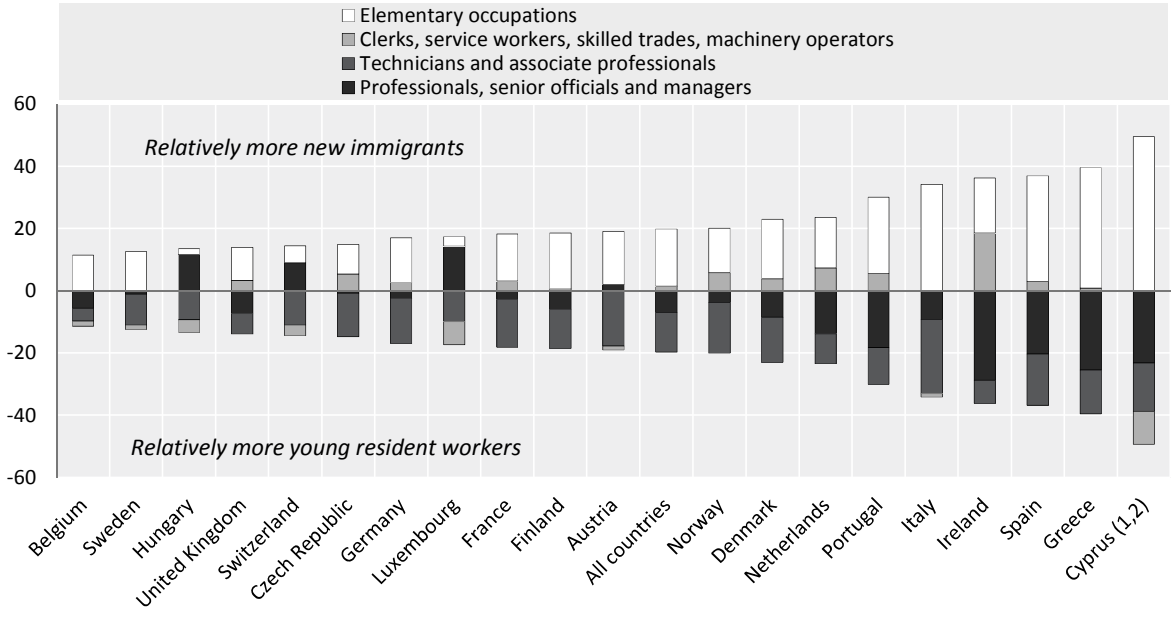
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Source: European countries: Labour Force Surveys, Census 2000 and American Community Survey for the United States. See Table 4.A2.1 in the annex.

Only in Hungary, Luxembourg and Switzerland does one find relatively more recent immigrants in highly skilled jobs (professionals, senior officials and managers) than young workers entering such jobs. In all other countries, there are relatively fewer recent immigrants taking on skilled jobs than young workers, ranging from 10 percentage points less in Belgium and Sweden to over 35-40 percentage points less in Southern Europe and Ireland. Likewise, the greater specialisation of immigrant in low-skilled jobs is evident in almost all countries, the immigrant percentage in entries into low-skilled jobs exceeding that of the young workers by 18 percentage points on average.

Figure 4.4. Differences in the distribution of occupational skills of workers entering or changing jobs by skill level, new immigrants compared to young resident workers, 2000-10

Percentage points



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Source: Labour Force Surveys. See Table 4.A2.1 in the annex.

Finally, Figure 4.5 summarises the situation comprehensively with regard to entries and exits into jobs by occupational skill level and demographic group. In most countries, new immigrants are entering elementary occupations proportionally more than young workers and their presence in these occupations is often substantial. There are only a few countries where this is less the case, namely Luxembourg, Switzerland, the Czech Republic and Hungary. In the countries of Southern Europe, some 30% or more of arriving immigrants over the period 2000-10 period entered elementary occupations. These countries are also those which have shown the greatest increase in the share of high-skilled jobs among young workers compared with older workers over the decade. Indeed, there is a moderately strong positive correlation association (0.68) between the extent of job upskilling among young workers entering the labour force over the period 2000-10 and the incidence of new immigrants taking on low-skilled jobs.[9]

Figure 4.5a. Skill level composition of occupational entries or exits, by demographic group, 2000-10

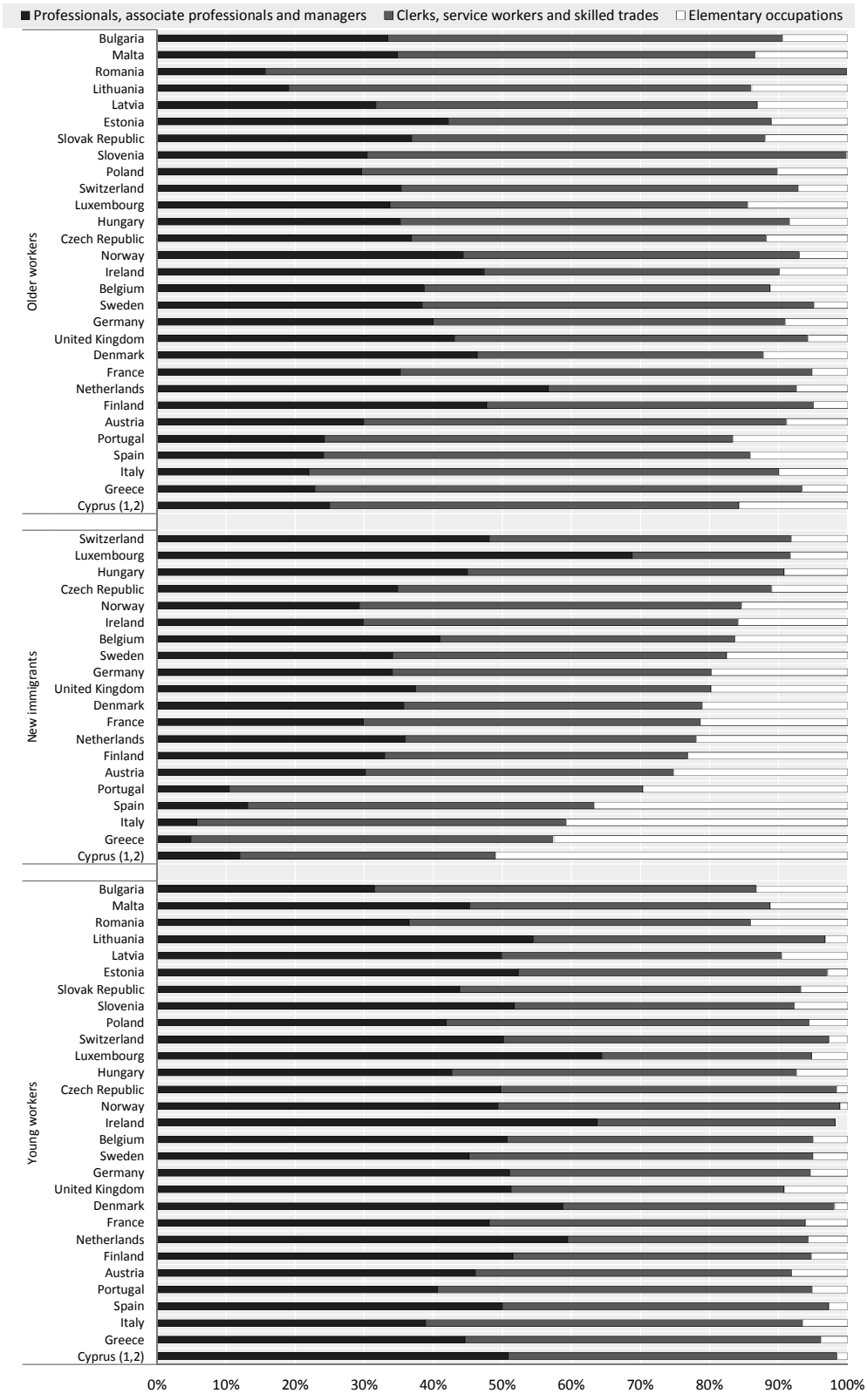


Figure 4.5b. Demographic composition of occupational entries or exits, by skill level, 2000-10



Note: In most countries, the number of prime-age workers in mid-skill jobs actually declined over the 2000-10 period, which is why they do not appear in the central panel and in for some countries in the right-hand panel.

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Source: Labour Force Surveys. See Table 4.A2.1 in the annex.

Low-skilled jobs are becoming more and more "reserved" for immigrants, as is evident from Figure 4.5b, which shows that on average across countries, half of low-skilled jobs are being filled by immigrants. The proportion, however, ranges from less than 15% in France and Hungary to over 90% in Spain and Ireland.

4.5. Occupational change and intra- and extra-European migration

The preceding analysis has addressed the question of occupational change over the period 2000-10, with a view to presenting both its magnitude across OECD countries (for which data are available) and the contribution to change of various demographic groups. Among these was that of new immigrants, without further differentiation of this group. In the European Union, however, potential migrants consist of two distinct groups, one of which has freedom of movement within the borders of the Union, while the other is subject to restrictions on entry and stay imposed by the member states. The question of how free movement could contribute to satisfying labour needs in an ageing context was examined in a recent joint EC/OECD conference on "Growing Free Labour Mobility Areas and Trends in International Migration" (OECD, 2012a), but the role which the two distinct kinds of migration could play in the evolution of occupational change was not directly considered. This is the subject of the following section. The emphasis here will be essentially on the distinction between migration of EU nationals and of so-called "third-country" nationals, the reference group for both being that of young new entrants into the labour markets of European countries. The objective is, as it was in the preceding analysis, to attempt to draw lessons from the experience of the previous decade on the nature of occupational change and on the role which migration could play in this regard in the future.

What governments do and do not regulate

One element in the comparison to follow is the extent to which freedom of movement as opposed to constrained movement affects the nature of the jobs which immigrants take up. The last decade saw the expansion of the European Union to include initially 10 and ultimately 12 new member states. Although free access to the labour market was not granted by all countries initially, the nationals of the new Member countries could nonetheless move, search for work and be hired in any EU15 country, even those imposing transition measures, subject to standard verifications in the destination country of labour market needs. There is a clear advantage in being on-site to search for work as opposed to being recruited from abroad as well as lower moving costs and the possibility of returning to the home country without penalty at any time.

Still, one should not exaggerate the handicap of migration regulations. Governments are not entirely free to restrict movements, essentially because of signed international treaties (the Geneva Convention) and generally recognised human rights (the right of residents to live with their families or to marry or adopt whom this wish). And family and humanitarian migrants can enter the labour market after arrival (or after being recognised as refugees in the case of asylum seekers), generally without restrictions. In many cases, moreover, entry into the labour market is not "blind" but aided by information on opportunities available either transmitted by co-nationals prior to arrival or once on-site.

The one category of third-country migration which is largely discretionary is labour migration, although here, most countries have considerably loosened restrictions with respect to skilled migration, allowing employers to recruit from abroad with far fewer constraints than used to be the case. Temporary labour migration is generally broader in

scope, but more strictly regulated and in any event does not enter into the scope of what is being considered here, because temporary labour migrants are not lasting residents of destination countries or continuing participants in their labour markets.

The essential point with regard to the analysis which follows is that although governments can define the characteristics of migrants which they are willing to admit in the case of discretionary labour migration, this is less the case for both free movement or family and humanitarian migration of third-country nationals, neither of which requires direct recruitment efforts by employers, although both may be influenced by information about labour market conditions relayed back to origin countries.

A general overview of the skill level of EU/non-EU migrants and their entry into growing and declining occupations over the 2000-10 decade

The expansion of the European Union to 12 new member states brought with it a significant increase in intra-EU movements, mostly by young workers of the new member states looking for higher wages in the labour markets of EU15 countries. It has become axiomatic that part of this movement consisted of medium and highly educated workers often taking on lesser skilled jobs. The reasons for this vary and can include linguistic deficiencies, job availability or the fact that for many, the movement was intended to be temporary from the beginning, with a quick return from jobs whose salaries although low were already advantageous compared to those back home.

What role then did free-circulation migrants play in occupational change in EU countries over the decade; compared to non-EU migrants and how did both of these groups differ in this respect from resident new entrants into the labour market? The period being considered here (2000-10) straddles the economic crisis and the results to be presented have clearly been affected by it. But many of the jobs lost as a result of the downturn, especially in construction, are unlikely to return and although it may be of interest to examine occupational change pre- and post-crisis, neither of these periods in retrospect can be considered to represent "typical" economic conditions for an analysis of the dynamics of occupational change. The economic downturn in a certain sense has corrected the excesses of the period immediately preceding it and conclusions drawn on the basis of the entire decade may be informative with respect to the future than those on the basis of pre-crisis conditions or on the immediate effects of the crisis itself.

Table 4.5 gives an overview of occupational entries by occupational skill level, for EU and non-EU migrants and for resident new entrants, who are the reference group for this analysis. There is considerable heterogeneity across countries, which makes it difficult to draw a general picture. Averaging over EU countries is problematical, because of the presence of many countries having very few migrants (the accession countries). A sum over countries to obtain an EU total, on the other hand, is strongly influenced by the situation of Southern European countries, who had significant numbers of migrants but where the pattern of migration was somewhat different from the rest of Europe.

Table 4.5. Distribution of occupational entries over 2000-10 by skill level, migrants and resident new entrants

Percentages

	Occupational entries (share of total)		EU migrants			Non-EU migrants			Resident new entrants		
	EU migrants	Non-EU migrants	Professionals, technicians and associate professionals	Clerks, service workers, skilled trades, machinery operators	Elementary occupations	Professionals, technicians and associate professionals	Clerks, service workers, skilled trades, machinery operators	Elementary occupations	Professionals, technicians and associate professionals	Clerks, service workers, skilled trades, machinery operators	Elementary occupations
Finland	2.9	4.4	32	49	19	25	46	29	47	47	6
Czech Republic	2.8	2.3	38	55	6	22	60	18	48	51	2
Denmark	6.6	10.8	40	44	17	31	45	25	58	40	2
France	2.7	6.3	31	51	18	21	53	25	44	49	7
Netherlands	3.3	5.3	45	39	17	24	48	27	56	38	6
Sweden	5.4	10.9	48	42	10	26	53	22	43	52	5
Austria	10.3	10.7	37	47	16	14	48	38	44	48	8
Belgium	11.4	10.6	38	48	14	21	54	25	46	49	5
Bulgaria	0.0	0.1	100	-	-	58	18	25	28	58	14
Estonia	0.9	1.4	62	24	14	34	47	18	46	51	3
Hungary	3.0	0.5	42	48	11	35	60	5	39	53	8
Lithuania	0.2	1.2	71	29	-	34	63	3	55	42	3
Latvia	0.1	1.7	-	25	75	24	68	8	45	44	10
Poland	0.1	0.2	70	27	3	41	44	15	38	56	6
Romania	0.1	0.0	76	24	-	33	67	-	35	51	14
Slovenia	0.4	2.8	85	15	-	13	65	22	48	44	8
Slovak Republic	0.4	0.2	74	26	-	45	55	-	41	52	7
United Kingdom	12.6	16.7	22	49	29	38	46	17	44	46	11
Ireland	33.4	12.9	16	63	21	38	52	10	59	43	-
Luxembourg	48.2	9.0	67	25	8	65	20	14	64	31	5
Malta	1.9	2.1	44	46	10	41	48	12	41	47	12
Spain	11.1	29.3	14	54	32	9	51	40	47	50	3
Greece	5.2	16.5	6	50	44	2	54	43	40	56	4
Cyprus[1,2]	23.2	26.9	14	55	31	7	23	70	49	49	2
Italy	11.0	15.1	9	54	37	4	53	43	39	55	7
Portugal	2.3	13.4	23	57	20	5	63	33	37	57	5
Switzerland	25.4	12.7	56	39	5	34	52	14	50	47	3
Iceland	0.0	0.0	-	-	-	-	-	-	66	31	2
Norway	8.7	10.2	32	58	10	25	55	21	48	51	1
Total EU	6.9	11.3	21	51	28	17	51	32	43	50	7
Average EU countries	7.7	8.1	44	42	21	27	50	24	45	48	7

Note: The estimates for new member countries are based on small samples and subject to caution.

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Source: Labour Force Surveys. See Table 4.A2.1 in the annex.

Figure 4.6 shows this heterogeneity with regard to highly skilled occupations in a particularly striking way, the countries having been grouped according to their similarity with regard to entries by migrants into these occupations.

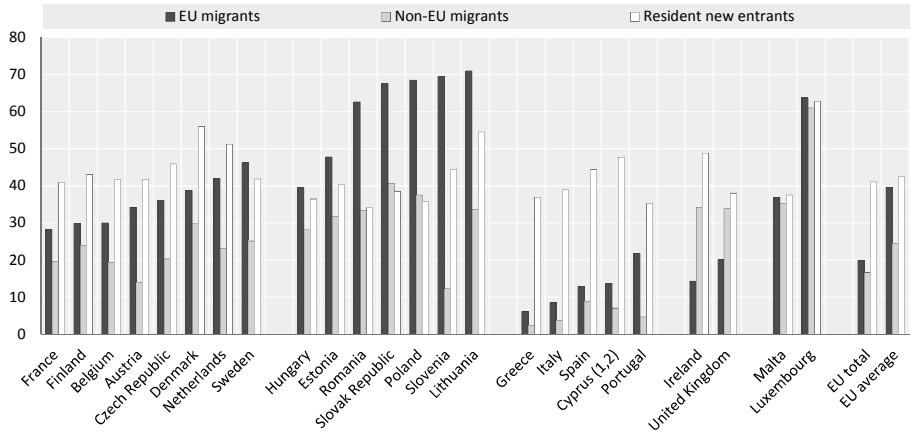
With few exceptions the share of high-skilled occupations in total occupational entries for EU migrants exceeds that of non-EU migrants. For the United Kingdom and Ireland it is the reverse, and for Malta and Luxembourg levels of both EU and non-EU migrants are similar. However, the significance of highly skilled migration in total migration varies considerably, with the share for EU migrants and non-EU migrants tending to be, roughly speaking, similar.

There are more or less natural country groupings for the results, with Southern Europe being characterised by a low presence of new immigrants in high-skilled occupations, both in absolute terms and compared to young new entrants; most new member states, by a very high presence (but limited number) of EU migrants in high-skilled jobs compared to non-EU migrants and indeed to resident new entrants as well; and finally "old" EU countries plus the Czech Republic where EU-migrants are between non-EU migrants and resident new entrants with respect to incidence of entry into high-skilled jobs.

The situation of Ireland and the United Kingdom is unique and telling, because these two countries attracted the largest number of accession country migrants following enlargement. The effect of enlargement for these two countries has thus been ostensibly to open up lesser skilled jobs in their labour markets to a new group of EU migrants, and thereby to change the skill distribution of jobs taken up by EU nationals. Whether this would have occurred in Ireland and the United Kingdom had all EU countries opened up their labour markets to accession-country nationals from the outset is difficult to say. Probably not, as migrants may well have fanned out over a larger group of destination countries, diluting the impact on low-skilled jobs in these two countries. The pattern observed there may persist for a while because migration channels and networks are now in place, but since the choice of destination country is currently broader and as wages and living conditions in origin countries improve further, it seems likely that the standard pattern observed everywhere else, namely, a greater take-up of high-skilled jobs by EU migrants than by non-EU migrants will re-assert itself in the United Kingdom and Ireland as well.

Figure 4.6. Share of high-skilled occupations in total occupational entries, migrants and new entrants, 2010-11

Percentage



Note: High-skilled occupations consist of professionals, associate professionals and technicians.

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Source: Labour Force Surveys. See Table 4.A2.1 in the annex.

The situation in Southern Europe is of interest. As noted earlier; the countries of Southern Europe are characterised by the largest differences in educational attainment between retiring and entering cohorts of any OECD country. In a sense, the educational attainment of their populations has changed faster than the nature of jobs in the economy. Low-skilled jobs are plentiful but find no takers, drawing in immigrants to satisfy the demand. High-skilled jobs are oversubscribed and attract few immigrants from outside.

Central European countries, on the other hand, show a different situation. These are relatively low-wage economies compared to the rest of the European Union. Immigrants are present in very limited numbers and likely represent highly educated persons from other EU countries seeking opportunities in their expanding economies or persons sent in by parent companies who have established subsidiaries in these countries.

Perhaps the "mainstream" pattern is that seen in Nordic Europe, Belgium, the Netherlands, France and Austria, plus the Czech Republic, where EU migrants occupy proportionally fewer high-skilled jobs than resident new entrants, and non-EU migrants, fewer still. Linguistic deficiencies and non-equivalent or non-recognised qualifications come to mind as possible reasons, with non-EU migrants being less favoured on both counts. The pattern does not seem to depend on the extent of EU or non-EU high-skilled occupational entries which vary from about 2 to 11% for both EU and non-EU migrants.[10]

An analysis of entry into growing and declining occupations by EU and non-EU migrants, respectively, shows a picture that does not provide significant new information, essentially because growing occupations tend to be highly skilled and declining ones medium-skilled.

The general picture then is not a homogeneous one and depends significantly on the labour market in individual countries. The one new element that appears to have altered migration patterns in Europe is EU enlargement, where it has opened the lesser skilled job market in Ireland and the United Kingdom to accession country migrants. As of 2010 there was no sign that that this had occurred enough elsewhere to change the mainstream migration pattern, which has tended to show EU migrants taking on skilled jobs more than those from third countries. This pattern is likely a consequence of the fact that third-country migration remains family and humanitarian in character, despite the opening up to highly skilled labour migration in recent years, and that language proficiency and origin of qualifications issues tend to be more significant for such migrants than for free circulation migrants, whose choice is less constrained by migration regulations and may be more responsive to economic considerations.

Whether the mainstream pattern will persist will depend on the extent of third-country labour migration in future years and on the types of jobs for which third-country migrants will be recruited. An emphasis on highly skilled jobs will result in a convergence between third-country and EU migration with respect to occupational skills; a broadening of the jobs for which recruitment is allowed will instead likely perpetuate the status of third-country migrants as a somewhat less-skilled reserve for employers than EU migrants.

4.6. Occupational change: The gender dimension

Before examining how gender and migration have interacted in occupational change over the 2000-10 decade, we first look at the picture for resident new entrants. It is well known that tertiary graduation rates of young women have been exceeding those of young men in many countries for some time now, and one might naturally expect this change to manifest itself with respect to labour market outcomes. Table 4.6 confirms this, showing that

proportionally more women enter professional and associate professional occupations and proportionally fewer enter medium-skill occupations. Indeed there is only one country (Finland) where the percentage of women entering professional occupations is less than that of men (Figure 4.7a) and only three countries (Belgium, Ireland and Portugal) where this is the case for technician and associate professional occupations (Figure 4.7b). EU countries on average showed 37% of men entering highly skilled occupations (professional, technician and associate professional) over the 2000-10 decade and 50% of women doing so.

Table 4.6. Distribution of occupations of resident new entrants by gender, 2000-10

Percentages

	Men					Women				
	Senior official and managers	Professionals	Technicians and associate professionals	Clerks, service workers, skilled trades, machinery	Elementary occupations	Senior official and managers	Professionals	Technicians and associate professionals	Clerks, service workers, skilled trades, machinery	Elementary occupations
Bulgaria	6	10	11	59	15	4	24	11	51	10
Italy	nu	10	24	59	7	nu	12	33	49	6
Austria	7	12	28	44	10	2	13	31	48	7
Czech Republic	4	13	28	55	1	4	17	39	37	3
Slovak Republic	5	13	15	57	9	6	22	32	37	3
Malta	9	13	14	50	13	6	31	23	32	8
Norway	3	15	26	54	1	3	16	35	45	1
Greece	10	15	14	57	4	5	29	18	44	4
Poland	7	16	12	60	6	5	30	16	43	5
France	8	16	22	49	5	7	17	27	43	7
Romania	2	17	10	55	16	2	26	18	42	12
Portugal	6	17	16	58	3	4	24	14	51	7
Latvia	10	17	15	46	12	7	28	22	35	7
Slovenia	8	17	21	45	8	7	28	23	35	7
Sweden	4	18	20	53	5	3	21	25	46	5
United Kingdom	15	19	17	36	13	11	21	19	44	5
Hungary	7	19	12	55	7	5	24	20	43	8
Spain	7	19	19	53	2	5	27	23	41	4
Germany	5	20	21	48	6	4	20	33	38	4
Estonia	15	21	10	50	4	9	31	20	39	2
Cyprus[1,2]	5	21	18	49	7	1	37	21	46	-
Switzerland	nu	22	23	52	2	nu	17	38	41	3
Lithuania	nu	23	21	50	6	nu	35	29	36	1
Belgium	10	24	13	48	5	8	37	10	40	5
Denmark	4	25	24	43	4	2	26	38	36	-
Netherlands	11	25	20	37	6	5	33	24	32	5
Finland	11	26	15	42	6	5	23	23	44	4
Iceland	6	28	21	44	2	5	48	32	13	2
Luxembourg	1	29	25	39	6	2	39	33	21	5
Ireland	23	35	13	34	-	14	38	11	37	0
Total EU	7	17	19	50	7	5	22	25	42	5
Average EU countries	8	19	18	49	7	5	26	24	40	5

Note: nu = data not usable, nr = data not reliable.

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: Labour Force Surveys. See Table 4.A2.1 in the annex.

Figure 4.7a. New entrants in professional occupations as a percentage of all new entrants, by sex in 2000-10

Percentages

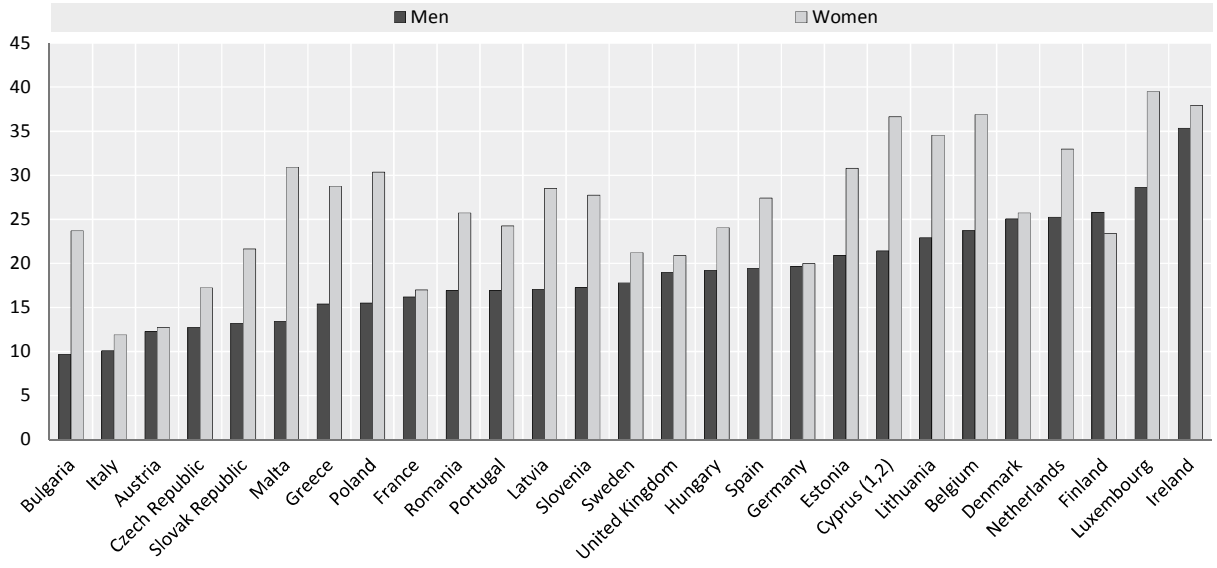
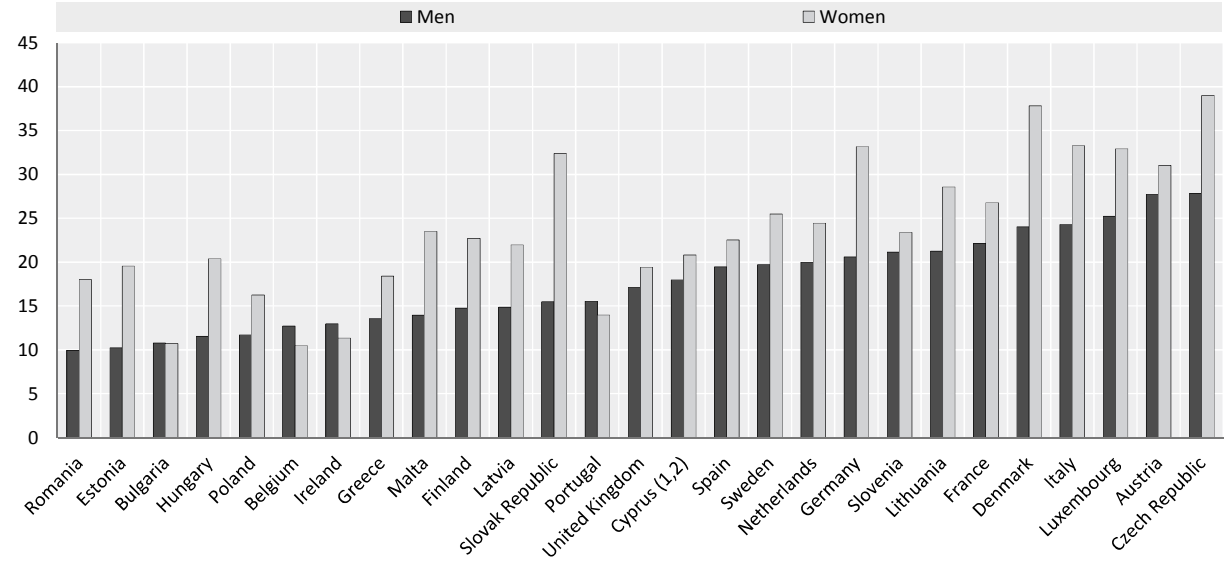


Figure 4.7b. New entrants in technician and associate professional occupations as a percentage of all new entrants, by sex in 2000-10

Percentages



1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

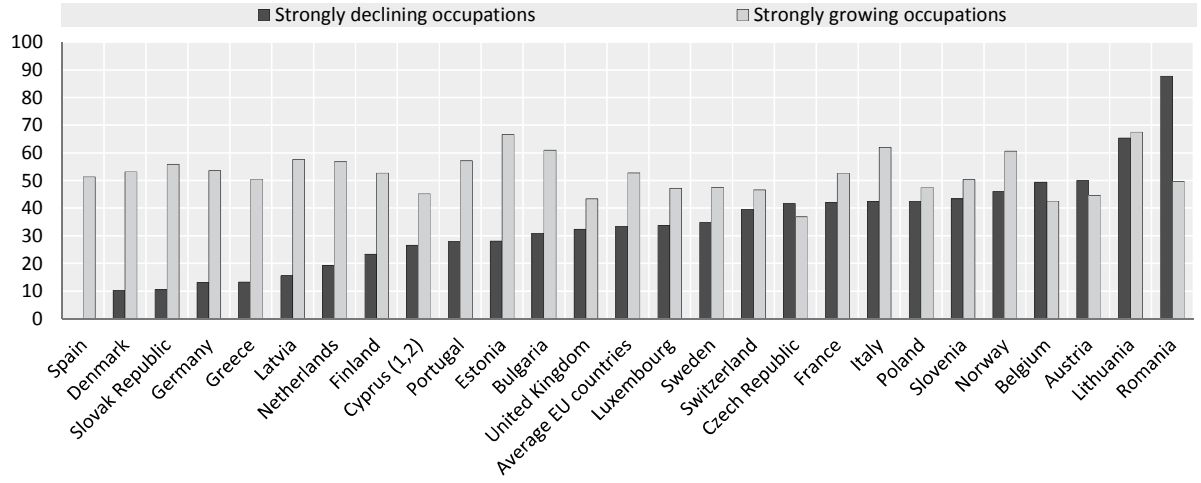
2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: Labour Force Surveys. See Table 4.A2.1 in the annex.

In terms of strongly growing and strong declining occupations (occupations with the strongest and weakest growth rates over the 2000-10 decade, each accounting for 20% of total employment), young women were also generally under-represented among entries into the most strongly declining occupations and overrepresented among entries into the most strongly growing ones. The average across EU countries mirrors that observed for skills, with only one third of entries into the most strongly declining occupations over 2000-10 being accounted for by women, but over 52% of entries into the most strongly growing ones (Figure 4.8). The future of jobs and skills appears to be more and more a feminine one.

Figure 4.8. Share of women in occupational entries in strongly declining and strongly growing occupations, resident new entrants, 2000-10

Percentages



1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

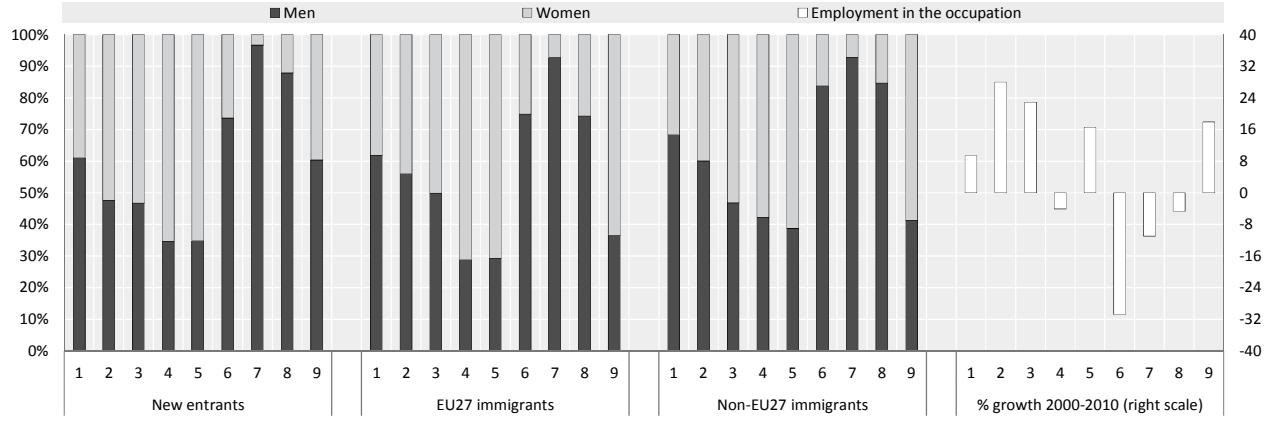
2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: Labour Force Surveys. See Table 4.A2.1 in the annex.

With one exception, the occupational job market for new immigrants with respect to gender resembles very much that for resident new entrants. Figure 4.9 shows directly the share of men and women among entries into each of the ISCO major occupational groups, for both resident new entrants, EU27 immigrants and non-EU27 immigrants, as well as the growth rates observed for the ISCO major groups over the 2000-10 period. The pattern across all three groups is remarkably concordant. The one exception concerns elementary occupations (ISCO major group 900), which immigrant women enter more often than new entrants. The reason may be found precisely in the fact that more and more women generally are entering the high-skilled labour market, opening up significant needs for care workers in the household sector. There were also proportionally many more men, whether new entrants or immigrants, entering the most strongly declining occupations over the 2000-10. Whether these occupations will continue to decline in the future remains to be seen.

The gender dimension in occupational change has thus become a prominent one in many countries, with many medium-skilled occupations dominated by men declining in importance. Conversely, high-skilled occupations are increasing in importance, but such occupations have not been "female" in the past. They are becoming more and more so, however, perhaps because educational attainment levels of young men are not keeping pace with those of young women. One surprise, however, is that the same pattern of occupational "dominance" is observed for new immigrants from third countries, whom one would not expect to be necessarily subject to the same pattern of differences in educational outcomes observed in OECD countries. That they are suggests that this may be a worldwide phenomenon. This is one element of future change which may bear a closer look, with regard to ageing populations.

Figure 4.9. Share of men and women in occupational entries and growth in employment, by ISCO major occupational group, new entrants and new immigrants, 2000-10



1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: Labour Force Surveys. See Table 4.A2.1 in the annex.

4.7. Conclusion

The objective of this chapter was to examine the role of demography in educational and occupational changes, to shed some light on the role which immigrants have played and can be expected to play in the future as labour markets respond to the retirement of baby-boomers and the entry of smaller youth cohorts into working life. The chapter also analyses the fields of study of tertiary-educated workers and attempts to determine if it could be an explanatory element in differences in skill use in the labour market between immigrant and native-born populations.

Over the past decade, the upskilling of jobs has gone hand-in-hand with increasing levels of educational attainment. Generally, high-skilled occupations have grown

strongly, low-skilled occupations somewhat less so, while medium-skilled occupations have declined or stagnated.

In growing occupations, the number of entrants largely outpaced the number of exits into retirement, while at the other end of the spectrum, the reverse was generally the case. New immigrants contributed 16% of entries into growing occupations and 26% of entries into declining occupations.

In rapidly growing occupations, the large surplus of new entrants over retirees means that many of the jobs were newly created, for which there appeared to be no shortage of domestic candidates, among both new entrants and prime-age workers. But many new immigrants were also hired into these jobs, indicating that domestic sources were not sufficient to satisfy all of the needs. At the same time, new immigrants replaced only a fraction of retiring workers in declining occupations. Many of the jobs were cut after their incumbents retired.

In other words, a surplus of entrants over retirees among residents may not be enough to obviate the need for labour migrants, nor does a significant deficit imply a major shortfall of workers that must be filled through recruitment from abroad. Observed and future labour and skill shortages are not a simple function of demographic imbalances in the labour force, but depend significantly on the changing nature of demand for particular skills and the extent to which these can be filled from existing sources of supply. In a sense this is obvious, but the scale of ongoing and future demographic changes is large and the prospect of a drop in the labour force and perhaps even in the size of the economy, has tended to dominate discussions in this area, at the expense of more in-depth discussion of the dynamics of occupational change.

The links between changes in the occupational structure, demographic imbalance and the need for immigrant workers are thus far from obvious. This is all the more the case since many immigrants have arrived as a result of family and humanitarian reasons rather than having been directly recruited from abroad by employers. Their lesser-or-greater presence in certain occupations may thus reflect the fact that in many cases their arrival was not linked to a labour shortage such as is generally the case for labour migrants, but rather reflected a fortuitous match between whatever skills they brought with them and available jobs in a labour market where there were many other players.

For some immigrants, low levels of education constrained their occupational choices to low-skilled jobs and for others, the education and work experience earned abroad made them sometimes ill-prepared to compete with the skills of recently graduated young workers and of prime-age workers already having made their way in the labour market.

The analyses presented here illustrate that the labour market is highly dynamic. The objective of this analysis was to focus more precisely on the impact of ageing on the educational attainment of the labour force and on occupational changes, and the role of labour migration in this dynamic process.

What emerges is that labour market changes are more rapid than demographic changes and many future jobs are likely to be significantly different from those held by cohorts which will be retiring over the next twenty years. International migrants will not be replacing retiring baby-boomers, but rather responding to the labour and skill requirements of rapidly changing labour markets.

An analysis of the role of EU/non-EU migrants in occupational change reveals considerable heterogeneity across countries. The general pattern is that of proportionally

more entries into higher skilled occupations on the part of EU migrants, except in Ireland and the United Kingdom, but a considerable variation across country groups with regard to the importance of high-skilled jobs in entries.

In Southern Europe, entries into such jobs are relatively few, regardless of the origin of the migrants; in Central Europe, relatively frequent, but there are few migrants. The mainstream pattern is that entries for EU migrants are somewhere in between that observed for third-country migrants and resident new migrants. This pattern may change but will depend on future recruitment patterns.

Finally occupational change over the 2000-10 decade shows a tendency towards a feminisation of high-skilled jobs and a greater presence of women in growing than in declining occupations. There were also proportionally more men in strongly declining occupations. The same pattern was observed for immigrants, whether from EU countries or not, which suggests that the segmentation by gender represents a fundamental change in the labour market.

Notes

1. It is on average about one third larger than the previous ten-year age cohort.
2. Some persons who leave a particular occupation, for example, consist of persons who died or left the country over the observed period. The essential point is that they are no longer in the labour force or employed in their occupation at the end of the period. Likewise, some who enter an occupation are native-born expatriates who return from abroad; they also are not identified specifically
3. Two groups are excluded, namely subsistence agricultural and fishery workers (sub-major group 62) and the armed forces (major group 0).
4. The tertiary attainment share of employment in an occupational group drops off strongly thereafter in the United States, to 30%, whereas the category of associate professionals and technicians in European countries shows tertiary attainment percentages ranging from 33 to 50%. Occupations in these groups would appear to be included in the highly educated 1-to-10 numbered group in the United States.
5. A measure of turnover would in principle show how much the composition of the labour force has changed due to entry and exit. The measure given here (net turnover) is an approximation which underestimates the total turnover. It is estimated as half the sum of the absolute value of contributions to labour force change of new entrants, new immigrants, prime-age workers and older workers.
6. The number of persons employed per quintile is not exactly 20% because the requirement that an occupational group be entirely within a quintile creates some imbalance in the quintile sizes.
7. The correlations are calculated, across occupations, between the rate of growth of the occupation and the contribution of each demographic group to the total growth.
8. Because the US Standard Occupational Classification does not include a skill classification for occupations, for the purpose of the analysis presented here, skill levels were assigned to occupations on the basis of the educational attainment of the incumbents. High-skilled occupations were defined to be those for which at least 55% of the holders had a tertiary qualification and mid-skilled those among the remaining for which at least 70% of persons employed had at least upper secondary education.
9. Luxembourg is an outlier and has been excluded from the calculation.
10. Note that the results in Table 4.5 suggest that entries of EU migrants into highly skilled occupations are at least as significant with respect to total entrants into these occupations in Austria and Belgium as they are in the United Kingdom.

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Annex 4.A1

Methodology for estimating the components of demographic change

The components of demographic change identified in this Part are derived using some basic demographic accounting methods, applied to changes in educational attainment, in the labour force and in the distribution of employment by occupation.

Roughly speaking, the method rests on the following general equality concerning the measure of change in a particular characteristic between time t1 and time t2:

$\Delta(T) = E + I + \Delta(PA) - R,$

where $\Delta(T)$=the Total change observed in the characteristic over the period, E = new non-immigrant entrants over the period, I = new immigrants who arrived over the period, $\Delta(PA)$ = change in the prime-age group over the period, and R= retirees over the period.

This amounts approximately to change =inflows – outflows, except that one allows for internal change in the stocks as well as distinguishing between internal inflows (new entrants) and external ones (immigration). External outflows (deaths and emigration) are included implicitly in each of the four components and are essentially netted out.

For almost all countries, the decomposition is applied in this Part to change over the 2000-10 period and is based on labour force survey data. We will describe the method in general for changes in the labour force, before explaining a number of technicalities resulting from its application to specific cases. The basic components are as follows

- New entrants = the labour force 15-34 in 2010, less persons 15-24 who were already in the labour force in the year 2000. This approximates young persons who entered the labour force over the period. It assumes that all persons 15-24 who were part of the labour force in 2000 are still in the labour force ten years later, when they are 25-34 years of age.
- Retirees = the labour force 45+ in 2000 less the labour force 55+ in 2010. Temporary withdrawals and re-entries prior to definitive retirement are implicitly netted out.
- Prime-age workers = the labour force 35-54 in 2010, less the labour force 25-44 in 2000.
- New immigrants = immigrants in 2010 with duration of residence of ten years or less. Note that this implies that this group has to be excluded from all the other components above involving 2010 data, to avoid double-counting.

As can be verified, the net change in the labour force 15 years of age and older is the sum of these four components, and the sum is perfectly additive, modulo non-response.

The decomposition of change described above can be applied to each educational attainment level within the labour force. However, new entrants now have a more precise meaning, namely persons who completed their education over the period and entered the labour force, provided one excludes persons still in education from the calculation. The change for prime-age workers represents educational upgrading for this group as well as, implicitly, loss due to emigration or death.

New entrants are now estimated as follows: persons 15-24 not in education in 2010 + (persons 25-34 in 2010 – persons 15-24 not in education in 2000), for each educational attainment level.

The first term consists of persons who in principle have completed their education by 2010. For the second term, not all persons 25-34 have completed their education. However, since it is tertiary attainment that is of interest, it is assumed that persons 25-34 who are still in education will already have at least a first tertiary degree. The tertiary attainment levels of those who do not (and there are some) will show up as educational upgrading among persons who are 25-44 in 2000 and 35-54 in 2010. This is not ideal, but it is difficult to take into account sensibly situations in which a first tertiary degree is completed without interruption at a late age.

From the population of persons 25-34 in 2010, one subtracts persons from the same cohort who had already completed their education in 2000, namely persons 15-24 not in education.

This kind of decomposition can be carried out for various characteristics, in particular occupation or sector, and by gender, to provide an indication of the demographics of change for each of these characteristics.

Annex 4.A2

Occupational change and overqualification

Table 4.A2.1. Decomposition of occupational change by growth quintile and source, 2000-10

Thousands

	Young workers	New immigrants - EU27	New immigrants - non- EU27	New immigrants - total	Prime-age workers	Older workers	Net change in employment 2000-2010	2000 level employment
Austria	**809**	**110**	**110**	**220**	**- 26**	**- 589**	**413**	**3 671**
1	103	20	20	40	- 187	- 196	- 240	1 019
2	156	24	18	42	- 112	- 144	- 58	872
Quintile 3	160	18	31	49	36	- 173	71	873
4	181	27	21	49	61	- 70	220	600
5	209	21	20	40	177	- 5	420	307
Belgium	**932**	**156**	**128**	**284**	**- 148**	**- 712**	**382**	**4 078**
1	198	31	30	61	- 242	- 262	- 239	1 372
2	135	24	19	43	- 22	- 121	38	646
Quintile 3	192	26	23	50	6	- 156	95	756
4	152	29	33	61	9	- 84	146	640
5	255	45	24	69	100	- 88	342	663
Bulgaria	**583**	**0**	**1**	**1**	**210**	**- 618**	**177**	**2 842**
1	102	0	0	0	- 87	- 269	- 253	866
2	99	0	0	0	13	- 157	- 45	680
Quintile 3	120	0	0	0	50	- 75	95	501
4	103	0	0	0	77	- 65	116	329
5	159	0	0	0	157	- 52	263	466
Switzerland	**637**	**261**	**131**	**393**	**- 94**	**- 618**	**325**	**3 643**
1	66	28	17	45	- 72	- 170	- 131	855
2	144	56	37	93	- 68	- 153	18	933
Quintile 3	115	51	16	67	- 5	- 91	88	590
4	158	51	30	82	23	- 113	152	644
5	154	75	31	106	29	- 91	199	620
Cyprus[1,2]	**69**	**32**	**37**	**69**	**- 5**	**- 41**	**92**	**290**
1	9	8	5	12	- 12	- 15	- 5	79
2	19	6	4	10	- 6	- 9	14	76
Quintile 3	14	8	4	12	- 2	- 7	17	51
4	18	3	1	5	8	- 6	25	47
5	9	6	23	29	7	- 4	41	38
Czech Republic	**978**	**29**	**24**	**53**	**195**	**- 1 013**	**213**	**4 657**
1	74	5	8	12	- 119	- 293	- 326	1 149
2	239	8	5	13	- 48	- 262	- 58	1 218
Quintile 3	179	4	2	6	81	- 214	52	893
4	218	7	7	14	123	- 129	226	752
5	269	5	3	8	159	- 116	320	645
Germany	**6 957**	**na**	**na**	**1 093**	**805**	**- 6 535**	**2 453**	**36 105**
1	1 223	na	na	245	- 628	- 1 900	- 1 023	9 868
2	926	na	na	100	- 2	- 1 101	- 60	5 934
Quintile 3	985	na	na	293	226	- 1 218	319	6 154
4	1 930	na	na	176	713	- 1 488	1 352	7 908
5	1 892	na	na	279	496	- 828	1 864	6 242
Denmark	**448**	**36**	**58**	**94**	**- 57**	**- 549**	**5**	**2 702**
1	32	7	7	15	- 87	- 192	- 219	744
2	65	9	17	27	- 32	- 130	- 56	649
Quintile 3	120	6	15	21	- 5	- 99	53	510
4	117	5	9	14	10	- 66	84	472
5	114	8	10	18	57	- 61	142	327
Estonia	**130**	**1**	**2**	**3**	**- 14**	**- 121**	**0**	**568**
1	14	0	1	1	- 32	- 34	- 52	149
2	22	0	0	1	3	- 40	- 14	158
Quintile 3	24	0	0	0	- 4	- 24	- 2	82
4	42	1	0	1	6	- 18	31	107
5	28	0	0	1	13	- 5	37	72
Spain	**3 175**	**589**	**1 511**	**2 100**	**81**	**- 2 364**	**2 993**	**15 359**
1	301	173	357	530	- 728	- 1 006	- 902	4 817
2	566	66	116	182	96	- 556	288	3 082
Quintile 3	662	72	207	279	100	- 282	758	2 387
4	493	134	435	569	257	- 287	1 031	2 217
5	1 154	144	396	540	357	- 232	1 819	2 858

Table 4.A2.1. Decomposition of occupational change by growth quintile and source, 2000-10 *(cont.)*

Thousands

	Young workers	New immigrants - EU27	New immigrants - non- EU27	New immigrants - total	Prime-age workers	Older workers	Net change in employment 2000-2010	2000 level employment
Finland	**468**	**14**	**21**	**36**	**20**	**- 443**	**82**	**2 355**
1	59	3	3	7	- 111	- 161	- 206	714
2	98	2	2	4	- 19	- 99	- 16	473
Quintile 3	86	4	8	12	45	- 88	56	491
4	108	2	2	4	43	- 62	93	398
5	117	4	6	9	61	- 33	155	280
France	**5 881**	**180**	**410**	**590**	**747**	**- 4 657**	**2 609**	**22 847**
1	1 017	19	57	76	- 830	- 1 463	- 1 192	6 279
2	962	48	97	145	- 228	- 1 008	- 124	4 720
Quintile 3	1 490	37	96	133	145	- 916	863	4 833
4	1 265	22	40	62	586	- 667	1 257	3 539
5	1 148	54	120	173	1 074	- 604	1 804	3 475
Greece	**798**	**50**	**158**	**209**	**66**	**- 806**	**267**	**4 057**
1	69	6	20	26	- 56	- 336	- 297	1 167
2	147	7	38	45	- 25	- 162	5	861
Quintile 3	172	10	19	30	17	- 133	85	752
4	178	7	28	36	44	- 92	166	652
5	233	20	52	72	86	- 83	309	625
Hungary	**730**	**22**	**5**	**27**	**34**	**- 795**	**- 4**	**3 760**
1	87	5	0	5	- 120	- 216	- 244	1 044
2	123	2	1	3	3	- 158	- 29	689
Quintile 3	134	1	1	2	- 2	- 139	- 5	667
4	221	7	2	10	56	- 192	94	921
5	165	6	0	6	97	- 89	179	440
Ireland	**267**	**154**	**58**	**212**	**- 84**	**- 227**	**171**	**1 664**
1	3	35	7	42	- 98	- 103	- 155	529
2	16	39	8	47	- 20	- 41	3	302
Quintile 3	80	27	8	35	- 10	- 36	70	350
4	79	33	18	50	3	- 23	109	259
5	89	20	17	37	42	- 25	144	223
Italy	**3 520**	**526**	**718**	**1 245**	**15**	**- 3 996**	**808**	**20 024**
1	433	62	101	163	- 1 045	- 1 442	- 1 887	5 513
2	624	61	74	135	- 245	- 855	- 336	4 203
Quintile 3	1 030	88	121	209	107	- 977	376	4 968
4	698	156	177	333	287	- 447	875	2 967
5	736	159	246	405	910	- 276	1 781	2 373
Lithuania	**259**	**1**	**3**	**4**	**- 82**	**- 275**	**- 94**	**1 295**
1	13	0	0	0	- 79	- 146	- 211	457
2	40	0	1	1	- 38	- 49	- 46	270
Quintile 3	49	0	1	1	- 8	- 43	- 2	243
4	63	0	1	1	1	- 34	31	229
5	94	0	1	1	42	- 3	134	96
Luxembourg	**33**	**39**	**7**	**46**	**- 7**	**- 32**	**39**	**181**
1	6	5	1	5	- 13	- 16	- 18	68
2	4	6	2	8	- 5	- 7		43
Quintile 3	6	4	1	4	1	- 4	7	22
4	11	8	1	9	7	- 4	23	29
5	6	16	3	18	4	- 1	27	19
Latvia	**218**	**0**	**4**	**4**	**- 36**	**- 191**	**- 2**	**940**
1	22	0	1	1	- 60	- 88	- 125	319
2	30	0	1	1	- 6	- 32	- 7	162
Quintile 3	62	0	2	2	- 17	- 40	8	217
4	37	0	0	0	14	- 20	32	139
5	67	0	0	0	34	- 11	90	103
Malta	**42**	**1**	**1**	**2**	**2**	**- 25**	**21**	**142**
1	3	0	0	0	- 6	- 9	- 12	40
2	12	0	0	1	- 4	- 7	1	40
Quintile 3	7	0	0	0	3	- 6	5	27
4	10	0	0	0	0	- 2	8	18
5	12	0	0	1	8	- 1	20	17
Netherlands	**1 547**	**54**	**87**	**141**	**- 160**	**- 1 077**	**519**	**7 820**
1	200	9	14	23	- 221	- 320	- 306	1 919
2	354	12	24	36	- 83	- 231	95	1 971
Quintile 3	234	11	20	32	56	- 201	129	1 323
4	350	9	19	28	19	- 177	238	1 386
5	409	12	10	22	69	- 148	363	1 221
Norway	**479**	**51**	**59**	**112**	**- 4**	**- 354**	**233**	**2 262**
1	47	14	20	35	- 81	- 159	- 158	713
2	104	12	8	20	1	- 75	51	430
Quintile 3	70	5	5	11	6	- 36	51	285
4	144	12	19	31	19	- 61	132	542
5	113	8	7	15	52	- 23	157	292

Table 4.A2.1. Decomposition of occupational change by growth quintile and source, 2000-10 *(cont.)*

Thousands

	Young workers	New immigrants - EU27	New immigrants - non- EU27	New immigrants - total	Prime-age workers	Older workers	Net change in employment 2000-2010	2000 level employment
Poland	**4 605**	**5**	**10**	**15**	**- 22**	**- 3 244**	**1 353**	**14 518**
1	459	0	2	2	- 438	- 1 193	- 1 171	3 979
2	1 022	1	2	3	- 268	- 950	- 193	4 194
Quintile 3	928	1	1	2	- 24	- 468	439	2 467
4	981	1	3	4	91	- 396	680	2 318
5	1 215	2	2	4	617	- 238	1 597	1 560
Portugal	**864**	**24**	**134**	**158**	**- 123**	**- 916**	**- 18**	**4 971**
1	55	5	36	41	- 187	- 290	- 381	1 336
2	118	4	9	13	- 39	- 214	- 123	1 192
Quintile 3	195	5	24	30	- 42	- 170	13	912
4	225	6	59	64	64	- 162	192	946
5	272	4	5	9	81	- 81	281	585
Romania	**1 939**	**1**	**1**	**2**	**- 665**	**- 3 011**	**- 1 735**	**10 898**
1	14	0	0	0	- 404	- 1 952	- 2 342	4 584
2	246	0	0	0	- 347	- 245	- 346	1 477
Quintile 3	505	0	0	0	- 169	- 443	- 106	2 159
4	655	0	0	1	57	- 306	407	1 590
5	519	1	0	1	198	- 66	652	1 088
Sweden	**936**	**60**	**120**	**181**	**111**	**- 817**	**420**	**4 115**
1	135	10	19	30	- 106	- 291	- 230	1 126
2	164	10	13	23	5	- 172	21	686
Quintile 3	266	13	57	71	- 28	- 167	144	1 021
4	189	9	13	23	79	- 103	190	653
5	182	16	18	35	161	- 84	295	630
Slovenia	**234**	**1**	**7**	**8**	**- 5**	**- 170**	**68**	**894**
1	24	0	2	2	- 43	- 70	- 87	289
2	45	0	2	2	- 20	- 39	- 13	207
Quintile 3	41	1	1	2	7	- 24	26	127
4	65	0	1	1	21	- 28	60	171
5	59	0	1	1	30	- 9	82	101
Slovak Republic	**552**	**2**	**1**	**3**	**37**	**- 369**	**224**	**2 080**
1	64	0	0	0	- 80	- 122	- 138	590
2	94	0	0	0	- 6	- 94	- 6	464
Quintile 3	128	1	0	1	8	- 70	68	403
4	136	1	1	1	34	- 52	120	364
5	129	0	0	0	81	- 32	179	259
United Kingdom	**5 003**	**843**	**1 145**	**1 988**	**- 632**	**- 4 673**	**1 696**	**27 155**
1	651	204	248	452	- 1 755	- 1 736	- 2 388	8 768
2	844	102	173	275	46	- 1 041	126	5 183
Quintile 3	1 237	133	190	323	11	- 922	652	5 289
4	1 075	216	313	529	409	- 628	1 388	4 349
5	1 195	187	221	409	658	- 345	1 919	3 565
United States	**23 567**	**na**	**na**	**7 323**	**- 3 711**	**- 19 504**	**7 676**	**130 490**
1	3 931	na	na	1 245	- 3 663	- 6 538	- 5 024	36 460
2	3 521	na	na	1 584	- 1 612	- 3 368	125	23 045
Quintile 3	5 423	na	na	1 513	309	- 4 622	2 623	30 698
4	6 262	na	na	1 474	238	- 3 207	4 767	23 788
5	4 429	na	na	1 508	1 017	- 1 769	5 185	16 499

Note: Quintiles represent in principle 20% of 2010 employment. In practice, the percentage may deviate from 20 because of the requirement that an occupation must be entirely contained with one quintile. Components of change for Germany and the United Kingdom are based on 2005-10 data, which have been "decadised" to agree with net change in the labour force observed over the 2000-10 period. See Annex 4.A1 for a description of the decomposition methodology. Some change estimates, in particular those smaller than 5000, may not be significantly different from zero.

1. Note by Turkey: The information in this chapter with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the “Cyprus issue”.

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: European countries: Labour Force Surveys, Census 2000 and American Community Survey for the United States.

Table 4.A2.2. Overqualification rates of highly educated persons according to two definitions, and classification of high-skilled occupations according to the two definitions, pooled 2006-10 data

	Overqualification rates (% of highly educated persons)			Percent of all jobs held by highly educated persons			
	Statistical criterion	Normative criterion	Difference	High-skilled, both classifications	High-skilled statistical	High-skilled normative	
					Medium-skilled normative	Medium-skilled statistical	Low-skilled statistical
Switzerland	44	23	21	50	0	27	0
Austria	49	26	23	51	0	23	0
Germany	43	23	20	54	0	23	0
Slovak Republic	46	11	35	55	0	34	0
Italy	43	16	27	56	0	28	0
Czech republic	41	8	33	58	0	33	0
Estonia	35	34	2	58	0	8	0
Turkey	35	30	5	60	0	8	0
Spain	24	38	-13	62	12	0	0
Ireland	32	37	-5	62	0	1	0
France	32	24	8	64	0	12	0
Poland	32	18	14	64	0	18	0
Belgium	26	27	-1	66	4	7	0
Hungary	33	14	19	69	0	18	0
United Kingdom	25	29	-5	70	0	1	0
Denmark	27	15	12	70	1	15	0
Slovenia	25	9	15	71	0	20	0
Sweden	27	14	13	72	0	14	0
Norway	27	13	14	72	0	15	0
Netherlands	25	15	10	72	0	13	0
Portugal	26	15	10	73	0	7	0
Greece	26	22	4	73	0	5	0
Finland	15	22	-7	76	7	2	0
Iceland	19	11	7	78	0	6	0
Luxembourg	15	4	11	84	0	12	0
Average	**31**	**20**	**11**	**66**	**1**	**14**	**0**

Note: Quintiles represent in principle 20% of 2010 employment. In practice, the percentage may deviate from 20 because of the requirement that an occupation must be entirely contained with one quintile. See Annex 4.A1 for a description of the decomposition methodology. Some of the change estimates shown, in particular those less than 5 000, may not be statistically significant from zero.

Source: European countries: Labour Force Surveys, Census 2000 and American Community Survey for the United States. See Table 4.A2.1 in the annex.

Part II. Migrant skills

Chapter 5

Immigrant skills, their measurement, use and return: A review of literature

Ana Damas de Matos
OECD

This chapter compares immigrant and native skills in OECD countries and discusses whether immigration policy is effective in attracting immigrant skills to the host countries. It reviews the academic literature on the returns to immigrant skills in terms of labour market outcomes: employment, skill mismatch and wages, and emphasizes the importance of taking into account different measures of skills as well as the country where the skills were acquired. The chapter reviews two sets of explanatory factors for the lower returns to immigrant than to native skills: on the one hand, immigrants with similar skills to natives may in reality be less productive in the host country; and on the other hand, employers may prefer to hire natives than immigrants. The conclusion puts forward key policy questions and challenges.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

5.1. Introduction

Skills are in the spotlight of policy circles in OECD countries and have been considered to be the "global currency of the 21st century" (OECD, 2012a). The evidence on coexisting high unemployment rates and skill underutilisation shows the need to develop policies which ensure a better fit of the demand and the supply of skills in the labour markets. Learning more about workers' skills and their use in the labour market is a crucial first step in this direction.

Immigrants represent 13% of the total labour force in OECD countries in 2010 and often bring skills to the host countries which are different from those of the native populations. However, overall, little is known about workers' skills and even less so about those of immigrant workers. Comparable measures of skills across countries are limited. This makes comparisons between workers across OECD countries difficult, as well as between native and immigrant workers within the same country. An additional challenge related to the skills of immigrant workers is that it may be particularly difficult for them to make use of their skills in a foreign labour market, especially when the skills were acquired abroad. This chapter reviews the academic literature on immigrant skills, their measurement, use and return in the labour market.

A better understanding of the skills immigrants bring to the host countries and how these are used in the labour markets is crucial for the design of both immigration and integration policy. Several OECD countries with ageing populations and expected labour market shortages in the short to medium term have been turning to immigration as one way to adjust their labour markets. Selecting and attracting immigrant workers with the necessary skills is hence becoming a key policy objective. Making the best use of the skills of immigrants already in the host countries also requires an in-depth understanding of the skills they bring from the home countries and how these are rewarded in the labour market. Shedding light on the type of difficulties immigrants face (whether it is poor language knowledge, the lack of recognition of diplomas, employer discrimination or other factors) would help designing better targeted integration policies.

The chapter is organised as follows. Section 5.2 compares immigrant and native skills in OECD countries and discusses whether immigration policy is effective in attracting immigrant skills to the host countries. Section 5.3 reviews the academic literature on the returns to immigrant skills in terms of labour market outcomes: employment, skill mismatch and wages. The section emphasizes the importance of taking into account different measures of skills as well as the country where the skills were acquired. Section 5.4 reviews two sets of explanatory factors for the lower returns to immigrant than to native skills: on the one hand, immigrants with similar skills to natives may in reality be less productive in the host country; and on the other hand, employers may prefer to hire natives than immigrants. Section 5.5 concludes and puts forward key policy questions and challenges.

5.2. Immigrants' educational attainment and skills

This section presents an overview of the skills immigrants bring with them to the OECD countries. Skills are here defined as the "bundle of knowledge, attributes and capacities that can be learned and that enable an individual to successfully and consistently perform an activity or task, whether broadly or narrowly conceived, and can be built upon and extended through learning" (OECD, 2012a). This broad definition encompasses concepts as diverse as the technical knowledge of an engineer or the persuasion power of a salesman. The concept of skills defined as such is similar to the

human capital concept most often used in the economics literature. The first main challenge in comparing workers' skills is to find appropriate measures of skills.

The most straightforward measure of skills is educational attainment. In most academic studies, and in particular in cross-country comparisons, the educational attainment is usually divided in three levels: less than upper-secondary education, upper-secondary and tertiary.[1] This is a rough measure of skills, of what a worker knows and can actually do. All college degrees, for instance, are considered to transform into the same skill level in the labour market independently of their quality or the field of expertise. Educational attainment is nevertheless the most widely available and used measure of skills to compare immigrants and natives in the host countries.

Another measure of skills in the literature is that of assessed skills, such as in literacy tests.[2] These test scores give a measure of how immigrants and natives perform in some specific tasks: such as extracting information from a text or a graphic, and may also be used to proxy for practical skills usable in the labour market. Differences in more general skills between immigrants and natives, and in particular non-cognitive skills, such as interpersonal skills, persistence or communication skills, have not been exploited yet but could be a fruitful area of research.

In a context of knowledge-based economies with ageing populations as in most OECD countries, attracting high-skilled immigrants has become a policy priority. The last part of this section reviews the debate on whether more selective immigration policies in terms of skills are effective in attracting skilled immigrants to the host countries.

Immigrants' educational attainment

The average educational attainment of immigrants across OECD countries is similar to the educational attainment of natives, except for a slight over-representation of immigrants at the lowest and highest educational levels. Table 5.1 shows the proportion of low-educated (less than upper secondary) and high-educated (tertiary-educated) for immigrants and natives. These numbers unveil large differences across OECD countries: in Southern Europe, half the immigrants have less than upper-secondary education, whereas this is the case for less than a quarter of immigrants in Australia, New Zealand and Canada. The United States lies somewhere in between with a third of its immigrants having less than upper-secondary education. At the other end of the educational distribution, close to half of the immigrants in Canada have some tertiary education compared to only 11% in Italy.

Part of the differences across OECD countries is related to the country of origin mix as there are large disparities in educational attainment by country of origin. For instance, 60% of immigrants from India in OECD countries have tertiary education, compared to 15% of immigrants from Mexico. Immigrants from Asia, OECD settlement countries (the United States, Canada, Australia) and some African countries are on average highly educated, whereas immigrants from South America, the Caribbean and North Africa are much less likely to have tertiary education (Figure 5.1).

There has been much discussion on the literature on the "quality" of different cohorts of immigrants entering the United States (Borjas, 1993), and Canada (Aydemir and Skuterud, 2005). Table 5.1 compares the educational attainment of recent immigrants, who have been living in the host country for ten years or less, and that of the whole immigrant population. Recent immigrants are on average more educated than longstanding immigrants. This trend may be partly correlated with a change in the origin mix of sending countries. Another factor to take into account is that educational

attainment has risen steadily in the past decades in most countries. It is hence not clear how this increase in the educational attainment of immigrants compares to the natives', as most recent immigrants are also younger on average than more established immigrants. These results remain true for immigrant women considered separately.

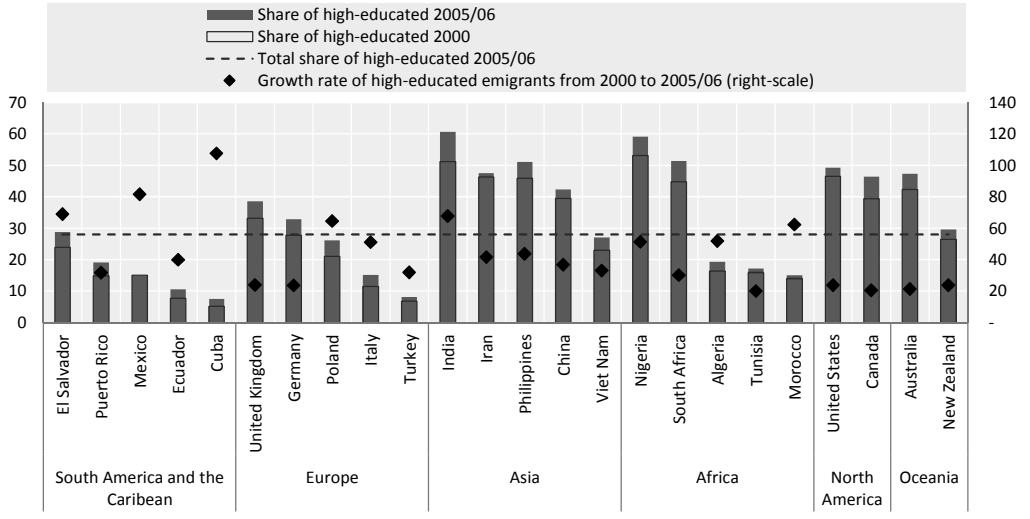
Table 5.1. Educational attainment of native-born and foreign-born aged 15 and over, by destination countries and by duration of stay

Country of residence	Native born				Foreign-born				Foreign-born up to 10 years of residence			
	Total	Women	Low-educated	High-educated	Total	Women	Low-educated	High-educated	Total	Women	Low-educated	High-educated
	(thousands)	(%)	(%)	(%)	(thousands)	(%)	(%)	(%)	(thousands)	(%)	(%)	(%)
Australia	10 584	51.4	32.4	24.1	3 500	50.4	24.8	34.5	893	51.3	12.2	48.4
Austria	5 870	51.3	25.7	14.9	1 175	53.1	33.5	17.9	369	54.7	30.6	23.3
Canada	19 540	51.2	24.6	37.5	5 800	52.2	21.3	46.9	1 600	52.5	16.9	57.1
Denmark	4 033	50.2	35.4	25.3	217	53.3	33.9	29.1	82	53.3	36.1	31.0
EU27	364 187	51.4	36.0	20.4	42 903	52.3	39.9	21.9	14 707	53.4	37.9	23.9
Finland	4 325	51.3	31.4	28.4	142	50.3	29.1	27.9	63	51.6	36.1	24.0
Germany	60 237	51.0	20.7	21.7	11 372	52.3	38.0	18.4	1 912	55.9	34.6	24.7
Greece	8 501	51.3	47.7	18.3	805	50.2	50.4	13.0	334	51.5	57.0	11.1
Ireland	2 938	51.0	37.8	27.9	477	50.9	21.6	42.1	305	49.4	19.0	43.7
Italy	47 020	51.7	55.5	11.1	4 503	54.0	48.1	11.0	2 197	56.9	49.3	10.0
Luxembourg	223	50.7	32.8	20.4	165	50.5	29.8	38.2	62	48.0	18.9	56.6
New Zealand	2 224	52.0	27.9	22.6	688	51.8	16.1	33.4	325	52.3	9.4	39.6
Norway	3 379	50.8	31.7	23.6	224	50.8	37.1	29.8	56	52.9	47.0	26.0
Poland	31 397	52.4	23.2	18.1	276	61.8	38.9	17.7	28	53.6	10.5	36.7
Portugal	8 362	52.0	74.1	11.3	659	53.5	51.7	18.3	261	55.8	50.3	12.9
Spain	32 795	51.1	56.9	24.9	5 683	50.9	47.9	20.3	3 707	52.0	48.1	18.1
Sweden	5 812	48.8	26.0	27.0	1 139	52.4	34.1	30.2	360	52.7	38.7	39.3
Switzerland	4 537	51.3	22.9	21.6	1 300	49.4	40.8	24.1	470	53.0	31.3	38.3
United Kingdom	36 547	50.1	29.2	29.2	5 974	52.1	22.1	34.6	3 029	50.7	17.8	32.9
United States	201 562	51.5	17.3	31.0	39 000	50.0	32.7	29.9	13 000	47.9	35.2	29.1

Source: The data for the European Union countries are from the Eurostat Labour Force Survey from 2010. For other countries, data come from the *Database on Immigrants in OECD Countries, DIOC 2005/06*, www.oecd.org/migration/dioc.

Figure 5.1. Share of highly-educated aged 15 and over among five main emigrant populations, by region of origin, 2005/06 and 2000

Percentages



Source: Widmaier, S and J.-C. Dumont (2011), "Are Recent Immigrants Different? A New Profile of Immigrants in the OECD Based on DIOC 2005/06", *OECD Social, Employment and Migration Working Papers*, No. 126, OECD Publishing, Paris, http://dx.doi.org/10.1787/5kg3ml17nps4-en.

A number of papers on the assimilation of immigrants make the distinction between education and skills acquired in the home versus the host country, such as for instance Clark and Lindley (2009) for the United Kingdom, Nordin (2007) for Sweden, or Bratsberg and Ragan (2002) for the United States. Upon arrival, immigrants bring their education, work experience and other skills acquired in the home country and as time goes by they also accumulate skills in the host country. A majority of immigrants in OECD countries have already completed their education upon arrival in the host country. Table 5.2 shows the percentage of immigrants who acquired their highest degree in the home country by level of education in selected OECD countries. With the exception of France, a majority of immigrants had completed their education before migration. Another exception is tertiary-educated immigrants in the United Kingdom who have also often completed their education in the host country.

Table 5.2. Percentage of the foreign-born who obtained their highest educational degree in the host country, selected European OECD countries, 2008

	High education level	Medium education level
Austria	33	30
Belgium	31	34
Spain	18	9
France	63	63
Germany	36	39
Greece	22	14
Ireland	26	20
Italy	27	25
Luxembourg	4	28
Netherlands	44	62
Portugal	46	28
Sweden	36	46
Switzerland	19	17
United Kingdom	66	39
Group average	34	32

Note: "High" education refers to ISCED 5 and above, "medium" to ISCED 3 and 4.

Source: OECD (2012), *Jobs for Immigrants (Vol. 3) – Labour Market Integration in Austria, Norway and Switzerland*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264167537-en.

Immigrants' assessed skills

Educational attainment is the classical measure of workers' skills in the labour economics literature. According to the human capital model developed by Becker (1964), individuals invest in schooling in order to acquire skills usable in the labour market and earn higher wages. Although educational attainment is the most widely available measure of workers' skills and the most frequently used, it remains an imperfect proxy for the set of skills the worker actually brings to the labour market. Formal education does not translate perfectly into skills usable in the labour market.

The International Adult Literacy Survey (IALS, 1994-98) is one of the few data sources on this type of assessed skills for adults. It covers 20 countries and measures three components of literacy: prose literacy (the individual's ability to understand and extract information from a text), document literacy (the ability to extract information from different sources: maps, tables, etc.) and quantitative literacy (the ability to apply

arithmetic operations in everyday life situations). Although schooling is likely to improve the performance on literacy tests, the correlation between literacy skills and educational performance is complex. Literacy tests do seem to measure skills not necessarily captured by educational attainment.[3]

OECD and Statistics Canada (2000) compare scores in the IALS of non-native language immigrants and natives. On average immigrants score lower than natives in the literacy tests. The difference between the two groups is higher in North America or Western Europe than in Australia or New Zealand. In Norway and Sweden, there are large numbers of immigrant non-native speakers at the lowest levels of literacy but also a large representation of immigrants at the highest levels of literacy. This over-representation of immigrants at the top and bottom of the skill distribution is also emphasized in Kahn (2004). He exploits the IALS scores for Switzerland, Canada, New Zealand and the United States, and shows that the distribution of the literacy scores is bimodal for immigrants but unimodal for natives. This result is interpreted as evidence of the existence of two distinct groups of immigrants in the host countries: high and low literacy immigrants. Furthermore, Kahn (2004) shows that although immigrants in Canada and New Zealand have on average higher educational attainment than the native-born, they have lower test scores. These results show that using literacy test scores as an additional skill measure may shed light on the difficulties in translating immigrant educational attainment into skills usable in the host country labour market.

In the past decade, an interest in non-cognitive skills has re-emerged in the labour economics literature, in the works by James J. Heckman, for instance, among others. Non-cognitive skills such as motivation, tenacity, trustworthiness and perseverance have been shown to be important predictors of the individual's success in school and in the labour market. In the mid-1970s, Bowles and Gintis (1976) had shown that grades in school are strongly correlated with perseverance and consistency and that employers value non-cognitive skills such as job stability and dependability. Leadership skills are also shown to be good predictors of wages for men, Kuhn and Weinberger (2005). No study has compared immigrant and native non-cognitive skills. These may be significantly different as immigrants come often from different cultural backgrounds than natives and non-cognitive skills are also likely to be related to the decision to migrate (which would imply that the set of non-cognitive skills on the migrant population is not a random subset of skills in the home country).

Despite some progress over recent years, little is still known on how immigrants and natives' skills differ on different dimensions. More research on a broader definition of worker skills is clearly needed: other assessed skills such as for instance computer use or more generally skills used at work other than the literacy measures available so far. Research on non-cognitive skills and to what extent immigrants are different from natives along this dimension might also prove fruitful.

Immigrant self-selection, immigration policies and immigrant skills

Understanding the differences in immigrants' educational levels and other skills across OECD countries requires understanding the twofold selection of immigrants into the host countries. On the one hand, there is immigrant self-selection: individuals decide whether to migrate and where to migrate; on the other hand, host countries restrict the extent of immigration and allow immigrants into the country according to more or less selective criteria, by setting quotas or by admitting immigrants based on skills. From a policy perspective understanding the selection of immigrants is crucial in order to assess

to which extent host countries can influence the level of skills of immigrants coming into the country by designing adequate immigration policies.

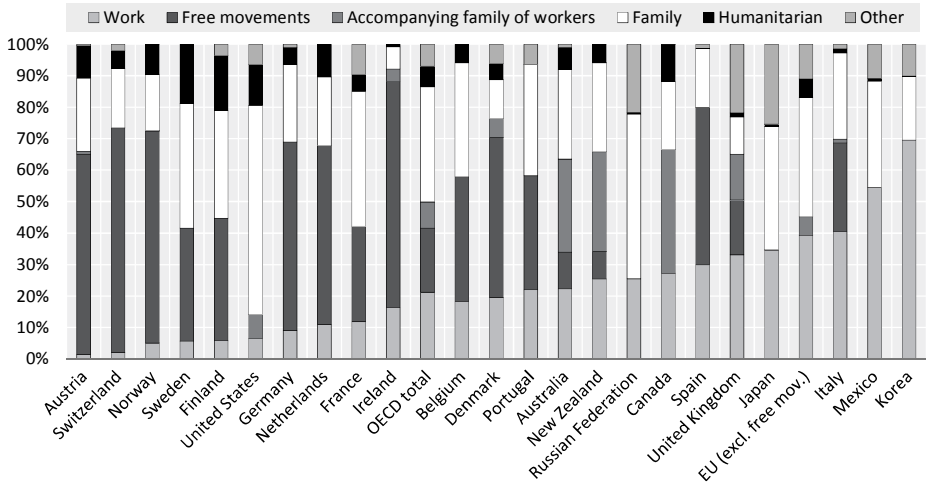
A traditional literature on the economics of migration has focused on the self-selection of immigrants and on understanding the decision to migrate, as for instance Borjas (1987) or Borjas (1999). The models in this strand of the literature are based on the Roy model according to which workers migrate to the countries where they expect the highest returns to their skills net of the migration costs. The focus is on individuals migrating for work and the data used is on observed migration flows, more than on the intentions to migrate. Difficulties in accessing the host country are also not explicitly modelled. In a recent paper, Grogger and Hanson (2011) show that the absolute difference in wages between high- and low-skilled workers in the host country accounts for a large part of the difference in relative stocks of more educated migrants across countries. Using their model to quantify the relative weight of different factors influencing the migration decision (language, distance, migration costs, policy environment, etc.), they suggest that skill-related wage differences are the main factor that explains why the United States and Canada receive more skilled immigrants than other OECD countries.[4]

According to this literature, the host country's power to attract skilled migrants depends on the performance of its labour market. Immigration and integration policies may also influence (at least at the margin) the selection of immigrants. Variables such as the rights given to immigrants, the long-term or short-term availability of work permits are also factors likely to influence the skill mix of immigrants applying to work and live in the host country remains extremely scarce. Evidence on the effect of such policies on the skill composition of immigrants. The literature has mainly focused on the direct immigration policy mechanisms that countries use to influence the skill levels of admitted immigrants, by, for instance, setting quotas for different visa types or by giving preference to immigrants applying to work in the country based on skills.

An important distinction when analysing immigrant skills is to separate immigrants by the reason for migration: work, family, or humanitarian reasons. This distinction is rarely made in academic work (mainly for lack of data on the reason of migration and/or visa status) but is very relevant in terms of policy. Only a fraction of immigrants in the OECD countries are labour migrants, that is immigrants whose main reason to migrate is work. According to OECD (2012a), 36% of permanent migration flows to OECD countries were family related in 2010 and 21% were work related (approximately 40% when considering both work and free movement flows). Canada, New Zealand and Australia are countries with high shares of labour migrants and accompanying families. Humanitarian migration is more common in the European countries of the OECD. In Europe free circulation accounts for a large part of work-related migration. In Switzerland, for instance, free movement migration accounts for 71% of permanent-type migration (Figure 5.2).

Figure 5.2. Permanent inflows into selected OECD and non-OECD countries, total and by category of entry, 2010

Percentage of total population



Source: OECD (2012), *OECD International Migration Outlook 2012*, OECD Publishing, Paris, http://dx.doi.org/10.1787/migr_outlook-2012-en.

Labour migration is one of the only areas where policy can influence directly the composition of migration flows by education level. There are many different policies in place across OECD countries that accept labour migrants based on skills.[5] A major question in the literature has been whether more selective immigration policies in terms of skills are effective in attracting more skilled immigrants. An important part of the literature compares the United States and Canada, which have similar economies but while most immigrants coming to the United States, are family migrants, immigrants to Canada are subject to a selective skill point-based immigration system. Duleep and Regets (1992) and Borjas (1993) compare the two countries and show that immigrants in Canada have higher educational levels and this is mainly due to the different mix of countries of origin in the two host countries, and not because they attract immigrants with different education levels from the same countries of origin. On the same line of research, Antecol et. al (2003) present evidence that the main reason why immigrants in the United States have lower levels of education and lower English fluency than immigrants in Canada and Australia is geography, and in particular the fact that US immigrants come from Latin America. The implication from these findings is that the impact of immigration policies in attracting the desired type of skills may be limited when compared to geographical and historical determinants.

Nevertheless, there is also some evidence that even within the same country of origin, immigrants admitted for work are more educated and have higher language skills than immigrants admitted for family reasons in the United States (Jasso and Rosenzweig, 1995), Canada (Aydemir, 2011), and Australia (Cobb-Clark, 2000). Kahn (2004) comparing Canada, New Zealand, the United States and Switzerland shows that the literacy test scores are lower for immigrants in the United States than in the other countries and the bimodal distribution of immigrant scores is also more prominent. He interprets these findings as consistent with the expected impacts of the differences in immigration policies.

Overall, there is evidence that countries with more selective entry policies based on skills do have immigrants who are more skilled upon arrival; the extent to which the relationship is causal is still subject to debate.[6] The definition of selective migration policies in academic studies is often narrowly defined. More or less explicitly, every country selects. Governments may delegate this right to employers, while imposing certain constraints, such as minimum educational attainment or earnings. Furthermore, one should not forget that a large share of immigrants in OECD countries are not directly selected since they migrate for family reasons, under free movement agreements or for humanitarian reasons.

5.3. Returns to education and skills in the host country labour market

The section above reviews the evidence available on the stock of immigrant skills in OECD countries. This section reviews the literature on immigrant labour market outcomes upon arrival and over time in OECD countries and the evidence on the extent to which immigrant education and skills are used and rewarded in the host countries. The focus is on three different outcomes: access to employment (labour force participation and employment rates), overqualification and wages. Depending on the host country's labour market and migrant population, the main challenge for the integration of immigrants may be participation, employment, wages or overeducation. The main gap in outcomes between immigrants and natives in Sweden, for example, is the one in employment rates. The main challenge is for immigrants to find jobs; once employed, the observed wage gaps tend to be small since the distribution of wages in the labour market is very compressed. By contrast, Portugal or the United Kingdom have higher employment rates for immigrant men than for natives (OECD, 2012a), and the main challenges in these economies are linked to immigrant overqualification and the immigrant-native wage gap.

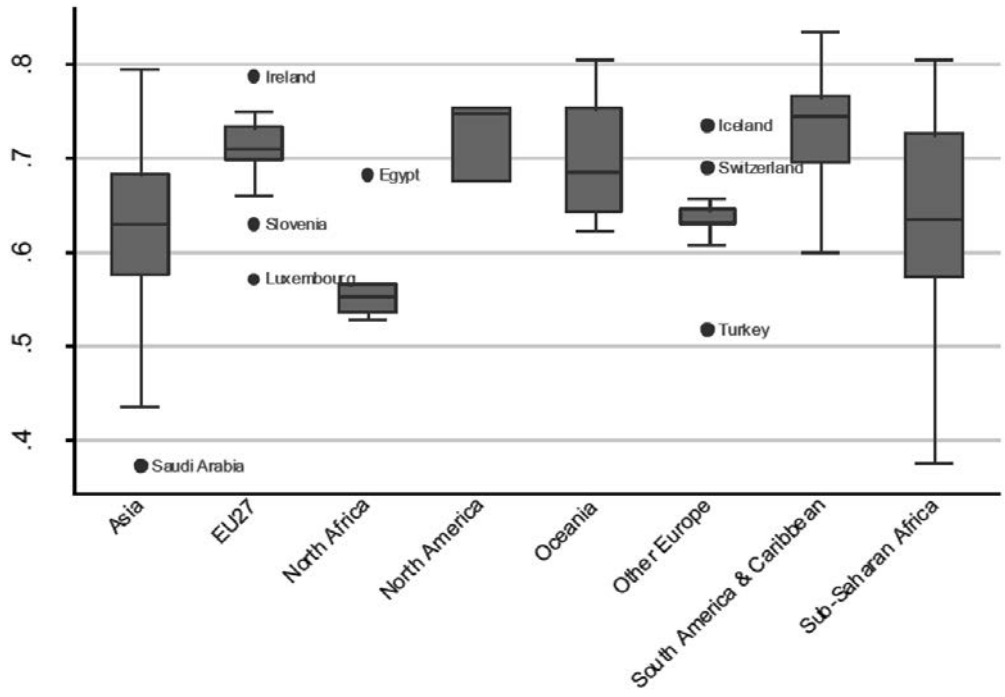
The labour market outcomes of immigrants

Labour force participation and employment rates

On average over OECD countries in 2005-06, 68% of immigrants aged 15-64 were employed and the unemployment rate was 9%. These numbers are similar for natives but there are large disparities in employment outcomes by immigrant country of origin. The employment rates are significantly higher for immigrants from the United States and the European Union (more than 70%) than for immigrants from North Africa (less than 60%). The differences in employment rates between immigrants and natives are larger among the more educated workers than among the less educated.

The labour force participation and employment rates for immigrant women are also lower than those of the native-born women even after accounting for differences in educational attainment. Nevertheless, migrant women's labour force participation is on average higher than that of non-migrant women from the same origin country (Figure 5.3).

Figure 5.3. Dispersion of employment-to-population ratios of foreign-born 15-64, by region of origin in OECD, 2005/06



Source: Widmaier, S and J.-C. Dumont (2011), "Are Recent Immigrants Different? A New Profile of Immigrants in the OECD Based on DIOC 2005/06", *OECD Social, Employment and Migration Working Papers*, No. 126, OECD Publishing, Paris, http://dx.doi.org/10.1787/5kg3ml17nps4-en.

These basic stylised facts are confirmed for individual countries by the academic literature focusing most often on one host country at a time. Several papers, among which Chiswick (1982) for the United States and Price (2001) for the United Kingdom, show that the individual characteristics of immigrants explain part of the differences in employment rates. Immigrants with higher levels of education and more work experience, have higher employment rates, but still fall short of the native employment rate. These results indicate that nominally equivalent educational achievement and work experience (the most often available measures of skills) do not necessarily grant the same access to employment to immigrants than they do to natives.

Overqualification

For immigrants employed in the host countries, a concern which has been drawing increasing attention is overqualification. This new literature focuses on understanding to which degree immigrants work in occupations that match their skill levels. The main measure of skills used in this literature is educational attainment. There are three main measures of overeducation that compare the worker's educational attainment to his occupation: a normative, a statistical and a subjective measure. The normative measure uses an a priori correspondence between education and job qualification; the statistical measure uses the mean or median educational level for a given occupation in the native population as the norm and compares the worker's educational attainment to this norm; the subjective approach uses the worker's perception of the skills he uses at work to determine whether there is skill underutilisation.

The most widely used measure of overeducation in analysing immigrant outcomes is the statistical measure and the papers usually compare the prevalence of overeducation of migrants to that of the natives'. The results for practically all countries point to the same stylised fact: immigrants are on average more overeducated than natives, and hence receive lower returns to their education in terms of occupational attainment than natives.

There is significant heterogeneity in the overeducation rates by host country and migrant country of origin, as it is the case in migrant's access to employment. Dumont and Monso (2007) show for OECD countries that the host country labour market structure partly explains the extent of overeducation (in Italy, for instance, the unemployment rate of immigrants is low but their overeducation rate is high). Nevertheless, migrants' individual characteristics remain the most important explanatory factor. Dumont and Monso (2007) find that migrant women are more often overeducated than migrant men; immigrants from non-OECD countries and more recent immigrants also suffer a larger overeducation penalty. These main stylised facts are confirmed for European countries in Cedefop (2011), and also in some studies for individual countries as for instance, Poot and Stillman (2010) for New Zealand or Sanroma et al. (2008) for Spain.[7]

Wages

Traditionally, the literature on the outcomes of immigrants in the host country labour market has focused on wages. The main stylised fact that emerges from this literature is that there is an immigrant-native wage gap: immigrants earn on average less than natives. The framework for these estimations is an earnings equation, Mincer (1974). Earnings are expressed as a function of potential experience in the labour market (the time since the individual left full time education), the years of education, and other characteristics depending on the data used.

Although there are many studies on immigrant wages for individual countries, it is difficult to have comparable data for OECD countries. OECD (2008) presents a first analysis of wage differentials between immigrants and natives in nine countries. The stylised facts coming from this analysis are that immigrants earn less than comparable natives (natives of the same age, gender, educational attainment) in all countries except Australia; and the wage gap is higher for immigrants coming from non-OECD countries. Years of education and work experience do not grant immigrants access to the same levels of wages as they do for natives.

The returns to education and experience with time spent in the host country

An important question in the literature is whether the returns to education and experience increase with years in the host country labour market. Most academic studies have focused on the wage catch up, in understanding to which extent the wages of immigrants converge to the wages of similar natives. However, there is also some literature on the changes in employment and overeducation rates over time. Documenting whether the penalty immigrants suffer in the host country labour market upon arrival is transitory and decreases with time spent in the host country is a first step towards understanding the factors that explain the lower returns to skills for immigrants.

Employment and unemployment rates

Several papers have studied the evolution of the employment and unemployment rates for immigrants with time spent in the host country to test whether the immigrants' rates converge to those of natives as first documented by Chiswick (1982). Bevelander and

Nielsen (2001) compare the employment rates of non-refugee immigrants in Sweden from the former Yugoslavia and Nordic countries over time. The employment rate for natives is approximately 88%, whereas it is on average 20 percentage points lower for immigrants from the former Yugoslavia and 12 percentage points lower for immigrants from other Nordic countries. They estimate that after ten years of residence, immigrants from Nordic countries close the employment gap but that even after 20 years of residence there is no sign of convergence for immigrants from the former Yugoslavia.

Husted et al. (2001) show that the employment rates of immigrants in Denmark are also low, especially for refugees. Employment is in this case the main challenge for immigrants' labour market integration and there are no signs of convergence. Amuedo-Dorantes and De la Rica (2007) show in the case of Spain that there is strong assimilation in terms of employment but only for some origin groups. For immigrants from Europe outside of the EU15 and immigrants from Latin America, they estimate close to full convergence to the native employment rate after five years of residence, but there is no evidence of convergence for immigrants from Africa. The data used in all the studies above is cross-sectional and hence confounds cohort and years-of-residence effects. The analysis is also most likely contaminated by out-migration selection bias.[8] An exception to these cross-sectional studies is a set of papers using a longitudinal survey tracking immigrants in the first years in Australia, the Longitudinal Survey of Immigrants in Australia (LSIA). The LSIA has three waves: one once the immigrant has been in the country for six months, one after one year, and one after three years. Cobb-Clark (2000) shows that the employment rates change over time and in particular that the employment rates of migrants who were not selected for their skills increase over time and become closer to the employment rates of immigrants from the Business Skills and Employer Nomination Scheme programmes.

Overqualification

There are several reasons why immigrants would be working in jobs for which they are overeducated upon arrival: lack of human capital specific to the host country, as for instance the language; the immediate need of a source of income and after some time in the host country the need to fulfil the criterion of being in employment to renew the permit of residence; the lack of knowledge about the host country labour market and institutions which would make the job search less efficient, etc. In fact, overqualification of immigrants is found to be decreasing over time in OECD countries (Dumont and Monso, 2007), European countries (Huber et al., 2010), New Zealand (Poot and Stillmand, 2010), Australia (Piracha et al., 2011), Canada (Green, 1999). On the other hand, Fernandez and Ortega (2007) do not find evidence of lower rates of overeducation of immigrants over time in the Spanish context. The evidence in these papers is based on cross-sectional data and is again plagued with the United Statesual selection bias concerns. Chiswick et al. (2003) use the LSIA and find that the overeducation rate of immigrant men decreases over time. The authors also have information on the occupation in the home country and document, first, a decrease in the occupational attainment upon arrival in the host country, followed by an improvement with years of residence. Green (1999) also shows, using panel data, that over time the distribution of occupations among immigrant men becomes more similar to the one in the stated intentions upon arrival in Canada.

Wages

Since Chiskwick (1978), the literature on the assimilation of immigrants has studied how the wage gap changes with years of residence in the host country. This original study considers only immigrant men who declare positive annual earnings in the census data from wages, salary or self-employment. The main question in this literature is whether the wages of immigrants can be expected to converge to the wages of natives with similar characteristics with time spent in the host country. Using cross-sectional data to compare immigrants at different years of residence in the host country may be misleading if the immigrants who remain in the host country are a selected group. The initial Chiswick (1978) estimation that immigrant wages in the United States would overtake the natives' in 10 to 15 years of residence has been shown to be much too optimistic. After many years of debate (Borjas, 1985 and 1995), the careful use of panel data has shown that there is some immigrant wage catch up. Libotsky (2007) shows for the United States that there is wage catch up at a rate of 10 to 15 percentage points in 20 years. Similar studies have been conducted for instance for Canada (Hum and Simpson, 2000); and for Spain (Izquierdo et al., 2009) with mixed results.

The importance of distinguishing between education and experience acquired in the home versus the host country and taking other skills into account

Home versus host country education and experience

An important factor that is recurrent in the literature on the returns to immigrant skills in OECD countries is the distinction between skills acquired in the host country and skills acquired in the home country. A significant part of immigrants' low returns to skills in the labour market is related to a low reward of education and work experience acquired abroad.[9]

Friedberg (2000) is the first paper to distinguish directly in the data between education and work experience acquired in the host country and acquired abroad. Using Israel census data, she shows that the low returns to education and experience acquired abroad account for the full wage gap observed between immigrants and natives. Also for Israel, Cohen-Goldner and Eckstein (2008) show that there are almost no returns to education and work experience acquired abroad for immigrants from the Soviet Union in terms of earnings. However, they find positive returns in terms of having a higher probability of gaining access to a white collar job. Ferrer and Riddell (2008) show also for Canadian immigrants that returns to foreign education and schooling are lower than the returns to Canadian years of schooling and education.

The finding that immigrants who acquire their human capital in the host country have higher returns to skills than immigrants who acquire their human capital abroad has been confirmed for other labour market outcomes in different contexts and countries. Nordin (2007) shows for Sweden that immigrants with degrees acquired out of Sweden have a lower probability of finding employment. Price (1999) finds similar disadvantages for non-white immigrants in the United Kingdom. Dumont and Monso (2007) show for OECD countries that immigrants with foreign education have higher rates of overeducation. The results are similar when using different data and different measures for European countries (Aleksynska and Trithah, 2011). Nielsen (2011) also shows in the case of Denmark that the prevalence of overeducation of immigrants is lower if the schooling degree is from the host country.

Taking into account assessed skills

A relevant issue is to understand to which extent the wage gap may be linked to a mismeasurement of skills valued in the labour market. The only measure of skills available in empirical studies is most often some measure of schooling: the educational attainment or the years of schooling, and the years of labour market experience. It is very likely that these measures reflect only partly the skills rewarded in the labour market. A strand of the literature has added literacy test scores as an additional measure of skills when analysing immigrants labour market outcomes.

Kahn (2004), using data for Canada, New Zealand, Switzerland and the United States, estimates employment rates for immigrants and natives which take into account differences in test scores in the IALS. The results show that the immigrant employment rates fall short of the native rate even when considering individuals with the same age and the same number of years of education. Taking into account differences in the IALS test scores decreases the employment gap for immigrant men in Canada, New Zealand and the United States, showing that skills not captured by educational attainment are also important explanatory factors of the employment rates. This result indicates that part of the observed employment gap between immigrants and natives may in fact be due to differences in usable skills in the host country labour market which are often unobserved in standard statistical analysis of immigrant labour market outcomes. For immigrant women in these countries, once educational attainment and test scores have been accounted for, there is no employment gap left.

Dumont and Monso (2007) introduce the IALS test scores in the overeducation literature for immigrants and show that approximately a third of the gap in overeducation between immigrants and natives is due to immigrants lower test scores. Low language skills are also shown to be correlated with higher overeducation rates for immigrants. Green (1999) shows for Canada that immigrant men with low language skills have higher occupational mismatch rates than immigrants who are fluent. Immigrants from English speaking countries have lower mismatch rates in Australia than immigrants from other regions (Green et al., 2007) and in New Zealand (Poot and Stillman, 2010).

The IALS test scores also explain part of the native immigrant wage gap for Canada. Ferrer et al. (2006) show that accounting for differences in literacy skills decreases the gap by approximately a third. A large part of the difference in outcomes between immigrants and natives is hence due to differences in skills that most studies fail to take into account.

Differences in returns to immigrant skills by the reason to migrate

Even in countries where a large proportion of immigrants are given residence based on skill criteria, immigrants experience lower returns to education and experience than natives. This is the case for Canada for instance as documented above. A question the literature has addressed is whether immigrants accepted in the host countries through a skill selective system perform better upon arrival in the labour market than immigrants accepted for non-work related reasons and how their relative performance changes over time.

There is mixed evidence on whether immigrants accepted in the country under skill criteria perform better than immigrants accepted for family or humanitarian reasons, given their educational background and previous labour market experience. Aydemir (2011) uses a longitudinal survey that tracks immigrants for two years after arrival, the Longitudinal Survey of Immigrants to Canada (LSIC), to show that the principal applicants for work reasons, whose skills are evaluated through the points

system, have similar labour force participation and lower employment rates upon arrival than immigrants coming to the country as family dependents.[10] The mean wages are nevertheless higher for labour migrants.[11]

The results are somewhat different for Australia. Cobb-Clark (2006) shows that work migrants have higher labour force participation and employment rates and that the change in policy in the late 1990s in the country led to better outcomes (in labour force participation and employment) through recruiting more skilled workers. Comparing the labour market outcomes of skill-based immigrants in Canada and Australia, Hawthorne (2006) shows further that the outcomes of immigrants in Australia increased relatively to those of immigrants in Canada following the changes in the immigrant selection criteria.

An interesting fact to push the analysis further is that, in the Canadian case, immigrants accepted under the skills selection criteria earn more than other immigrants but observable characteristics, including language proficiency, account only for 40% of the differences observed. This result implies that the differences in labour market outcomes between different types of immigrants are mainly due to different unobservables (De Silva, 1997).

In the same direction, Aydemir (2011) using the LSIC shows that there are little or no returns in the first two years to skills evaluated in the skill based system: experience, education, and language. Some care must be taken in interpreting this result as the time span of the survey is short, only two years, and the results only hold for men. It would be relevant for policy purposes to understand better these first years in the careers of immigrant men and to follow their situation five or ten years after migration.

Finally, there is also some evidence of convergence of labour market outcomes across immigration entry status over time. Duleep and Regets (1996) show for the United States that there is an inverse relationship between initial earnings and earnings growth, and in particular that the earnings of family migrants are initially lower but grow faster than the earnings of labour migrants. Many green card labour migrants have already been working in the country for a number of years (e.g. as H1B's) prior to receiving their green cards. It would be interesting to know whether this is partly driving the results observed. Jasso and Rosenzweig (1995) show that there is also more occupational mobility for family migrants than for work migrants.

This line of research is relevant in terms of policy implications as it shows that it is not clear in the long run if selective visa policies are effective in terms of outcomes. There is still a large scope for research on this topic. For a complete literature review on skill based immigration selection, please refer to Aydemir (2012).

5.4. Explanations for the differences in returns to immigrant and native skills

The main stylised fact about the differences in returns to skills between immigrants and natives highlighted above is that immigrants have lower returns to education and labour market experience than natives and in particular lower returns to human capital and experience accumulated abroad. This section reviews the literature on the possible causes to this difference in returns. Two broad categories of explanations are considered: the imperfect transferability of skills between the home and the host country that is all factors that explain why immigrants with comparable skills to natives may in fact be less productive in the host country; and the reasons which may lead employers to hire natives instead of equally productive immigrants.

Differences in productivity between immigrants and natives in the host countries

A first explanation for the lower returns to the education of immigrants may be linked to the difficulties of using the knowledge acquired in the home country in the host country. This difficulty may come from the foreign diploma not being recognised in the host country and consequently immigrants cannot access the jobs they are qualified for in regulated professions. It may also stem from the fact that some degrees are country specific and the knowledge acquired in the home country is useless in the host country. The main example of this latter case is a law degree. Other less obvious examples may be those of a foreign-trained civil engineer who would have to learn cold-weather construction before being able to work in Canada; or an accountant from a less developed country confronted to the specificities of OECD accounting standards. Not being able to use the knowledge acquired through formal education in the home country leads to lower returns to education and experience acquired abroad as well as possibly overeducation. This is an issue that is less developed in the academic literature but which is very relevant in terms of policy.

As discussed in the previous section, the returns to education and experience acquired abroad are lower than to education and experience acquired in the host country. One of the reasons put forward to explain this stylised fact is the heterogeneity in the quality of the educational system in the home countries. Often immigrants' performance in the labour market is compared to that of natives with similar characteristics, and in particular the same level of educational attainment, measured as years of schooling or divided in three levels: less than upper secondary, upper secondary and tertiary education. This measure is fairly imprecise as it considers for instance that all college degrees are equivalent, independently of where they were acquired. Bratsberg and Terrell (2002) use census data for 1980 and 1990 to estimate the returns to education in the United States labour market for immigrants from more than 60 countries of origin. They find that the returns to education are highly correlated to measures of schooling quality in the home country: the pupil-teacher ratio and the expenditure per pupil.[12] Sweetman (2004) uses data for Canada to study the same issue but uses a rather different measure of schooling quality: instead of input measures, he uses maths and science average test scores in international standardised tests as a school quality index.[13] Sweetman finds also that immigrants from countries with lower quality average educational test scores receive lower returns to schooling. The heterogeneity in school quality impacts all portions of the educational distribution and has a significant impact in terms of wages. For instance, a jump from the 25th percentile to the 75th percentile in the school quality index is estimated to correspond to a 10% increase in annual earnings for immigrants with 16 years of schooling, controlling for other factors.

Taking into account differences in literacy tests between immigrants and natives allows to better understand the differences in returns to foreign and host country education. Bonikowska et al. (2008) use the Canadian component of the Adult Literacy and Skills Survey (ALL, 2003) to compare immigrant and native test scores. The ALL survey is similar to the IALS, it measures the individual's performance in four specific skills: prose and document literacy, numeracy and problem-solving. They show that immigrants who have foreign education have lower test scores than immigrants who completed their education in Canada. This paper provides direct evidence that schooling in the home country produces lower skills usable in the Canadian labour market. Furthermore, the authors introduce separate returns to foreign education and experience and the test scores in the wage gap estimations. They show that the returns to the tests

scores are the same for immigrants and natives and that introducing the test scores changes the returns to foreign education. These results show that the reason why there are low returns to foreign education is mainly because the latter translates into lower literacy skills. Interestingly, introducing literacy test scores does not change the returns to foreign experience. The low returns to foreign experience seem thus unrelated to assessed skills as measured by the ALL survey.

In the United States case the results are different. Bratsberg and Ragan (2002) find also that the return to the education immigrants acquire abroad is lower than the return to education acquired in the United States They use the score in the Armed Forces Qualification Test (AFQT), which is available in a panel data for the United States, the National Longitudinal Survey of Youth (NLSY). The AFQT is similar to a literacy test as the IALS or the ALL and is divided into different parts examining specific skills: word knowledge, paragraph comprehension, arithmetic reasoning and math knowledge. Differently from the results for Canada, taking into account the score in the AFQT in the wage gap estimation does not change the returns to foreign schooling (acquired in either the home or the host country).

Differences in quality of schooling are one possible explanation to the low returns to immigrant education and in particular to the low returns to education acquired in the home countries, as most host countries studied in the literature perform relatively well in terms of quality of the educational system. One can easily imagine that the quality of the labour market experience is also different depending on which country it was acquired in. It is however less straightforward to come up with measures of quality of work experience for different countries. Thinking of measures of country-industry productivity may be a fruitful direction towards understanding why a year of experience in certain countries may be more productive than in others.

Another potential explanation for the low returns to education and foreign experience often studied in the literature is the lack of host country language skills. This is probably one of the most studied factors of immigrant performance in the host country labour market. Many academic papers have studied the impact of language in different host countries: the United States (Chiswick, 1991; or Carliner, 1996), the United Kingdom (Dustmann and Fabbri, 2003), Israel (Berman et al., 2003), Germany (Dustmann and Van Soest, 2001), among others. The main stylised fact that emerges from these studies is that immigrants with higher host country language fluency have substantially higher earnings. Some papers analyse other labour market outcomes on top of earnings. Dustmann and Fabbri (2003), for instance, show that language fluency also has a strong positive impact on the employment rates of immigrants. This result holds controlling for the migrants' country of origin and individual characteristics such as age, educational attainment, years of residence in the host country, etc. Most of the studies are based on cross-sectional data and are contaminated by the workers' unobserved ability, which influences both language fluency and earnings. Several papers, as Dustmann and Fabbri (2003) or Bleakeley and Chin (2004), suggest instrumental strategies to deal with the endogeneity concern and find similar results.

Bonikowska et al. (2008) show using the IALS that part of the immigrant low performance in the literacy tests is due to a non-negligible proportion of immigrants being unable to complete any of the exercises because of language difficulties. This result shows that language difficulties translate into lower de facto literacy skills in the host country labour market. It remains unclear to what extent the remaining gap in scores is also linked to language difficulties and in particular the degree to which differences in

test scores between home and host country educated immigrants documented above is driven by differences in language fluency.

Bermane et al. (2003) use a survey of immigrants from the former Soviet Union to Israel to analyse the changes in host country language fluency and how they relate to the wage growth in the first years in Israel. They focus on two high-skilled occupations, programmers and technicians, and two low skilled occupations, construction workers and gas station attendants. Workers in low-skilled occupations experience no significant wage growth and no returns to Hebrew fluency. Programmers and technicians experience high wage growth relative to natives in the first years in Israel and two-thirds to three quarters of the wage growth is correlated with increases in language fluency. This paper shows that it is important to take into account the complementarities between language and the skill level of the occupation when analysing of the benefits of host country language fluency for immigrants. It does not seem to be the case that increased language skills automatically lead to better labour market outcomes.

As mentioned in the first section, we know little on broader skills of immigrants compared to natives. The educational attainment measures usually used in the literature may be correlated with different skills for immigrants and natives that have an "independent" reward in the labour market. It is difficult to distinguish low returns to observable skills from differences in unobservable skills. The unobservable skills may be of very different types. Bevelander (2001), for instance, analyses the outcomes of different cohorts of immigrants in Denmark and argues that the decline in the relative performance of immigrants from the 1970s until the 1990s is partly due to the structural shift in the Danish economy. In particular, he argues that a service information economy requires different skills, language, communication, computer use, than the more industrialised Danish economy of the 1970s. If these are skills that immigrants have less of, then it may explain the decline in outcomes partly. A similar explanation for declining labour market performance of immigrants in Sweden and Denmark between 1985 and 1995 is presented in Rosholm et al. (2006) although the labour market context of the two countries was significantly different. Another type of skills rewarded in the labour market is "soft" or non-cognitive skills. If these skills are correlated, but not perfectly correlated, to the United States usually observed skills, education and experience, then the estimates of the returns to skills for immigrants and natives are biased: what seem like different returns to skills are in reality due to differences in unobserved skills.

All the explanatory factors of the differences in returns to skills between immigrants and natives mentioned above rely on a human capital theoretical framework. Labour markets are competitive and wages equal the workers labour productivity. Most of the literature on the integration of immigrants ignores non-competitive models where employers play a role in the labour markets and wages do not depend only on the workers' productivity.

Immigrant labour demand: the hiring side

One possible explanation for immigrants' lower returns to human capital is that employers discriminate against immigrants. Recent papers have made progress on identifying discrimination but it remains difficult to know which type of discrimination is most prevalent in the labour market: statistical or taste based. Taste based discrimination translates into employers being willing to pay a cost not to employ immigrants. The decision of employers is purely based on a preference for a group and is unrelated to productivity concerns. If employers statistically discriminate against immigrants, they are

using the immigrant status to proxy for unobservable skills which would be correlated with lower productivity. Different strands of the literature attempt to identify discrimination. The first part of this section will review papers that aim at identifying the effect of naturalisations and name changes on the labour market outcomes of immigrants; the second part will review papers on correspondence testing aiming at employer discrimination towards immigrants.

Acquiring the nationality of the host country or changing a foreign surname into a host country surname does not in principle have an effect on the worker's productivity. If workers who do so gain access to better labour market outcomes, higher employment rates and higher wages, then this may be interpreted as evidence of employer discrimination. Employers hire and promote native workers preferentially. The main challenge in these papers is to identify a causal effect. If better outcomes of immigrants after naturalisation or a name change are driven by simultaneously more investment in host country specific human capital, for instance, then these cannot be attributed to employer discrimination.

Bratsberg et al. (2002) use longitudinal data for the United States, the NLSY, to track immigrant men who acquire the American citizenship in the period covered by the data 1979-91. They show that naturalisation gives access to better jobs (unionised, white collar and public sector jobs) and higher wage growth. They do not find an increase in the mean wage level just after naturalisation but the wage growth accelerates after naturalisation. This is the first study to go beyond estimations with cross-sectional data that show that immigrants who acquire the host country citizenship perform on average better than immigrants who do not. Using panel data, the authors are able to control for unobserved worker productivity and also take into account the timing of the naturalisation. The gains are particularly high for immigrants from less developed countries.

These results are not confirmed in all contexts in the literature. Bratsberg and Raaum (2011) study the same issue for Norway and find no labour market impact of naturalisation for immigrants and no impact either on wage growth or on employment rates. The paper also uses panel data and estimates the returns to years of residence in the host country for immigrants who acquire the nationality and for those who do not. They find that immigrants who eventually acquire the nationality have higher wage growth in the host country. However, contrarily to the paper on the United States above, the timing of the naturalisation does not have an impact on the labour market performance.

Other studies on the labour market impact of immigrant naturalisation differ in the exact population studied and on how they address the endogeneity concerns. For different country studies and a broader perspective on the impacts of naturalisation, please refer to OECD (2011).

Another angle to study discrimination is to analyse the change in labour market outcomes of immigrants who change their foreign names into host country sounding names. Arai and Thoursie (2009) use panel data for Sweden and focus their analysis on immigrants who change names at some point and hence identify the effect of changing names from the timing of the change. They show that after immigrants change their names into host country sounding names they experience higher wage growth and also higher employment levels. As in the naturalisation study for the United States above, immigrants who have the worse labour market outcomes, have the higher benefits from changing names. In the Swedish case, these are immigrants from Africa, Asia and Slavic countries. The magnitude of the effect is very large with labour earnings increasing by 140% after a name change. This number represents a total effect of name change which

includes also access to employment that is the change from zero to positive earnings. The probability of being in employment increases by more than 8 percentage points.

The academic papers on the effects of naturalisation and name changes focus on a convincing identification strategy of the causal effect. This is a challenging task and not much attention has been given to the mechanisms driving the identified effects yet. If the effect of naturalisation or a name change is indeed a causal effect, then the results point to some form of discrimination, in a broad sense, as it indicates that employers prefer to employ and promote workers who are native-born.

Correspondence testing papers address more directly the employers' hiring decisions, and in particular the decision to call back a job applicant. The papers in this line of research follow more or less closely the paper by Bertrand and Mullainathan (2004). In this paper, the authors randomise black-sounding and white-sounding names to equivalent quality CVs and reply to job ads in the Boston and Chicago areas. Differences in call back rates between the two types of CVs may be interpreted as discrimination, since the name is by design the only element that is different among same quality CVs.

Correspondence testing papers targeting immigrant populations differ on the information that is randomised in the CVs: the ethnicity of the name, the citizenship, the country where the education or experience was acquired. A first group of papers randomises only the ethnicity of the name. The CVs are similar in all aspects, including the education and experience which is acquired in the host country. All papers find that CVs with ethnic minority names have lower call back rates than CVs with native names. The magnitudes of the effect differ significantly depending on the study: Carlsson and Rooth (2007) find a call back rate for males with a Swedish sounding name that is 50% higher than for men with a Middle-Eastern sounding name in the Stockholm and Gothenburg areas; Oreopoulos (2009) estimates a call back rate three times higher if the applicant has an English sounding name compared to a Chinese, Indian or Pakistani[14] name in the Toronto area; and Duguet et al. (2010) estimate a call back rate five times higher for French sounding names compared to workers with a Moroccan name in the Paris area.

In order to learn more about the origins of the discrimination from these experiments, several of these studies analyse differences in call back rates depending on the characteristics of the job and the employer. Both Oreopoulos (2009) for the Toronto area and McGinnity and Lunn (2011) for the Dublin area find that the difference between natives and immigrants in call back rates is independent of the job applied for, and in particular in the Toronto experiment case, independent of the social and language skills required for the job. Carlsson and Rooth (2007) find that in Sweden the call back rates differ by occupation, and that in particular the call back rates are lower for foreigners in teaching jobs compared to shop assistants, for instance. More evidence on whether the discrimination observed depends on the type of occupation would be valuable to better understand the reasons that lead employers to prefer hiring natives to immigrants.

Employers' characteristics have also been exploited in recent studies. Carlsson and Rooth (2007) show that there are bigger differences in call back rates between Swedish and Middle-Eastern named applicants from small firms than from big firms. However characteristics such as the percentage of foreign-born in the workforce, the ethnicity of the recruiter, or whether the firm has a personnel department are uncorrelated with the difference in call back rates in their sample. In a more recent paper, Rooth (2010) shows however that the probability to call back a job applicant with an Arab-Muslim sounding name is negatively correlated with the employer's negative implicit association towards

Muslim men. This result indicates that part of the discrimination may come from subconscious processes affecting decisions which are made quickly.

Two recent papers also randomise the country where the education was acquired to detect to which extent employers prefer host country qualifications. Carlsson and Rooth (2008) show that whether the education was acquired abroad or in the host country explains 23% of the differences in call back rates. In the context of the correspondence testing experiments, this result may be interpreted as a lower bound for statistical discrimination. The difference in call back rates between immigrants educated in Sweden and abroad may not be attributed to taste based discrimination. The 77% unexplained share of the gap in call-back rates may be either due to taste based or statistical discrimination.

Oreopoulos (2009) goes one step further in this literature and shows using the experiment in Toronto that firstly the quality of the foreign diploma does not matter. Immigrants who graduated from top foreign universities have call back rates as low as if they graduated from any other foreign institution; secondly, for immigrants with four to six years of experience in Canada, the discrimination against foreign schooling disappears. These results are consistent with a model of the labour market where education and experience act as signalling devices of the worker's productivity to employers. In this model, employers may find it harder to judge foreign education and experience and may hence discount them heavily and more so if they are risk averse. If this were to be the case, then one would expect that employers who have hired immigrants in the past behave differently than employers who have not. Furthermore, there should be less uncertainty about the qualifications of immigrants from more established communities than about those from recent immigration waves. Finally, there is also evidence for Canada that completed foreign diplomas (as opposed to years spent in education) may act as signalling and grant immigrants access to higher paying jobs. Green and Worswick (2010) show in fact that "sheep skin" effects, the extra return of completing a degree on top of the years of education, are higher for immigrants than for natives.

5.5. Conclusion

The OECD Skills Strategy emphasizes the importance of developing the skills of the workforce and making better use of already existing skills. The immigrant populations bring skills from the home countries that are often different from those of the natives. A better knowledge of the skills immigrants bring, how these are used and rewarded in the host countries labour markets is crucial to ensure that the full potential of immigrants is realised.

This chapter gives an overview of the academic literature on the broad topic of immigrants' skills. Surprisingly little is known about workers' skills, and in particular about immigrants' skills. The most widely used proxy for skills in the literature is educational attainment. The educational attainment of immigrants across European and OECD countries is heterogeneous. It is strongly correlated to the country of origin immigrants come from but also to factors that influence the selection of migrants into the host country: geographical and cultural distance between the home and host countries for instance, and also more directly immigration policy. The relative importance of each factor is difficult to isolate. There is evidence that countries with more selective entry policies based on qualifications do have immigrants who are more educated upon arrival. Establishing more clearly to which extent this relationship is causal would be an

important step forward and would shed light on the leverage host countries have in attracting the desired level of immigrant skills.

There is strong evidence that immigrants get lower returns to education than natives in terms of employment, occupational matching and earnings. This remains true independently of the educational level or the category of entry of the immigrants. A large part of the literature on immigrant assimilation has focused on documenting and understanding this difference in returns. The first explanation is the mismeasurement of actual skills used in the labour market. A large share of immigrants has completed schooling abroad. As the quality of the educational system varies significantly across countries, diplomas that may seem equivalent translate in reality into different skills in the labour market. Differences in language proficiency and institutional barriers to recognition of foreign qualifications also contribute to explain these results.

Another measure of skills which has been used in the literature is scores in literacy tests available from a handful of international surveys. The literacy scores show that foreign education translates into lower literacy skills applicable in the host country. Part of the observed difference in returns to education is linked to differences in skills which are unobserved in most statistical analysis. Understanding why literacy scores are lower for immigrants and which are the specific skills immigrants lack would be an important step forward. There is also no evidence on how immigrants compare to natives with respect to other types of skills, such as skills usually referred to as soft skills, as opposed to cognitive skills. Some immigrants come from very different cultural backgrounds than natives. It is hence likely that the two groups differ substantially in terms of soft skills rewarded in the host country labour market. Understanding to which extent these potential differences in soft skills account for the observed differences in labour market outcomes between immigrants and natives could open the way to a new dimension of immigrant integration policy.

Lack of language proficiency of the host country is also part of the explanation why immigrants may have difficulties in translating existing skills into skills usable in the host country labour market. Although language is a key element, it is important to consider also its complementarities with other skills. There is evidence that speaking the host country language has a larger impact for high-skill occupations. Understanding these complementarities in more depth would allow designing more efficient language training for immigrants.

The explanatory elements above shed light on why immigrants with similar educational attainment may get lower return to education than natives and hence experience worse outcomes in the host country labour market. Another type of explanations focuses on the demand side of the labour market: the reasons that lead employers to prefer to hire natives than immigrants. A first strand of the literature shows evidence of a causal link between immigrants changing their names to host country sounding names or acquiring the host country nationality and the improvement of immigrants' labour market situation. As long as the causal effect is well identified (which is a major challenge), these results imply that part of the immigrants' disadvantage in the labour market is unrelated to their productivity.

Correspondence testing survey also enable to shed some light on this issue. Most of these experiments consist in designing identical quality CVs and randomising only the name of the candidate: a foreign or a native-sounding name. The results are clear: candidates with a foreign name receive lower call-back rates for interviews than candidates with native-sounding names. Recent experiments randomise not only the

names but also other specific aspects of the application, and in particular the country where the education was acquired. Employers are shown to discriminate against workers with foreign qualifications. However, an important result for Canada shows that employers do not discriminate against foreign degrees after some years of host country work experience.

This last result raises an interesting point with relevant policy implications. If after some years of host country experience, employers stop discriminating against foreign degrees, it means that either immigrants have acquired skills during that period (or at least employers believe they have), or employers are risk averse and value the positive signal that the immigrant successfully spent several years in the host country labour market. These two interpretations lead to very different policy recommendations: the emphasis should be on immigrant training in the first years or on measures targeting employer risk aversion. In practice, the latter could be measures to facilitate information on the worker's productivity or allowing for more flexible contracts where the risk of a bad match would be lower. Understanding the employer side better is a key challenge in this literature with potentially important policy implications.

Overall evidence on return to skills of immigrants remain limited and quite dispersed, notably for European countries, including because of the lack of objective measurement for skills. The forthcoming results of the Programme for the International Assessment of Adult Competencies (PIAAC) will hopefully enable to make significant progresses in our understanding of migrants skills and of cross country transferability of skills with a view to better adapt migration and integration policies to make the most of this huge potential for the mutual benefit of migrants and host countries.

Notes

1. The levels correspond in the ISCED classification to: ISCED 0-2; ISCED 3-4; ISCED 5-6.
2. Literacy tests do not measure literacy in the classical sense of the ability to read, but rather the ability to understand and to respond to questions about texts and documents encountered in everyday life.
3. For more details on the tests, please refer to OECD and Statistics Canada (2000).
4. Note that this type of analysis abstracts from entry restrictions linked to immigration policy, which are also expected to play a role in shaping the skill mix of the immigrant population.
5. See OECD (2008) for details on the policies for labour migration across OECD countries.
6. See Aydemir (2012) for a complete literature review on skill based immigration selection.
7. For a recent literature review on "Migrant Educational Mismatch and the Labour Market", please refer to Piracham and Vadean. (2012).
8. Two papers that deal with understanding this bias are Nekby (2007) for Sweden and Constant and Massy (2002) for Germany.
9. Note that education is often measured in years of schooling, lower returns for immigrants may simply reflect the fact that one observes the same range of wages over a broader range of years of schooling (less compulsory education, if at all, in origin countries). This explanation has been overlooked so far in the literature and would deserve some attention.
10. The results on the employment rates are likely to be different for labour migrants in Europe as having a job upon arrival is necessary to obtain the work permit.
11. The results are not driven by differences in the country of origin mix. The specifications control for 11 regions of origin.
12. One may argue that the pool of immigrants in the United States from any given home country is a selected group and that the average quality of schooling from the home country does not reflect the quality of schooling of the immigrant group. This migration selection bias is taken into account in the paper in a two-step Heckmann selection model.
13. This school quality index was originally created by Hanushek and Kimko (2000).
14. These are the most common nationalities of recent immigrants to Canada.

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Annex 5.A1

Educational attainment

Table 5.A1.1. Educational attainment of EU27 foreign-born by year of residence

Country of residence	Native born				Foreign-born EU27				Foreign-born EU27 up to 10 years of residence			
	Total (thousands)	Women (%)	Low-educated (%)	High-educated (%)	Total (thousands)	Women (%)	Low-educated (%)	High-educated (%)	Total (thousands)	Women (%)	Low-educated (%)	High-educated (%)
Austria	5 870	51.3	25.7	14.9	466	50.4	17.5	24.6	167	55.8	14.5	27.8
Belgium	7 749	51.2	38.2	27.6	606	53.3	43.4	29.2	287	51.0	35.3	35.3
Bulgaria	6 518	52.1	33.3	18.1	5	41.9	25.5	22.5	-	-	-	-
Cyprus[1,2]	501	48.8	37.4	27.1	69	52.9	26.4	33.4	47	50.9	29.4	27.8
Czech Republic	8 750	51.3	16.4	13.6	184	50.9	25.3	15.9	36	41.7	7.6	23.5
Germany[17]	60 237	51.0	20.7	21.7	1 915	48.3	32.1	24.2	598	52.8	19.6	30.7
Denmark	4 033	50.2	35.4	25.3	46	49.5	21.9	42.9	20	51.7	20.6	48.4
Estonia	880	52.4	20.9	28.3	9	44.3	28.4	40.3	3	22.3	27.0	57.1
Spain	32 795	51.1	56.9	24.9	1 707	50.7	35.1	26.5	1 066	52.1	36.0	22.1
Finland	4 325	51.3	31.4	28.4	54	47.0	22.3	28.1	18	46.9	32.3	21.3
France	43 608	52.2	36.9	23.3	1 887	53.9	53.3	20.0	347	51.7	39.8	30.8
Greece	8 501	51.3	47.7	18.3	151	63.0	31.7	19.2	78	64.3	38.0	12.4
Hungary	7 543	52.0	28.5	16.4	108	57.6	22.8	28.1	36	54.3	19.1	37.4
Ireland	2 938	51.0	37.8	27.9	349	50.8	23.9	36.8	208	49.0	20.7	37.1
Italy	47 020	51.7	55.5	11.1	1 483	58.2	36.1	11.7	810	58.3	34.9	10.1
Lithuania	2 688	54.2	24.9	24.2	10	58.0	17.8	29.3	-	-	-	-
Luxembourg	223	50.7	32.8	20.4	139	50.1	30.4	38.1	50	47.6	19.5	56.8
Latvia	1 522	52.3	22.2	21.2	22	52.2	30.3	18.2	-	-	-	-
Netherlands	11 821	50.6	35.1	26.2	326	56.0	33.2	31.6	78	59.3	25.8	39.6
Poland	31 397	52.4	23.2	18.1	84	57.1	35.0	16.1	8	34.6	7.3	44.5
Portugal	8 362	52.0	74.1	11.3	152	55.1	39.4	24.2	43	54.7	36.4	20.3
Romania	18 187	51.8	38.1	10.6	-	-	-	-	-	-	-	-
Sweden	5 812	48.8	26.0	27.0	371	53.3	28.8	31.9	82	50.5	22.3	54.7
Slovenia	1 599	51.1	24.1	19.4	12	48.0	21.8	23.7	2	53.5	15.1	47.4
Slovak Republic	4 555	51.9	20.8	14.0	26	56.0	18.2	19.2	4	38.9	29.1	37.1
United Kingdom	36 547	50.1	29.2	29.2	1 878	53.0	19.9	29.6	1 138	50.9	17.1	24.8
EU27	364 187	51.4	36.0	20.4	12 063	53.0	33.8	24.3	5 127	52.9	27.6	25.2

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

The sign '-' corresponds to data cells that do not meet Eurostat threshold for publication; empty cells if data not available.

Source: Eurostat, Labour Force Survey, 2010.

Table 5.A1.2. Educational attainment of non-EU27 foreign-born by year of residence

	Native born				Foreign-born non-EU27				Foreign-born non-EU27 up to 10 years of residence			
	Total (thousands)	Women (%)	Low-educated (%)	High-educated (%)	Total (thousands)	Women (%)	Low-educated (%)	High-educated (%)	Total (thousands)	Women (%)	Low-educated (%)	High-educated (%)
Austria	5 870	51.3	25.7	14.9	708	50.8	44.1	13.5	202	53.7	43.9	19.5
Belgium	7 749	51.2	38.2	27.6	639	51.7	50.2	22.8	319	54.2	49.8	23.7
Bulgaria	6 518	52.1	33.3	18.1	12	69.6	4.7	35.4	-	-	-	-
Cyprus[1,2]	501	48.8	37.4	27.1	73	60.8	32.9	33.0	53	62.5	38.1	27.7
Czech Republic	8 750	51.3	16.4	13.6	80	51.3	18.0	23.6	34	51.8	15.3	22.1
Germany	60 237	51.0	20.7	21.7	3 216	52.9	54.3	15.7	905	57.9	40.4	25.5
Denmark	4 033	50.2	35.4	25.3	170	54.1	37.1	25.3	62	53.7	41.0	25.5
Estonia[16]	880	52.4	20.9	28.3	143	58.6	11.8	35.3	3	55.9	8.9	74.1
Spain	32 795	51.1	56.9	24.9	3 975	50.9	53.4	17.6	2 640	52.0	53.0	16.5
Finland	4 325	51.3	31.4	28.4	88	52.6	33.3	27.7	44	53.8	38.1	24.9
France	43 608	52.2	36.9	23.3	4 387	51.4	50.9	21.9	969	55.8	46.6	27.5
Greece	8 501	51.3	47.7	18.3	649	47.1	54.9	11.4	256	47.6	62.9	10.5
Hungary	7 543	52.0	28.5	16.4	35	51.5	18.9	31.8	11	45.4	19.2	26.6
Ireland	2 938	51.0	37.8	27.9	127	50.9	15.1	56.6	97	50.3	15.2	57.7
Italy	47 020	51.7	55.5	11.1	3 020	51.9	54.0	10.7	1 387	56.1	57.8	9.9
Lithuania	2 688	54.2	24.9	24.2	116	58.7	16.9	27.1	6	45.6	11.3	47.0
Luxembourg	223	50.7	32.8	20.4	26	52.7	26.7	39.3	12	49.5	16.8	56.4
Latvia	1 522	52.3	22.2	21.2	223	57.0	13.5	25.3	8	47.3	7.3	32.3
Netherlands	11 821	50.6	35.1	26.2	1 157	51.9	41.3	25.0	164	61.4	37.2	31.1
Poland	31 397	52.4	23.2	18.1	173	66.4	43.5	15.7	13	76.5	10.4	33.4
Portugal	8 362	52.0	74.1	11.3	505	53.0	55.3	16.6	218	56.1	53.0	11.5
Romania	18 187	51.8	38.1	10.6	10	40.8	19.0	50.0	-	-	-	-
Sweden	5 812	48.8	26.0	27.0	755	52.0	36.6	29.5	271	53.5	43.1	35.3
Slovenia	1 599	51.1	24.1	19.4	147	48.1	34.5	11.1	12	58.8	38.4	7.3
Slovak Republic	4 555	51.9	20.8	14.0	7	61.5	12.7	23.2	4	38.9	29.1	37.1
United Kingdom	36 547	50.1	29.2	29.2	4 086	51.6	23.1	36.9	1 138	50.9	17.1	24.8
EU27	364 187	51.4	36.0	20.4	24 527	51.8	45.1	21.6	9 580	53.6	43.4	23.2

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

The sign '-' corresponds to data cells that do not meet Eurostat threshold for publication; empty cells if data not available.

Source: Eurostat, Labour Force Survey, 2010.

Annex 5.A2

Explanatory factors of the difference in returns to education between immigrants and natives

Table 5.A2.1. Differences in productivity and discrimination as explanatory factors of the difference in returns to education between immigrants and natives

Paper	Countries studied	Target population	Labour market outcomes analyzed & Data and method used	Findings	Main results of the paper (when the difference in returns is not the main issue)
Part A. The differences in returns to education between immigrants and natives are due to differences in productivity in the labour market					
A.1 Immigrants have lower literacy skills than natives					
KAHN L. (2004)	Canada, New Zealand, Switzerland and the US	Foreign-born in the labour force	• Employment rates • Cross sectional IALS data 94-98	• Accounting for differences in test scores (in addition to age, education and ethnicity) explains all the gap in employment rates between immigrant and native men except in Switzerland (and between immigrant and native women in all 4 countries)	• Immigrant assessed skills are on average lower and more dispersed than those of natives • The differences are larger in the US and this is interpreted as a consequence of differences in immigration policy • Differences in employment rates between immigrant and native men (women) are smaller (larger) in the US
DUMONT J.C. and MONSO O. (2007)	OECD countries	Foreign-born medium or high educated in the labour force	• Normative measure of over-education • LFS and Census data for OECD countries + IALS for Australia and 12 European countries	• The odds ratio associated with low quantitative skills (4 levels) are 3 in Australia and 2 in Europe. The differences are smaller for document literacy, but higher for prose literacy in Europe	• Immigrants have higher over-education rates than natives • Women, recent immigrants and immigrants coming from outside the OECD have higher over-education rates
FERRER A. et al. (2006)	Ontario, Canada	Employed foreign-born men (self-employed included)	• Weekly earnings • Ontario Immigrant Literacy Survey (OILS) data for immigrants + IALS (data for natives)	• The native distribution of literacy test scores dominates that of the immigrants but the returns to literacy skills are the same for immigrants than for natives • The difference in returns to foreign versus Canadian-acquired university education are entirely explained by foreign universities generating lower levels of (Canadian-usable) literacy	
BRATSBERG B. and RAGAN Jr. J.F. (2002)	United States	Foreign-born men 25 to 64 who worked positive hours and earned at least 1000$ in 1989, not enrolled in school	• Weekly earnings • US Censuses + the National Longitudinal Survey of Youth (NLSY) + Data on GDP and country language for the home countries	• AFQT test scores do not change the specific returns to the education of immigrants, whether acquired in the home or host country (changes the returns to education of natives and immigrants)	• Immigrants with some US education have higher returns to education than immigrants educated abroad. They get the similar returns to their US and foreign education • The results are not driven by language, individual unobserved ability or growing up in the US • No home country effect if some US education • English skills have an effect if high educated and no US education
BONIKOWSKA A. et al. (2008)	Canada	Employed foreign-born (no self-employed)	• Weekly earnings • Adult literacy and life skills survey (ALL)	• The native distribution of literacy test scores dominates that of the immigrants but the returns to literacy skills are the same for immigrants than for natives • Having English or French as a first language only increases the mean test score by 2 or 3%. Immigrants who completed part of their education in the host country have a much smaller skill gap than immigrnats educated abroad • Raising immigrant average skill levels to the Canadian born level would almost eliminate the earnings disadvantage of high school educated male immigrants; and would produce a substantial earnings advantage among high school educated female immigrants • Among the university educated, for whom the earnings differential is larger, raising immigrant skill levels to the Canadian-born level would reduce the male earnings gap by more than 50 percent and would more than eliminate the female earnings gap, turning the immigrant disadvantage into an advantage	
A.2 Immigrants have low host country language proficiency					
GREEN D. (1999)	Canada	Foreign-born men arriving in Canada after 1973 aged 20 to 64 at migration	• Occupational choice over time • 1981,86, 91 Censuses + landing records • Logit multinomial model of occupational choice; Synthetic cohorts used to study changes over time	• Immigrants who are not fluent at arrival are less likely to be in professional occupations (controlling for observables) and are less occupationally mobile	• Immigrants are more occupationally mobile than natives even long after arrival • Immigrants who are not assessed on their skills or are not fluent at arrival are less occupationally mobile
DUSTMANN C. and FABBRI F. (2003)	United Kingdom	Non-white immigrants (employed full-time for earnings analysis)	• Employment and weekly earnings • Family and Working Lives Survey 94-95 + Fourth National Survey on Ethnic Minorities 93-94 • Propensity matching and language of the interview used as instrument for self-reported language proficiency	• Fluency in English increases the employment probability by 17 ppt, for men and women • Taking into account selection and measurement error increases the coefficient to 22ppt (the result for women becomes small and insignifcant) • Fluency in English increases earnings by 18 to 20% (samples too small to compare men and women) • Taking into account selection and measurement error increases the coefficient but the results become insignificant	
BERMAN E., LANG K. and EREZ S. (2003)	Israel	Foreign-born men from the former USSR in specific occupations: gas station attendant, construction worker, computer technician, software engineer	• Growth in monthly earnings • Workplace Occupational Survey: 348 immigrants who had arrived since 1989 and 603 natives working in the same occupations • Retrospective questions on earnings and language ability on entry into the current job and workplaces	• Computer technicians and software engineers show evidence of considerable wage convergence, much of which can be accounted for by increasing Hebrew fluency: 1 level out of 5 in fluency increases the wage growth by 8 to 10% • Hebrew fluency has almost no effect on wage growth in the low-skill occupations; these occupations show no evidence of wage convergence • A cross section analysis would show wage growth in low-skill occupations linked to Hebrew fluency. This is likely to be driven by ability bias	
CHISWICK B. and MILLER P. (1995)	Australia (and compare to results in other papers from other countries: United States, Canada, Israel, Germany)	Foreign-born	• Yearly gross income (calculated from weekly gross income in intervals multiplied by 52) • 1981 and 1986 Australian Censuses • Estimate the determinants of language fluency and use as instrument for language fluency in the earnings regression determinants of language which are not determinants of language fluency (married before migration, number and age of children, birthplace concentration variable)	• Language fluency impact on earnings is higher for the more educated immigrants • OLS: 5.3% higher earnings if fluency in English (6.4% if not from an English-speaking country). IV: negative and insignificant coefficient in 1982; positive but small and insignificant coefficient in 1986 • Estimates with selectivity correction show a positive selection into the nondominant language fluency market	• The determinants of language fluency are: educational attainment, age at arrival, years of residence, married overseas, number and age of children, country of birth and birthplace-linguistic concentration • The effect of duration of stay on English-language fluency is weaker the older the age at migration and weaker for the better educated than for the less well educated
A.3 Immigrants come from countries with lower quality of the educational system					
BRATSBERG B. and TERRELL D. (2002)	United States	Foreign-born men aged 25 to 64 who acquired all their education abroad	• Weekly wages • Census data for 1980 and 1990 + measures of schooling quality in the home country in 1960 and 1970 • 2 step estimation: estimate returns to education by country of origin; regress the returns on country level explanatory variables	• Calculate the variation in rates of return to education across a large number of immigrant groups • Show the differences in returns are almost completely accounted for by characteristics of the educational system in the source country the pupil-teacher ratio and the expenditure per pupil	
SWEETMAN A. (2004)	Canada	Foreign-born born after 1945 (earliest international test 1965), 25 year old or older who worked at least one week during the year	• Annual earnings • 1986, 1991 and 1996 Censuses + Maths and science average test scores in international standardized tests as a school quality index (from Hanushek and Kimko (2000))	• A substantial portion of the economic return to schooling is associated with educational quality since the return to years of schooling is 25 to 30% lower in the regressions that also include quality measures • Source country school quality does not have an impact on those who immigrate at a young age (10 years old or less) • Quality has an impact at all levels of education (except women with education grade 9 and less) • Individuals with a bachelor degree from the highest scoring country earn 30% more (controlling for everything else) than those with the same degree from the lowest quality educational system. From the first quarter to the third quarter of the quality distribution, the difference is 15%	

Table 5.A2.1. Differences in productivity and discrimination as explanatory factors of the difference in returns to education between immigrants and natives *(cont.)*

Paper	Countries studied	Target population	Labour market outcomes analyzed & Data and method used	Findings	Main results of the paper (when the difference in returns is not the main issue)
A.4 Immigrants lack other skills that are important in OECD labour markets post 1970s					
BEVELANDER P. (2001)	Denmark	Foreign-born men in the first two years in the labour market	• Employment Registry data • Cox proportional hazard model to study the effects of various factors on the time until first employment. Time effects are introduced in different ways to account for structural changes in the economy	• Immigrant men from countries culturally and linguistically further from Sweden have decreasing probabilities of employment in th 1980s (even in the upturn after the mid 1980s)	
ROSHOLM M. et al. (2006)	Sweden & Denmark	Foreign-born men aged 20 to 59, not in education and not self-employed, from Norway, Poland and Turkey	• Employment Registry data from 1985 to 1996 • Probit model with individual fixed effects	• The probability of being employed decreases over time for immigrants in Sweden and Denmark during the period. The decrease is more important for immigrants from Turkey (culturally further away from the host countries) • They argue the change is due to structural factors and not cyclical factors since the effect is similar in both host countries and they had very different macroeconomic conditions	
Part B. The differences in returns to education between immigrants and natives are due to discrimination: employers prefer to hire natives					
B.1 Naturalization has a positive impact on labour market outcomes					
BRATSBERG B., RAGAN Jr. J.F. and NASIR Z.M. (2002)	United States	Foreign born men aged 18 to 64 (not in education) at least five years of residence	• Earnings and type of job (public sector, unionized, white collar) • 1990 Census, 1994-98 CPS (cross-sectional results, much larger sample) and NLSY (panel)	• Naturalized immigrants are more likely to work in public sector, white collar and unionized jobs • The difference is more important for immigrants from less developped countries (measured as GDP/capita of the home country) • The wage growth associated with naturalization arises after the naturalization, not before (timing exploited in the NLSY) • Immediate increased probability of white collar job after naturalization, later increase of unionized and public sector job • Public sector and white collar jobs have higher wage growth, 1/3 of increased wage growth after naturalization comes from moving to these jobs	
BRATSBERG B. and RAAUM O. (2011)	Norway	Foreign born from developing countries and in particular: Middle East, Africa (except North Africa), Asia (East of Iran), the Balkans	• Employment, annual earnings, economic self-sufficiency (no public transfers such as disability, unemployment or social assistance) • Administrative data	• No evidence of an effect of naturalization on top of the effect of years spent in the host country • Discuss differences wrt US results: In NO, no union individual premium; less restrictions to jobs linked to citizenship; "90% of immigrants from developing countries acquire host-country citizenship within ten years", citizenship is less of a signal in this labour market	
B.2 Having a host country sounding name has a positive impact on immigrants' labour market outcomes					
ARAI M. and THOURSIE P.S. (2009)	Sweden	Foreign-born aged 20 to 60 from Asian, African and Slavic countries who change their names to Swedish sounding (or neutral) names in the 1990s	• Annual earnings [set to 1 (log earnings set to 0) if no earnings in a given year] • Register Data. Panel for all foreign-born who change names at some point. Individual and time fixed effects. Exploit the timing of the name change.	• 12% increase in earnings on average before and after name change • The probability of observing positive earnings is 8.2 ppt higher after name change • Effects seem on average stronger for women than for men; however when taking into account the timing of the name change, there is a much clearer effect (discontinuity the year of the name change) for men than for women (when controlling for timing) • RC: No effect for Finnish or other immigrants and also no effect of changing from Middle Eastern to other Middle Eastern name	
B.3 Correspondence testing shows that employers call back native job applicants more often than comparable immigrants					
Authors	**Country**	**The experimental design**		**Findings**	
CARLSSON M. and ROOTH D. (2007)	Stockholm and Gothenburg, Sweden	• Middle-eastern or Swedish sounding names • Male applicants only • Both skilled and semi/unskilled occupations and with high as well as a low ratio of immigrants		• Applications with a Swedish name received fifty percent more call backs • Male recruiters and workplaces with fewer than twenty employees less often call applications with a Middle Eastern name for an interview • Workplaces that have ethnic diversity plans, the share of immigrant employees at the workplace and the ethnicity of	
OREOPOULOS P. (2009)	Greater Toronto Area, Canada	• English vs Foreign sounding name (the 3 largest countries of origin: China, India, Pakistan) • Canadia vs Foreign Experience • Canadian vs Foreign Education • Being fluent in several languages (including French) • Additional Canadian credentials and extra curricular activities • All applicants started working straight after graduation and have 4 to 6 years of experience • The positions applied to require at least an undergraduate degree and 3 to 7 years of experience		• Interview request rates for English-named applicants with Canadian education and experience are more than three times higher compared to resumes with Chinese, Indian, or Pakistani names with foreign education and experience (5 percent versus 16 percent), but are no different from foreign applicants from Britain • Employers value experience acquired in Canada much more than if acquired in a foreign country. Changing foreign resumes to include only experience from Canada raises callback rates to 11 percent • Among resumes listing 4 to 6 years of Canadian experience, whether an applicant's degree is from Canada or not, or whether the applicant obtained additional Canadian education or not has no impact on the chances for an interview request • Canadian applicants that differ only by name have substantially different callback rates: Those with English-sounding names receive interview requests 40 percent more often than applicants with Chinese, Indian, or Pakistani names (16 percent versus 11 percent) • The effects are almost the same whether the jobs applied to require more or less social or language skills • Callback rates are no different between applicants with foreign degrees from high-ranking universities and applicants with foreign degrees from less known schools	
DUGUET et al. (2010)	Paris area, France	• Randomize: • Place of residence (privileged or underprivileged town) • Nationality (French or Moroccan) • French or Moroccan sounding name, forename and surname • Male applicants aged 20 or 22 depending on the job • No unemployment spell and comparable experience in similar jobs • Accounting job openings (2 skill levels: secretary, assistant account and accountant, administrative manager)		• A French citizen with French forename and surname is 20 times more likely to be called back than a Moroccan citizen; 2.5 times more likely than an applicant with a French forename and a Moroccan surname; almost four times more likely than an applicant with Moroccan forename and surname (no citizenship stated)	
McGINNITY F. and LUNN P.D. (2011)	Greater Dublin Area, Ireland	• Names are randomized: Irish, African, Asian, or German • Irish leaving Certificate in minorities CVs to indicate English proficiency • High quality CVs to increase response rate • 3 occupations: lower administration, lower accountacy, retail sales		• Candidates with an Irish name are over twice as likely to be asked to attend an interview as are candidates with an African, Asian or German name • There are no differences between occupations nor between origin groups	

Chapter 6

The qualifications of immigrants and their value in the labour market: A comparison of Europe and the United States

Ana Damas de Matos and Thomas Liebig
OECD

This chapter provides a systematic overview of the qualifications of the foreign-born and their returns in the labour market, both in Europe and the United States, compared with the native-born with similar demographic characteristics living in the same countries. Immigrants with foreign qualifications have on average lower educational attainment levels than the native-born. The differences are larger in the United States than in Europe, and are also larger for immigrants who have been longer in the country. Immigrants with foreign qualifications have lower returns to tertiary education than the native-born in terms of employment and in terms of job quality. There are also large differences in the qualification levels of immigrants and their returns on the labour market depending on their migration category, with labour migrants having higher qualifications and better outcomes than humanitarian and family migrants. Immigrants who report language difficulties have lower employment and higher overeducation than otherwise similar immigrants who do not. Finally, immigrants who have their foreign degrees recognised have significantly lower overeducation rates than immigrants who do not, even after accounting for the origin of the qualifications and the field of study.

6.1. Introduction

For a number of reasons, the issue of the qualifications of immigrants and their use in the labour market has attracted growing attention among EU and OECD countries in recent years. The first is the large and growing share of immigrants in the labour market. Immigrants now represent 13% of the population in OECD countries, and they are over-represented among the highly-educated (that is, those with tertiary education).[1] In European OECD countries, immigrants' share among the tertiary-educated has grown from 12.8% in 2000 to 14.4% in 2010. In Australia, Canada and New Zealand, the growth was even larger on average, from 26.1% to 32.3%. The corresponding increase in the United States has been more modest, from 12.8% to 14.1%. In particular new arrivals are on average now much more qualified than ten years before (see OECD, 2012a).

The observed growth, and this is the second reason, is partly due to an increase in labour migration. Many EU and OECD countries have introduced or reinforced policies to attract labour migrants, in particular the highly-educated. Formal qualifications also weigh heavily in the points systems which are used by a growing number of countries to select labour migrants (see the overview in OECD, 2011a).

Third, increasing the share of highly-educated among the resident population – including both the native-born and immigrants – is seen as a crucial element in ensuring future growth and competitiveness, and is a key target indicator in the EU's 2020 strategy.

Finally, at the same time, there is evidence from a number of EU and OECD countries that immigrants' formal qualifications are less valued in the host-country labour market than those of the native-born. Better using immigrants' qualifications has also been identified as an important policy objective by the OECD Skills Strategy (OECD, 2012b).[2] A better understanding of immigrants' formal qualifications, how these are used in the labour market and the obstacles that prevent immigrants to find their formal qualifications fully valued in the labour market – whether it is poor language knowledge, the lack of recognition of diplomas or of foreign work experience, employer discrimination or other factors – would also potentially help designing better targeted labour migration and integration policies.

In spite of this, to date there has been no systematic study of the formal qualifications of immigrants and their use in the labour market across EU and OECD countries.[3] The present chapter provides a first attempt to fill this gap, by comparing the situation in EU countries, Norway and Switzerland with that in the United States. The remainder of this chapter is structured as follows. Section 6.2 documents how the qualifications of different groups of immigrants compare with those of similar native-born. It focuses in particular on the differences linked with the origin of the qualifications and with migrant category (that is, by reason of entry). The latter distinction is rarely made in academic work, often because of lack of available data, but is a crucial one for policy. Indeed, only labour migrants are directly "selected" – either by the employer, or by the national administration, or a mix of both – whereas there is at most an indirect "selection" of family and humanitarian migrants. Section 6.3 compares, for the different groups of migrants under consideration, the returns to the qualifications of immigrants to those of the native-born, both in terms of access to employment in general and for qualified workers in terms of access to jobs that match their formal qualifications. Section 6.5 analyses how two specific issues, language difficulties and the recognition of foreign qualifications, are linked with immigrants' returns to their qualifications in the host country labour market. Section 6.5 concludes.

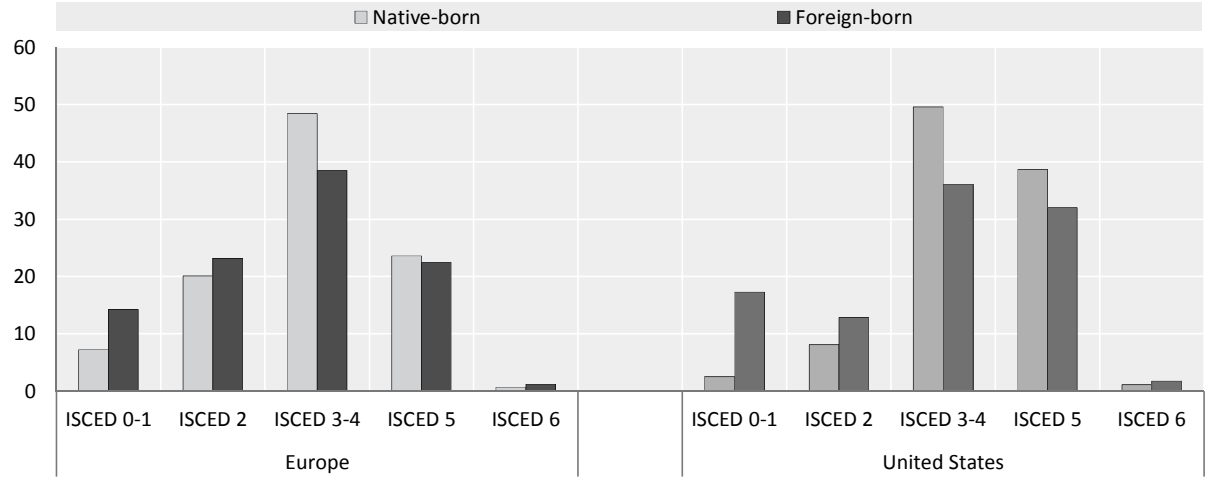
6.2. The qualifications of immigrants

Overview

A first look of the distribution of the educational attainment of the total native-born and foreign-born in Europe (that is, the 27 countries of the European Union plus Norway and Switzerland) and in the United States is presented in Figure 6.1. Compared with the native-born, the foreign-born are over-represented in the two lowest levels of education, that is at most primary education (International Standard Classification of Education: ISCED 0 and 1) and the first stage of secondary education (ISECD 2) which corresponds to compulsory education in most European countries), and under-represented among individuals who complete upper-secondary and post-secondary non-tertiary education (ISCED 3 and 4). In these two OECD regions, there is also an under-representation of immigrants among those with a university degree (ISECD 5 and above), with the exception of the small group of doctorates (ISECD 6). Globally, the differences tend to be larger in the United States than in Europe.

Figure 6.1. The educational attainment of the native-born and the foreign-born

Percentage distribution



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. ISCED: International Standard Classification of Education.

Source: European countries: Labour Force Surveys, 2009-2010. United States: Current Population Surveys, 2009-2011.

In the following, in addition to qualification levels, we also use as an alternative measure the age the highest level of education was successfully completed minus six (the usual starting age of school), which provides the estimated *years of education.* Both measures have their advantages and disadvantages. While are a convenient and synthetic measure of qualifications, using the ISCED classification allows capturing the eventual discontinuities in years of education associated with the completion of specific levels of education and does not rely on assumptions about school starting age and is not, in principle, influenced by grade repeats. On the other hand, years of education gives an interval measure (in contrast to ISCED, which is only ordinal) that can be easily compared by means of a single figure.

At this highly aggregate level, the picture is similar for both measures. Both in Europe and in the United States, immigrants spend fewer years in education than the native-born. In Europe, the native-born complete their highest educational degree at an average age of 19.7, whereas immigrants do so at the average age of 18.7. In the United States, while the native-born complete their highest degree aged 19.5, immigrants do so at the age of 18.

Foreign versus host-country qualifications

There is growing evidence that foreign qualifications, particularly those that have been obtained in lower-income countries, are discounted in the labour markets of OECD countries [see, for example, Bratsberg and Ragan (2002) for the United States, Nordin (2007) for Sweden, and Clark and Lindley (2009) for the United Kingdom]. This may be due to lower performance of education systems in some origin countries, to lack of host-country language proficiency or of lack of other host-country specific human capital associated with foreign education, or to employer difficulty in evaluating its value (see Section 6.3 on the recognition of foreign qualifications).

Thus far, however, there has been no systematical cross-country analysis of the differences in labour market performance between immigrants with host-country qualifications and those with foreign qualifications in the OECD. One of the contributions of the present chapter is to systematically compare immigrants who obtained their highest degree in the origin country with those who obtained it in the host country.[4] For simplicity, these two groups are referred to below as having foreign education/qualifications or host-country education/qualifications, respectively.

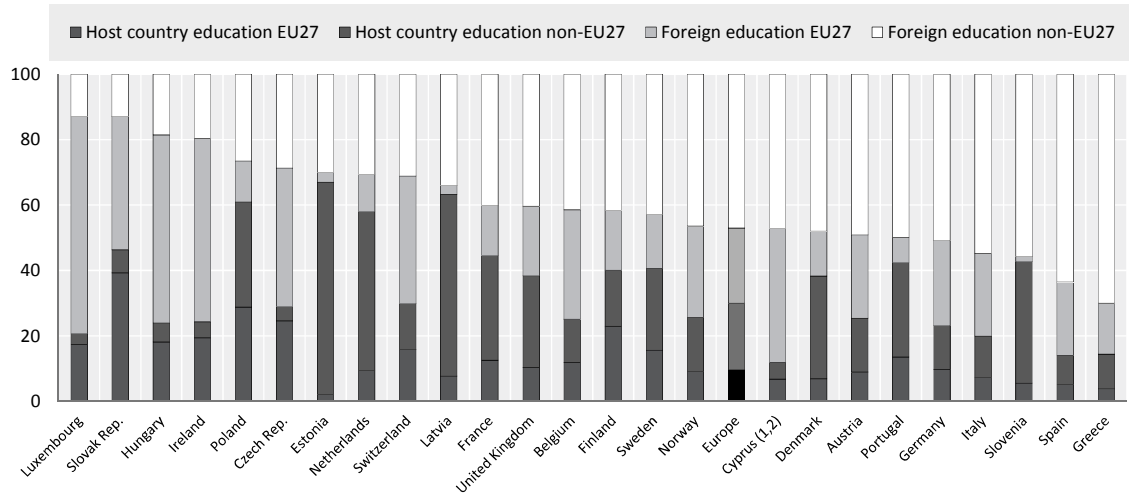
Both in Europe and in the United States, 69% of the foreign-born have completed their education outside of the host country. In the analyses below, immigrants in Europe will be further separated into immigrants from the EU27 and migrants from other countries. The first group benefits from free movement in the EU/EFTA, which also includes a number of provisions to foster transferability of formal qualifications. The proportion of foreign qualifications among EU27 migrants, who represent 38% of all immigrants in Europe, is virtually the same as among all migrants, i.e. slightly more than two-thirds.

While this percentage is about same in the United States and in Europe taken as a whole, there is some heterogeneity across European countries. Figure 6.2 shows for each country the composition of the immigrant population according to the origin of the qualifications and the country of origin of the migrant (EU or non-EU). In Luxemburg, more than 80% of the foreign-born come from another EU27 country. In Switzerland, this percentage is also high, at 65%. On the other hand, the share of EU immigrants is closer to 30% in France, Italy, Spain or Portugal.

In all but four European countries, the majority of immigrants have foreign qualifications. Three of these – Estonia, Latvia and Poland – have small immigrant populations which, in addition, have been partly shaped by border changes. The only exception is the Netherlands, where non-EU migrants with host-country education are by far the largest group.

Figure 6.2. Distribution of the origin of the qualifications of the foreign-born in Europe, by country of residence

Percentages



Note: Four countries (Bulgaria, Malta, Lithuania and Romania) are not represented in the figure since the number of immigrants of at least one of the categories does not meet the Eurostat threshold for publication.

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: European countries: Labour Force Surveys, 2009-2010. United States: Current Population Surveys, 2009-2011.

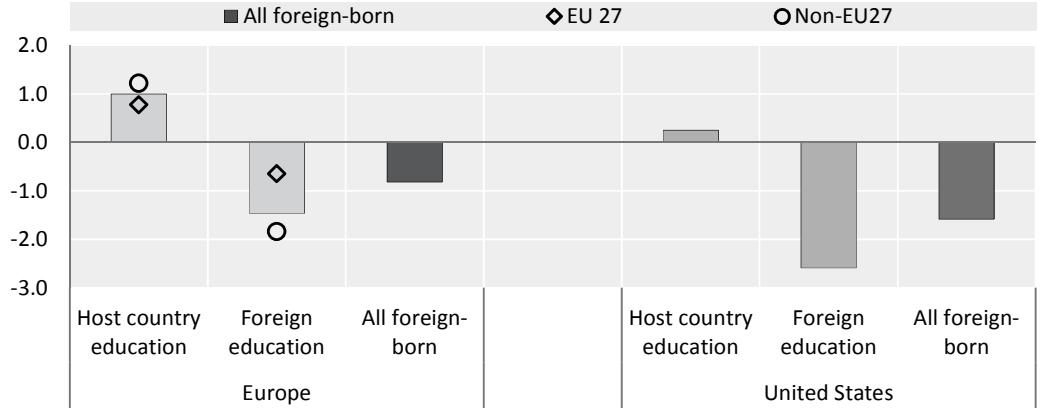
The educational attainment of immigrants

Years of education

Following this initial aggregated analysis, the remainder of the chapter will look at how the qualifications of the foreign-born compare with those of the native-born with similar demographic characteristics (age, gender) that are living in the same country. Controlling for demographic characteristics is particularly important in the context of the significant educational expansion that has globally occurred over the past half century.

Figure 6.3 compares the *years of education* of the foreign-born depending on the origin of their qualifications to the ones of the native-born.[5] On average, immigrants have studied almost a year less than native-born of the same age and gender in Europe and one and a half years less in the United States. Separating immigrants by the origin of their qualifications shows a clear pattern. Immigrants who have completed their education in the host country have studied on average more than native-born, in particular in Europe. In contrast, immigrants with foreign qualifications have spent two and a half less years in education in the United States and close to two years less in Europe (for immigrants with non-EU qualifications). A disaggregation by gender shows no strong differences between men and women, neither in Europe nor in the United States (see Figure 6.A1.1 in the annex).

Figure 6.3. Years of education of the foreign-born compared with the native-born



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The bars represent the estimated differences in years of education controlling for gender and five year age groups (and country fixed effects in Europe) resulting from an ordinary least squares regression. The difference is first estimated for all foreign-born and then for the foreign-born split by the origin of their highest qualification. The estimated coefficients are presented in Table 6.A1.1 in the annex.

Source: European countries: Labour Force Survey 2009-2010. United States: Current Population Survey 2009-2011.

Table 6.A1.8 in the annex shows the results separately for each of the European countries. It becomes evident that the results presented above are driven by the EU15 and EFTA countries as these have much larger immigrant populations than the new EU member countries. Only in four countries do the foreign-born compared with the native-born have the same or a higher disparity regarding years of education as in the United States – Belgium, Germany, the Netherlands and Switzerland. When looking only at those with foreign education from non-EU countries, however, the gaps in the years of education are large in several other countries as well – they amount to three years more in France and the Netherlands, in addition to the four countries just mentioned. Again, immigrants with host country education generally have at least as many years of education as comparable native-born, independent of their origin.

Host-country education and year of arrival

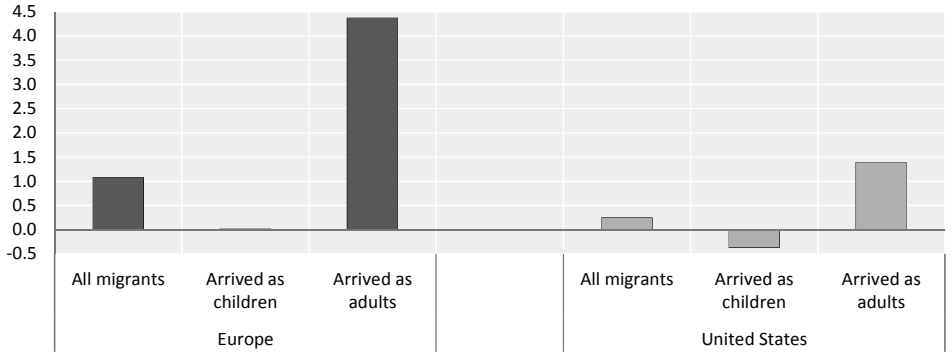
The estimations above relate to all immigrants, including those who arrived in the host country with completed education. In this section, we focus on the educational attainment of immigrants who acquired their highest educational level in the host country. A large majority of these immigrants arrived in the host country at a young age and are likely to be a quite distinct group from the immigrants who arrived in the host country after completing their education.

Immigrants who migrated before they were aged 15 are compared with immigrants who arrived at an older age. The somehow arbitrary age threshold was chosen taking into account that in most European countries and states in the Unites States, compulsory education ends at approximately age 15. An individual born abroad and having arrived in the host country before age 15 will generally continue his or her education at least for a few years in the host country. An individual migrating after the age of 15 who completes his/hers education in the host country has chosen to study in the host country, independent of the reason for migration while 70% of immigrants with a host-country degree in Europe, and 66% in the United States, have migrated at an age younger than 15.

Approximately 10% of the total number of immigrants in Europe and the Unites States who immigrated at the age of 15 and above have a host country degree.

Figure 6.4 shows the *years of education* of immigrants with host-country qualifications depending on whether they migrated before or after the age of 15 compared with similar natives. On average, immigrants with host country qualifications are more educated than the native-born. This result is nevertheless driven by the small group of immigrants who arrived at age 15 or older. There is only a small difference between the native-born and immigrants who migrated before this age threshold. This is the case both in Europe and in the United States. Immigrants who came to the host country to study, or decide on studying after arrival, end up having on average higher educational attainment than natives. Nevertheless, the differences in education between those who immigrated at the age of 15 and above and natives seem to be larger in Europe than in the United States. Immigrants who arrived in Europe as children from other EU countries have slightly lower years of education. There is no significant difference in years of education among EU27 and migrants from other countries that arrived aged 15 and older and who completed their education in the host country.

Figure 6.4. Differences in years of education between the foreign-born educated in the host country and the native-born, by age of migration



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The bars represent the estimated differences in years of education for the foreign-born with host-country qualifications compared with the native-born, controlling for gender and five year age groups (and country fixed effects in Europe) resulting from an ordinary least squares regression.

Source: European countries: Labour Force Surveys 2009-2010. United States: Current Population Survey 2009-2011.

Levels of education

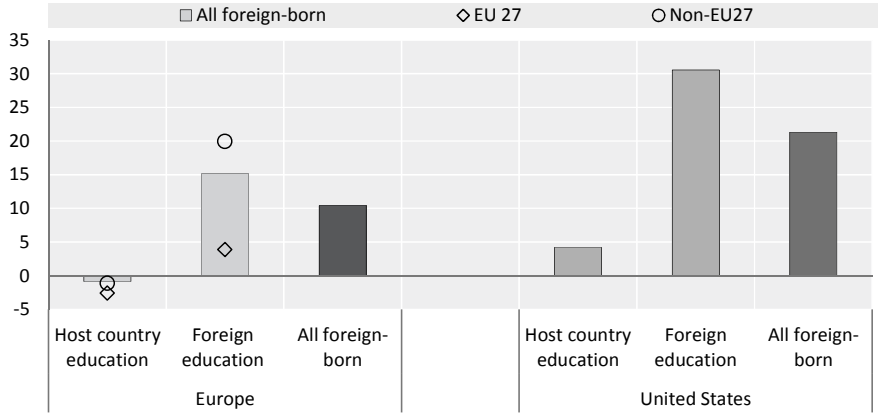
Figures 6.5 and 6.6 show the differences in educational attainment between immigrants and native-born for two specific education levels: lower-secondary education (ISCED 0-2) and tertiary education (ISCED 5-6). Again, the bars represent the coefficients from linear regressions of an indicator variable on age groups and gender (and country effects for Europe). The indicator equals one of the highest education level obtained is at most lower-secondary education in Figure 6.4, and if the individual completed some form of tertiary education in Figure 6.6.

On average the foreign-born are more likely than the native-born to have completed at most lower-secondary education. In Europe, the result is mainly driven by immigrants who completed their education in non-EU27 countries. These are 20 percentage points more likely than native-born to have completed at most lower-secondary education. Only

27% of native-born across Europe have at most a lower-secondary education level, while about 54% of immigrants from non-EU countries have at most a lower-secondary qualification. In the United States, the rate of immigrants with foreign education who have at most lower-secondary education is also on average 30 percentage point higher than for the native-born, which represents also a threefold increase compared with the proportion of native-born who achieve at most this level of education.

Figure 6.5. Prevalence of basic education as the highest educational attainment of the foreign-born compared with the native-born

Percentage points

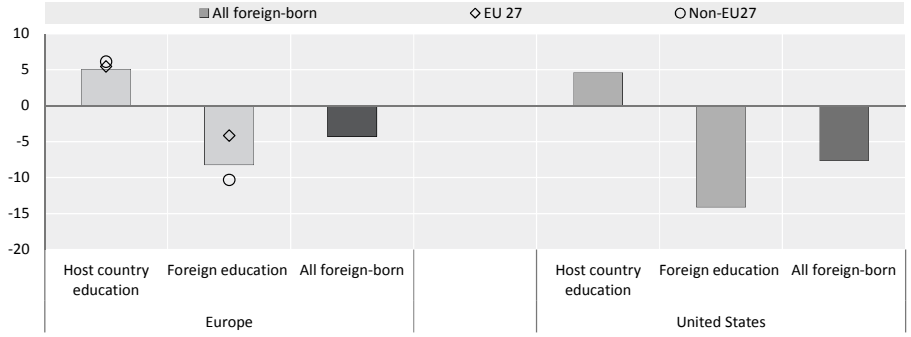


Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The bars represent the estimated differences in the share of persons with less than upper-secondary education between the foreign-born and the native-born, controlling for gender and five year age groups (and country fixed effects in Europe) resulting from an ordinary least squares regression.

Source: European countries: Labour Force Surveys 2009-2010. United States: Current Population Survey 2009-2011.

Figure 6.6. Prevalence of tertiary education as the highest educational attainment of the foreign-born compared with the native-born

Percentage points



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The bars represent the estimated differences in the share of persons with tertiary education between the foreign-born and the native-born, controlling for gender and five year age groups (and country fixed effects in Europe) resulting from an ordinary least squares regression.

Source: European countries: Labour Force Surveys 2009-2010; United States: Current Population Survey 2009-2011.

The difference is even larger when considering the individuals who completed at most primary education. These represent 7% of the native-born across Europe, and 2.5% in the United States, but the estimated proportion for immigrants from non-EU countries with foreign education is more than three times higher – at 24% – and seven times higher for immigrants in the United States.[6]

At the other end of the educational distribution, immigrants with foreign education from non-European countries are only a third to half as likely to have completed some form of tertiary education than similar native-born in Europe. The results are similar for all immigrants in the United States. The average proportion of native-born with tertiary education is 24% in Europe and 40% in the United States. Immigrants from non-EU countries are 10 percentage points less likely to have a tertiary education than the native-born, 14 percentage points in the United States for immigrants with foreign degrees.

Comparing levels of education gives only a partial description of the qualifications of immigrants, mainly with respect to their use in the labour market. Another aspect is the field of the education acquired, particularly for highly educated workers. Figure 6.7 shows the representation of the native-born and of the foreign-born of the different groups in each field of education for workers with tertiary education in Europe.[7] The main message from these graphics is that the differences between groups across fields are relatively small. The distribution of tertiary-educated immigrants and the native-born among fields of education is similar, at least at this rather aggregated level, regardless of where the education was obtained and whether immigrants are from EU countries or not.

Years since migration for immigrants educated abroad

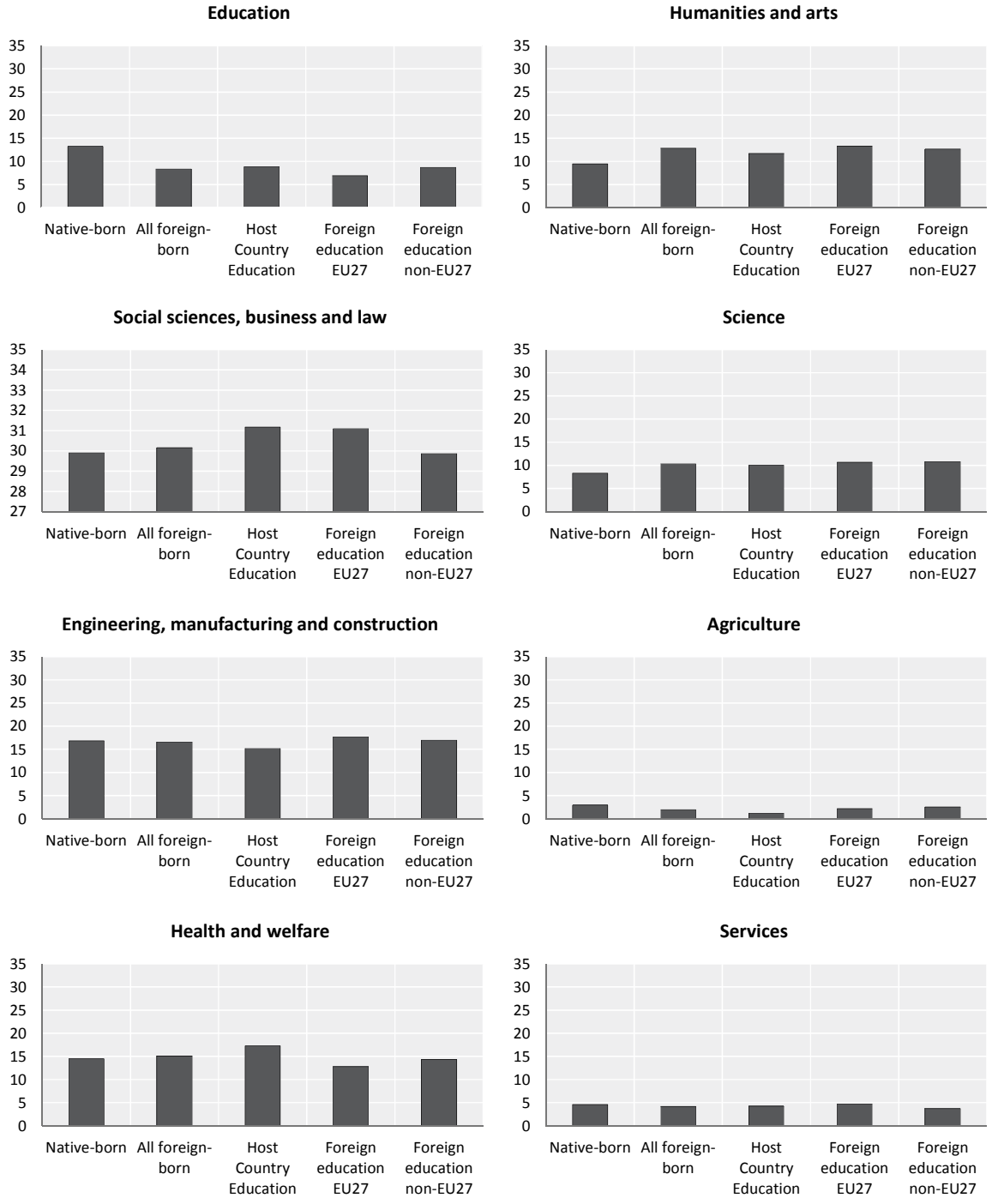
There is some evidence that immigrants from more recent cohorts are more educated than immigrants from older cohorts in OECD countries (Widmaier and Dumont, 2011). However, these previous studies do not control for age differences and hence do not take into account the fact that educational attainment levels of native-born have also risen over time. In this section, we compare the *years of education* of immigrants of the different cohorts to those of native-born of the same age group and gender within the same country. We restrict the analysis to immigrants who completed education abroad; these represent – as mentioned above – 69% of all immigrants.[8]

Figure 6.8 plots the *years of education* for immigrants by five year intervals of years of residence compared with native-born controlling for age, gender and country fixed effects in the European specification.[9] The pattern is clearly monotonic; the more recent the immigrants are, the more educated they are compared with native-born of the same age groups in the same countries. The increase in the relative educational level of immigrants is higher in Europe than in the United States. In Europe, although EU27 immigrants are more qualified than non-EU immigrants across all cohorts, the relative education level has increased for immigrants from all origins.

As with most estimations dealing with immigrant cohorts, these patterns must be interpreted with caution. The observed pattern may be driven by an increase in the relative qualifications of immigrants in the most recent cohorts but may also just as well be driven by selective outmigration of the most qualified immigrants over time. The fact described here is that among immigrants in the host country at a point in time (2009/11), immigrants from more recent cohorts are more educated than those from older cohorts when compared with similar native-born.

Figure 6.7. Fields of study of tertiary-educated native and foreign-born

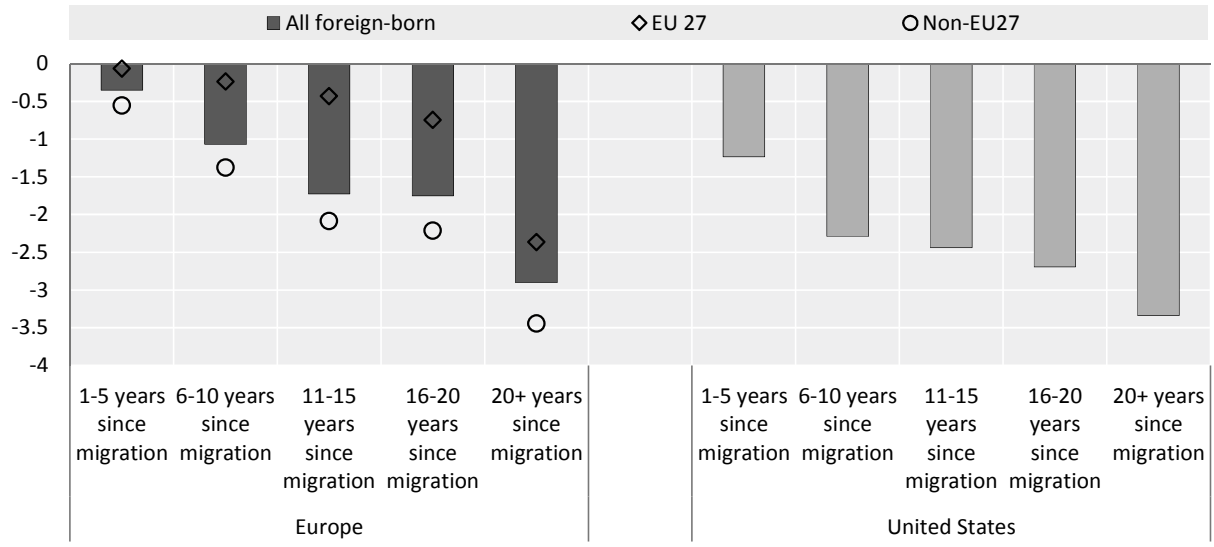
Distribution in percentages



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education.

Source: European countries: Labour Force Survey 2009-2010; United States: Current Population Survey 2009-2011.

Figure 6.8. Years of education of the foreign-born educated abroad compared with the native-born, by years of residence in the host country



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The bars represent the estimated differences in years of education for the foreign-born with host-country qualifications compared with the native-born, controlling for gender and five year age groups (and country fixed effects in Europe) resulting from an ordinary least squares regression.

Source: European countries: Labour Force Survey 2009-2010; United States: Current Population Survey 2009-2011.

Qualifications and the reason to migrate

One of the main differences among immigrant groups is the reason for migration. The characteristics of immigrants who migrate to the host country to study, to work or for humanitarian reasons are likely to differ. The qualifications the different types of migrants bring to the host country and how these are valued in the labour markets are also likely to be distinct.

According to OECD (2012), 36% of permanent migration flows to OECD countries in 2010 were family–related, and 21% were work related (approximately 40% when considering both work and free-movement flows). There is significant heterogeneity across countries: Canada, New Zealand and Australia have high proportions of labour migrants and accompanying families; the same has been the case in the Southern European countries prior to the great recession of 2008-09. Humanitarian migration is more common in the other European OECD countries with significant immigrant population. These numbers exclude free circulation in the European Union which accounts for a large part of work-related migration in the area. In Switzerland, for instance, free movement migration accounts for 71% of permanent-type migration.

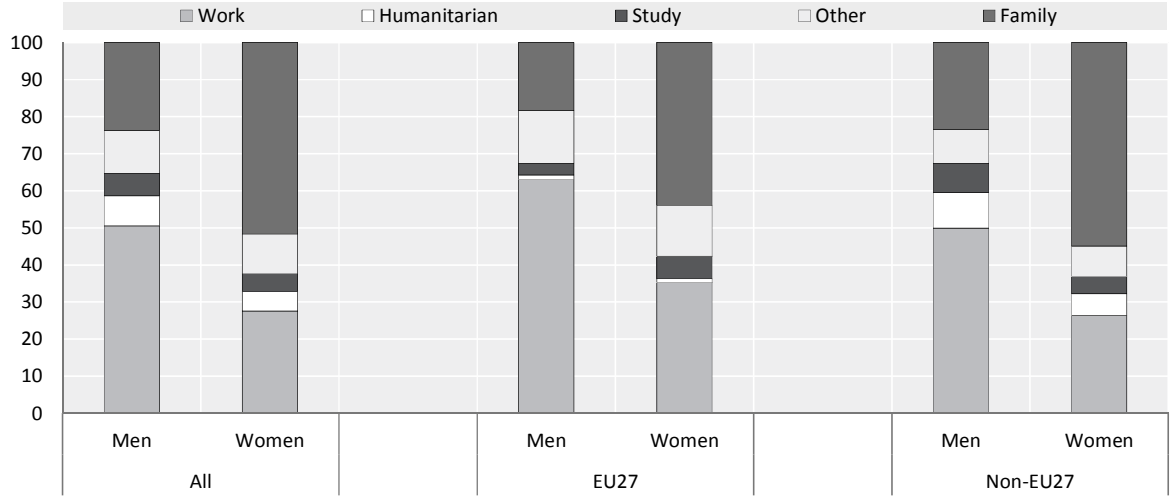
A large share of immigrants in OECD countries is hence not directly selected, since they migrate for family reasons, under free movement agreements or for humanitarian reasons. The only margin on the policy side to attract skilled work into the host countries is the size and composition of the inflow of labour migrants. This section describes the qualifications of immigrants taking into account the differences in the reason to migrate.

In 2008, the European Union Labour Force Survey included information in some countries on the category of migration, i.e. the self-reported reason for the first migration to the host country.[10]

Figure 6.9 shows the distribution of the self-reported reason for migration of immigrants in Europe separately for men and women. Among immigrants who arrived in the host country aged 15 and older, more than 50% of men declare having migrated for work, 20% for family reasons, and less than 10% for humanitarian reasons. For women, the distribution is significantly different: more than half of immigrant women declare having migrated for family reasons and around 25% for work reasons. The proportions of those who migrated for work are twice as large for EU migrants than for non-EU migrants, for both gender.

Figure 6.9. Self-reported reason for migration, by gender

Percentages



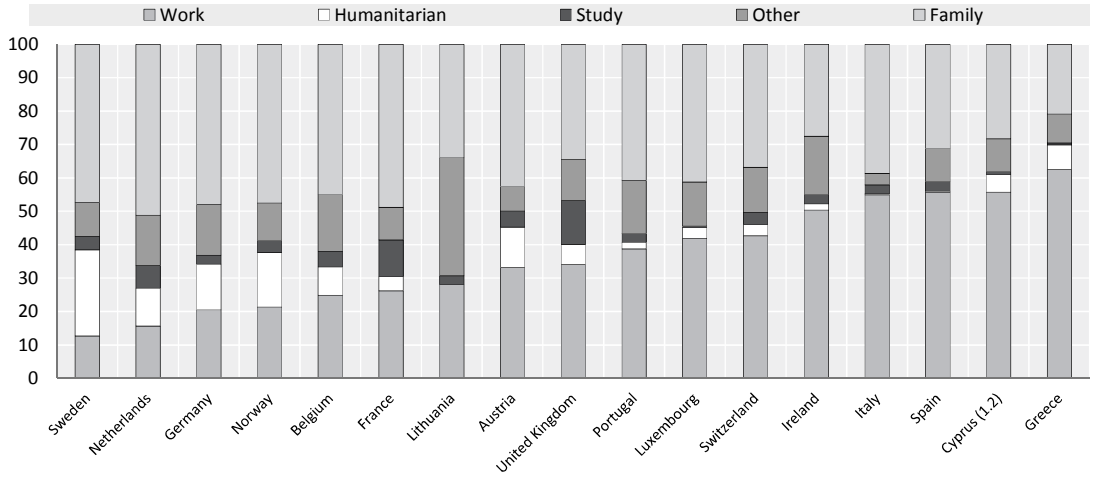
Note: Restricted to foreign-born individuals aged 15-64 out of full-time education who immigrated at the age of 15 and above.

Source: Labour Force Survey ad-hoc module 2008.

Figure 6.10 shows the distribution of the reasons to migrate for the countries included in the ad-hoc module of the labour force survey. In the recent immigration countries, such as Spain, Greece and Italy, most immigrants migrated for work reasons. In longstanding European countries of immigration, such as France, Germany, and Belgium, most migrants declare to have migrated for family reasons. Humanitarian migrants make up a large proportion of the immigrant population in the Nordic countries, such as Sweden and Norway.

Figure 6.11 shows the distribution of the origin of the qualifications for each group of immigrants. Among immigrants who migrated for work purposes, approximately half are from another EU27 country, and most have acquired their education abroad. The overwhelming majority of immigrants migrating for family and humanitarian reasons have completed their education abroad. Among immigrants who declare having migrated to study, almost 70% are from non-EU27 countries and approximately 40% have acquired their highest educational level in the country of origin.

Figure 6.10. Composition of the foreign-born population by reasons to migrate, by country



Note: Restricted to foreign-born individuals aged 15-64 out of full-time education who immigrated at the age of 15 and above. The years of education are constructed using the year of graduation minus seven. Note that this proxy suffers from several shortcomings, since the school starting age is not the same in all countries. In addition, grade repeats – which are sizeable in numbers in some countries – are counted as additional years of education. Finally, the same years of education are not necessarily associated with the same formal levels of qualification, in particular in some European countries where secondary and tertiary education takes longer to complete.

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

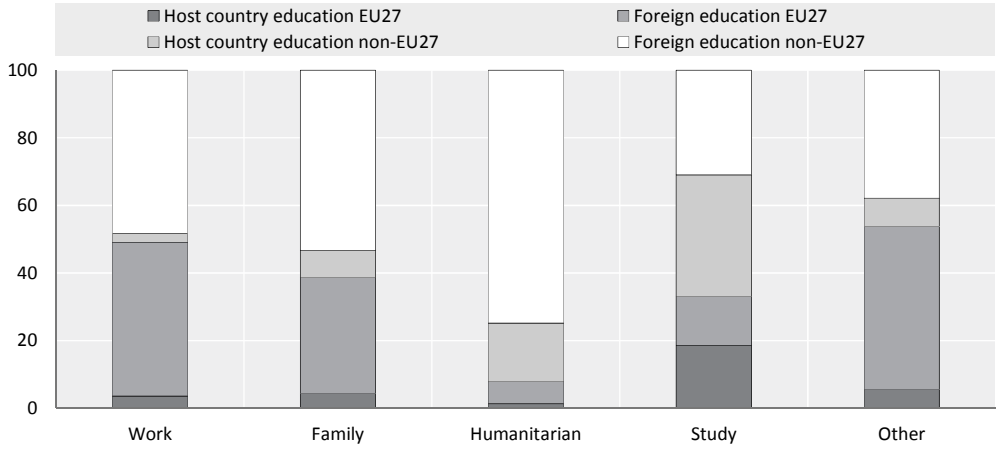
2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: Labour Force Survey ad-hoc module 2008.

The origin of the immigrants' qualifications is highly correlated with their reason to migrate, as shown in Figure 6.11. We documented above that immigrants with foreign qualifications, and in particular with non-EU qualifications, have lower education levels both compared with the native-born and with immigrants who finished their education in the host countries. In order to know to which extent this pattern is driven by the immigrants' reason to migrate, column 3 takes into account both the reason to migrate and the origin of the qualifications. The ranking of the different immigrant groups with respect to the *years of education* remains the same once differences in the origin of the qualifications are accounted for. Likewise, the differences in educational attainment between immigrants with host country and foreign qualifications, and in particular non-EU qualifications, remain similar to the ones documented above. These differences are hence not mainly driven by the different groups of immigrants.

Table 6.1 presents the differences in *years of education* among the different groups of immigrants by reason to migrate, accounting for individual characteristics and differences in the origin of the qualifications. Immigrants who declare to have migrated to study are on average much more educated than the native-born, whereas immigrants who migrated for work, family or humanitarian reasons are less qualified than similar native-born, and less so in this order. Column 2 compares men and women; men who migrate for work are less educated than women who do so compared with native-born, men and women). Among family migrants, women are relatively less educated than men.

Figure 6.11. The origin of the qualifications of the foreign-born by reason for migration



Note: Restricted to foreign-born individuals aged 15-64 out of full-time education who immigrated at the age of 15 and above.

Source: Labour Force Survey ad-hoc module 2008.

Table 6.1. Years of education and the reason to migrate

	(1)	(2)	(3)
Work	-0.862***	-0.327***	4.275***
	(0.0589)	(0.0910)	(0.146)
Family	-1.218***	-1.364***	3.844***
	(0.0610)	(0.0719)	(0.139)
Humanitarian	-1.376***	-1.517***	3.588***
	(0.159)	(0.244)	(0.216)
Study	3.829***	3.875***	7.030***
	(0.143)	(0.189)	(0.153)
Other	0.0304	0.0873	5.064***
	(0.111)	(0.148)	(0.172)
Work x Men		-0.857***	
		(0.118)	
Family x Men		0.515***	
		(0.136)	
Humanitarian x Men		0.239	
		(0.322)	
Study x Men		-0.0880	
		(0.283)	
Other x Men		-0.115	
		(0.223)	
EU27			0.0183
			(0.207)
Foreign education			-4.579***
			(0.186)
Non-EU27 education			-1.164***
			(0.223)
Robust standard errors in parentheses			
*** p<1%, ** p<5%, * p<10%			

Note: Restricted to foreign-born individuals aged 15-64 out of full-time education who migrated at the age of 15 and older. The coefficients are estimated from a linear regression controlling for gender, five year age groups and country fixed effects. All specifications include a constant.

Source: Labour Force Survey ad-hoc module 2008.

6.3. The value of immigrants' qualifications in the labour market

This section compares the returns in the labour market to qualifications of immigrants and the native-born. We consider two outcome measures: access to employment – as measured by the employment rate – and the match of the occupation with the education level, measured by the overqualification rate of the tertiary-educated. Wages are the most frequent measure in the literature but are unfortunately not yet available in the European Union Labour Force Survey for most countries. All estimations are done separately for Europe and the United States.

The estimations in this section are generally of the following form:

$$Y_i = \alpha FB_i + \gamma EDU_i + \zeta EDU_i * FB_i + X_i \beta + C_i + \epsilon_i,$$

Where Y is an outcome measure for individual i .-an indicator that equals 1 if the individual is employed or overeducated; FB is a dummy for foreign-born; EDU is a measure of educational attainment (years of education or education levels); X are individual characteristics such as age and gender and C are country-fixed effects (for the European countries).

If we omit *EDU*FB* from the estimations, α would be the mean difference between immigrants and the native-born in the outcome considered, taking into account differences in education, individual characteristics and country effects. ζ is the difference in returns to education between immigrants and the native-born, and α is hence the difference in outcomes between groups that is not explained by differences in returns to education.

Employment

We start by documenting differences in returns to education between the native-born and the foreign-born in terms of employment (i.e., the outcome considered is an employment dummy). Table 6.2 shows the estimates of the coefficients from the specification above.

Immigrants have an employment rate that is on average 9 percentage points lower than that of the native-born with the same years of education, same age group, gender and living in the same country in Europe. In the United States, the gap in terms of employment rates is estimated at only 3 percentage points. Column 2 introduces different returns to years of education for immigrants and the native-born. Returns to years of education are 25% lower for immigrants than for the native-born in Europe and more than 50% lower in the United States. This difference in returns accounts for the entire immigrant-native employment gap. Column 3 introduces different returns to foreign qualifications, and also to non-EU27 qualifications in Europe. The lower returns in terms of employment to immigrant qualifications are not only driven by foreign qualifications. Immigrants with host country qualifications also have lower returns to years of education than the native-born but nevertheless higher returns than immigrants with foreign qualifications. The returns to foreign qualifications are close to half the returns to the years of education of the native-born, in both Europe and the United States.

Table 6.2. Education-related determinants of the employment rate

Percentage points

	Europe				United States		
	(1)	(2)	(3)	(4)	(1)	(2)	(3)
Foreign-born	-9.07***	1.11	4.26***	2.11	-2.79***	51.5***	39.2***
	(0.174)	(0.697)	(1.39)	(1.43)	(0.230)	(1.15)	(2.33)
Years of education		1.89***	1.89***	1.89***		4.19***	4.19***
		(0.0104)	(0.0104)	(0.0104)		(0.0373)	(0.0373)
Foreign-born x Years of edu.		-0.470***	-0.00503***	-0.00477***		-2.65***	-1.95***
		(0.0353)	(0.0646)	(0.0646)		(0.0595)	(0.114)
Foreign education			9.48***	6.79***			16.0***
			(2.01)	(2.02)			(2.46)
Foreign education x Years of edu.			-0.378***	-0.403***			-0.953***
			(0.0973)	(0.0973)			(0.124)
Non-EU27 education			-11.5***	-6.70***			
			(1.75)	(1.85)			
Non-EU27 edu. x Years of edu.			0.0784	0.0780			
			(0.0906)	(0.0906)			
EU27				4.84***			
				(0.611)			

Robust standard errors in parentheses
*** p<1%, ** p<5%, * p<10%

Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an employment dummy controlling for gender, five-year age groups and years of education (and country fixed effects in Europe). All specifications include a constant.

Source: European countries: Labour Force Surveys, 2009-2010. United States: Current Population Survey, 2009-2011.

Immigrants with non-EU27 education in Europe have lower employment on average but the returns to non-EU27 years of education are not significantly different from the returns to years of education completed in another EU27 country. Column 4 for Europe shows that immigrants from other EU27 countries have higher employment rates than comparable immigrants from other origins, independent of their education level or where their education was completed.

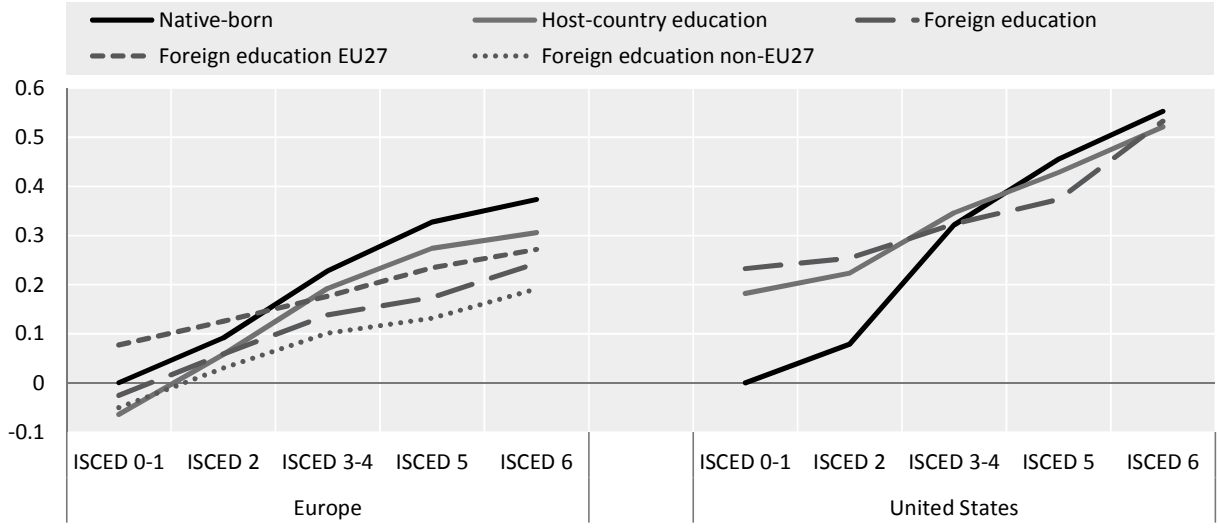
The patterns are similar for men and women when analysed separately. The results are presented in Table 6.A1.2 in the annex. The mean employment rate for native-born men is 78% and it is estimated to be 6 percentage points lower for the foreign-born. For native-born women, the mean employment rate is 65% and it is estimated to be 12 percentage points lower for foreign-born women. Both immigrant men and women have lower returns to their education, particularly if it was acquired abroad. The returns to qualifications from other EU countries are lower for women but not significantly lower for foreign-born men.

It is conceivable that returns to years of education may not be linear, and notably that the completion of specific levels of education may be associated with higher returns. We now turn to estimating the differences in returns to the completion of education *levels* for immigrants and the native-born.

Figure 6.12 plots the estimated returns to education levels for the native-born and different immigrant groups. The coefficients for the different specifications are presented in Table 6.A1.3 in the annex. We first consider the full lines in the graphs. They represent the returns to education for the native-born and immigrants with host country education.

These are plotted taking the employment rate of the native-born with the lowest level of education (primary education) as reference. The slope of the lines for the native-born and immigrants with host-country education are similar in Europe; this is also the case in the United States for higher education levels. This implies that the returns to the completion of an education level are similar for both groups. Independently of the education level, immigrants with host-country education have a lower employment rate than the native-born in Europe but not in the United States.

Figure 6.12. The employment rate as a function of the highest educational attainment



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The coefficients to plot the full-lines are taken from the specification in column 3 in Table 6.A1.3, which is the equivalent specification to column 3 in Table 6.2 above. The dashed lines for Europe are plotted from the specification in column 4 in Table 6.A1.3.

Source: European countries: Labour Force Surveys, 2009-2010. United States: Current Population Survey, 2009-2011.

The line for immigrants with foreign qualifications has a clearly less steep slope than the one for the native-born in Europe. In particular, the returns to completing higher-secondary education or tertiary education (equivalent to a BSc or MSc level) are lower when the qualifications are completed abroad. In the United States, the returns to foreign education are lower at lower levels of education, but there is no difference in returns when it comes to tertiary education.

The dashed lines split the returns to foreign qualifications into EU27 and non-EU27 qualifications in Europe. Immigrants with EU27 qualifications have higher employment rates than immigrants with non-EU27 qualifications independently of the education level. The returns to completing higher levels of education are similar for all immigrants with foreign qualifications.

Figure 6.A1.2 in the annex presents the results for selected European OECD countries. As can be seen, the observed pattern is rather stable across countries.

Overqualification

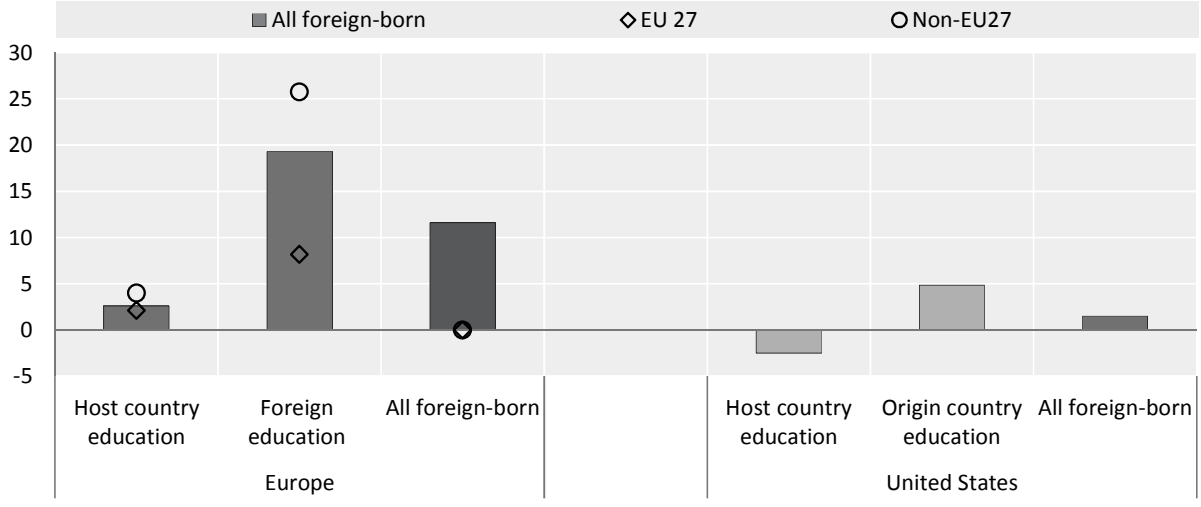
The second outcome considered in the analysis is whether individuals with tertiary education have access to jobs that correspond to their education level. The measure used

here is based on the classification of occupations into three skills levels using the ISCO classification.[11] An employed person is defined as being overqualified if he/she has a tertiary degree but is not working in a job that is ISCO-level 1-3, i.e. neither classified as a managerial nor as a professional/associate professional occupation.[12]

To which extent do the qualifications of immigrants and in particular foreign qualifications allow them to gain access to the most qualified jobs? Figure 6.13 presents the estimations comparing the overqualification of the native-born and immigrants with tertiary education. On average, immigrants have an overqualification rate that is 12 percentage points higher than that of native-born with the same characteristics in Europe, and 1.5 percentage points higher in the United States. However, the he average overqualification rate for the native-born is much higher in the United States than in Europe (29% and 19%, respectively).

Figure 6.13. The overqualification rate of the tertiary-educated foreign-born compared with the native-born

Differences in percentage points



Note: The sample has been restricted to employed tertiary-educated individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an overqualification dummy controlling for gender, five year age groups and years of education (and country fixed effects in Europe). The circles and diamonds in the left panel present the results for the EU27 and non-EU27 migrants, respectively.

Source: European countries: Labour Force Surveys, 2009-2010. United States: Current Population Survey, 2009-2011.

The higher overqualification rate of immigrants is driven almost entirely by immigrants with foreign qualifications, in particular by immigrants with non-EU27 qualifications in Europe. The differences among immigrant groups are large: immigrants with host-country qualifications have an overqualification rate that is 3 percentage points higher than the native-born in Europe; in the United States the overqualification rate of immigrants with host-country qualifications is even lower than that of the native-born, by 1.5 percentage points. In contrast, the overqualification rate compared with the native-born is 8 percentage points for immigrants with qualifications from another EU27 country and 26 percentage points for those with non-EU27 qualifications in Europe and 7 percentage points for all immigrants with foreign qualifications in the United States.[13]

As for the previous findings on the employment rate, independently of the origin of the qualification, immigrants from the European Union in Europe have slightly lower overqualification rates than comparable immigrants from other origins. The results are presented separately for men and women in Table 6.A1.4 in the annex. The overqualification rate for the tertiary-educated native-born in Europe is 19% for men and 20% for women. The difference between the native-born and all foreign-born is estimated at 9 percentage points for men and 14 percentage points for women. Both immigrant men and women have a much higher overqualification rate when the qualifications were acquired abroad. Immigrant men with qualifications from another EU country do not have significantly higher overqualification rates than immigrants with host-country qualifications, whereas the overqualification rate of women with qualifications from other EU countries is estimated to be 10 percentage points higher than that of comparable immigrant women with host-country qualifications. This result is similar to the one documented above with respect to the employment rates.

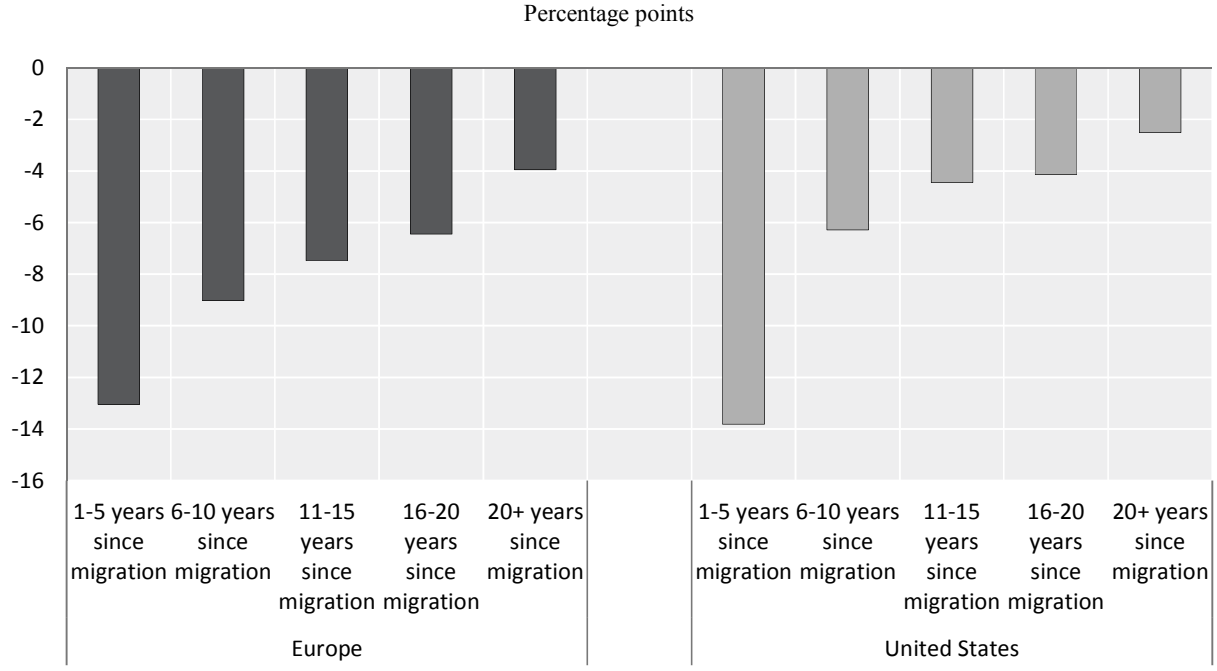
Table 6.A1.9 in the annex presents the results for the European countries individually. The pattern is remarkably stable across countries. Two findings stick out, however. The first is the particularly high degree of overqualification of immigrants with foreign education in the countries of Southern Europe and, for immigrants from the EU27, Ireland. A large part of these immigrants in the mentioned countries were recent labour migrants, who often came to meet lesser-skilled labour needs although many of them had tertiary education. The overqualification is also particularly high for tertiary-educated immigrants with a foreign degree from non-EU27 countries in the Scandinavian countries, where a large part of the migrants concerned came as humanitarian migrants who tend to face a higher likelihood of overqualification, as will be seen below.

Years spent in the host country for the foreign-educated immigrants

Immigrants of the most recent cohorts are more educated than those of previous cohorts when compared with native-born of the same age and gender living in the same country. This section compares the outcomes of the different cohorts of immigrants who arrive in the host country with completed education. We estimate similar specifications to those presented in Table 6.2 but restrict the sample of immigrants to those with foreign qualifications and split them by years in the host country in 5-year groups.

Figure 6.14 plots the estimated differences in the employment rates for immigrants of the different cohorts relative to the native-born, controlling forage, gender, *years of education* and country effects for Europe.[14] The pattern is clear: the employment rate of immigrants is higher for immigrants who have been longer in the country. In order to test for differential returns to education for different immigrant cohorts, we introduce the *years of education* interacted with the years of residence groups in the same estimation framework. The returns to years of education of the different cohorts are not significantly different, except for immigrants with 20 years of residence or more who have higher returns to education than more recent immigrants. A similar exercise with respect to overqualification shows no clear pattern regarding years of residence.

Figure 6.14. Differences in the employment rate between the foreign-born educated abroad and the native-born, by years of residence



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an employment dummy controlling for gender, five-year age groups and years of education (and country-fixed effects in Europe). The coefficients for this specification and for alternative specifications are presented in Table 6.A1.5 in the annex.

Source: European countries: Labour Force Surveys, 2009-2010. United States: Current Population Survey, 2009-2011.

Age at migration for immigrants educated in the host country

In this section, we investigate whether immigrants with host-country degrees have lower returns to education than the native-born. We split again immigrants into two groups, depending on the age they migrated. Table 6.3 presents estimations for the employment rate and Figure 6.15 for the overqualification rate.

In Europe, independent of the age at arrival, immigrants have lower employment rates controlling for years of education than the native-born. In the United States, only immigrants who arrived at the age of 15 and above have lower employment rates (column 1). However, in both regions the returns to education for immigrants who arrived in the host country aged 15 and more are much lower than those of immigrants arrived at an earlier age and than those of the native-born (column 2).

The patterns for tertiary-educated immigrants in terms of overqualification are somewhat different for immigrants in the two regions. In Europe, immigrants who arrived at age 15 or above and who have a host-country degree are more likely to be overeducated than the native-born, but this is not the case, on average, for immigrants having arrived at an earlier age.[15] In the United States, immigrants with host-country qualifications who migrated at 15 or older are less likely to be overeducated than similar native-born, whereas the overqualification rate of immigrants who arrived at an early age is not significantly different from that of the native-born.

Table 6.3. The employment rate of the foreign-born educated in the host country, by age at migration

Percentage points

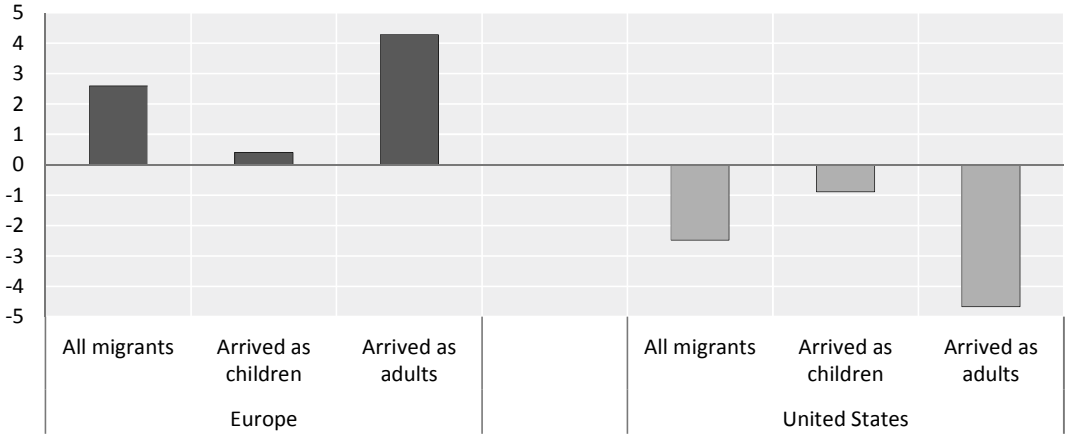
	Europe			United States	
	(1)	(2)	(3)	(1)	(2)
Arrived as a child	-5.29***	-1.05	-3.76*	1.77***	35.5***
	(0.338)	(1.64)	(1.98)	(0.483)	(2.98)
Arrived as an adult	-8.83***	17.6***	16.7***	-1.13*	49.2***
	(0.662)	(4.64)	(4.99)	(0.621)	(4.06)
Years of education	1.86***	1.87***	1.87***	4.03***	4.17***
	(0.0104)	(0.0104)	(0.0104)	(0.0361)	(0.0373)
Arrived as a child x Years of edu.		-0.216***	-0.163*		-1.78***
		(0.0803)	(0.0941)		(0.153)
Arrived as an adult x Years of edu.		-1.09***	-1.13***		-2.40***
		(0.182)	(0.198)		(0.186)
EU27			6.98**		
			(2.80)		
EU27 x Years of edu.			-0.103		
			(0.131)		
Robust standard errors in parentheses					
*** p<1%, ** p<5%, * p<10%					

Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an employment dummy controlling for gender, five year age groups and years of education (and country-fixed effects in Europe). All specifications include a constant.

Source: European countries: European Union Labour Force Survey, 2009-2010. United States: Current Population Survey, 2009-2011.

Figure 6.15. The overqualification rate of immigrants educated in the host country compared with the native-born, by age at migration

Differences in percentage points



Note: The sample has been restricted to employed tertiary-educated individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an overqualification dummy controlling for gender, five-year age groups and years of education (and country-fixed effects in Europe). All specifications include a constant.

Source: European countries: Labour Force Surveys, 2009-2010. United States: Current Population Survey, 2009-2011.

Migration category

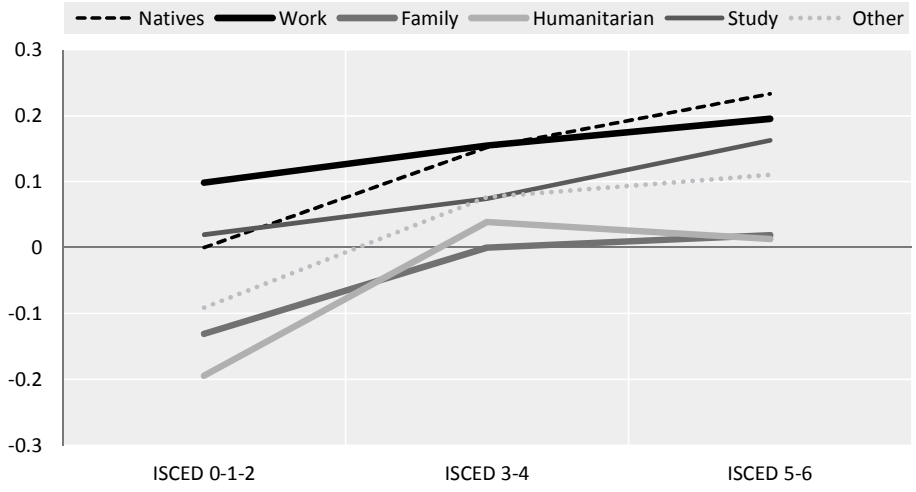
This last section analyses whether the differences in returns to education of the different groups of immigrants are driven by differences in returns to education for the different groups of immigrants, depending on their reason to migrate, for the European countries for which this information is available. Figure 6.16 plots the estimations of the differences in returns for the different groups in terms of employment, whereas Table 6.4 presents the estimations in terms of overqualification.

Immigrants who arrived for employment enjoy higher levels of employment than the native-born at lower levels of education but have lower returns to completing secondary and tertiary education. The employment rates of family and humanitarian migrants are much lower than those of the native-born or work migrants across all education levels and they have close to no returns to tertiary education.

The incidence of overqualification also differs significantly across immigrant entry category. Immigrants who immigrated for study have similar overqualification rates than the native-born whereas Immigrants who migrated for work or family reasons have significantly higher rates of overqualification. Humanitarian immigrants have the highest rates among all groups.

In the previous section, we documented that in Europe, immigrants with foreign qualifications – and in particular those with non-EU qualifications – have lower returns to education in terms of employment and job matching. Controlling for the immigrants' reason to migrate does not alter this pattern. Introducing differences in returns depending on the origin of the qualifications shows that the ranking in the overqualification rates among the groups remains the same and that the documented patterns with respect to the origin of qualifications are also not mainly driven by differences in terms of reason to migrate.

Figure 6.16. The employment rate as a function of the highest educational attainment, by migrant category



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an employment dummy controlling for gender, five year age groups, education levels and country fixed effects. The full estimations are available on request. The benchmark group is native-born with a low level of education (ISCED 0-2).

Source: Labour Force Survey ad-hoc module 2008.

Table 6.4. The incidence of overqualification and its association with the category of migration

Percentage points

	(1)	(2)	(3)	(4)	(5)	(6)
Foreign-born	12.7***	2.91***				5.21
	(0.746)	(1.10)				(14.0)
Work			18.0***	13.4***	14.7***	11.6***
			(1.37)	(2.39)	(2.37)	(2.49)
Family			23.2***	18.8***	19.1***	15.6***
			(1.58)	(2.31)	(2.27)	(2.61)
Humanitarian			34.2***	29.7***	30.3***	26.7***
			(3.87)	(4.29)	(4.28)	(4.64)
Study			-0.228	-1.17	0.408	-2.18
			(1.64)	(2.14)	(2.10)	(2.84)
Other			9.54***	3.10	3.23	
			(2.19)	(2.83)	(2.74)	
Foreign education		9.62***		3.62	2.54	2.93
		(219)		(2.70)	(2.65)	(2.66)
Non-EU27 education		15.3***		11.1***	11.3***	10.6***
		(2.84)		(3.41)	(3.37)	(3.35)
EU27		-3.12*		-8.52***	-9.41***	-9.26***
		(1.85)		(2.80)	(2.75)	(2.76)
Field of study					Yes	Yes
Field of study x Foreign-born					No	Yes
Robust standard errors in parentheses						
*** p<1%, ** p<5%, * p<10%						

Note: The sample has been restricted to employed tertiary-educated individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an overqualification dummy controlling for gender, five year age groups and country fixed effects.

Source: Labour Force Survey ad-hoc module 2008.

6.4. Selected issues in transferring qualifications from the country of origin to the host country

This section investigates two key elements that influence the use immigrants may make of their qualifications in the host countries: difficulties with the host-country language and, mainly for tertiary-educated immigrants, the recognition of their qualifications. Again, these data are only available for a number of European OECD countries.

Speaking the host-country language

The Eurostat 2008 ad-hoc module to the labour force survey asked immigrants whether they consider that their lack of host-country language skills constitutes a barrier to finding a job that matches their qualifications and work experience. The variable used in this section is a dummy variable that equals one if the individual answers positively, i.e. if he/she considers language difficulties to be an obstacle on the labour market. This is of course far from being an objective measure of language skills, but provides the point of view of the immigrant on his/her language skills and their adequacy for the host-country labour market.

Twenty-one percent of immigrants report that language difficulties are a main difficulty when finding a suitable job.[16] Immigrants with lower education levels are over-represented among this group. Controlling for the education level, it is mainly immigrants with foreign qualifications, and in particular immigrants with non-EU27 qualifications,

who report that language is a major difficulty for them. Among the different groups of immigrants by the reason of migration, humanitarian immigrants are the most likely to report language difficulties, followed by family migrants, the work migrants and finally migrants who declare having come to the host country for study. An estimation of a linear probability model of the available measure for immigrant language difficulties is presented in Table 6.A1.6 in the annex.

How do the labour market outcomes of immigrants who report language difficulties compare with the outcomes of other immigrants and with the native-born? Immigrants who report language difficulties also have lower returns to education in the labour market in terms of employment and overqualification.

Table 6.5 presents the coefficients from estimating differences in the employment rate between immigrants who declare to have language difficulties and those who do not. The employment rate is much lower for immigrants with self-reported language difficulties. Immigrants with different levels of education do not seem to experience this penalty differentially.[17] Controlling for the origin of the qualifications, the reason to migrate and the interactions of these variables with years of education does not alter the results significantly. Language difficulties are always negatively correlated with employment rates, independent of the entry category and the level and origin of the qualifications.

Table 6.5. The association between language difficulties and the employment rate of the foreign-born

Percentage points

	(1)	(2)	(3)
Foreign-born	7.44***	34.0***	
	(0.328)	(1.43)	
Years of education	1.59***	1.75***	1.74***
	(0.0202)	(0.0209)	(0.0210)
Years of edu. x Foreign-born		-1.38***	
		(0.0698)	
Language problems	-11.2***	-17.6***	-14.3***
	(0.842)	(3.26)	(3.43)
Years of edu. x Language problems		0.275	0.132
		(0.169)	(0.179)
Foreign education			-7.07
			(9.06)
Foreign edu. x Years of edu.			0.118
			(0.373)
Non-EU27 edu.			0.386
			(3.86)
Non-EU27 edu x Years of edu.			0.143
			(0.160)
EU27			8.37***
			(2.14)
Reasons to migrate		No	Yes
Reasons to migrate x Years of edu.		No	Yes
Robust standard errors in parentheses			
*** p<1%, ** p<5%, * p<10%			

Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an employment dummy controlling for gender, five year age groups and country fixed effects.

Source: Labour Force Survey ad-hoc module 2008.

Table 6.6 presents similar estimation results for the overqualification level of tertiary-educated immigrants. Controlling for demographic characteristics and country-fixed effects, immigrants who self-report language difficulties have overqualification rates that are 25 percentage points higher than immigrants who do not, and 35 percentage points higher than the native-born. Taking into account differences in the origin of the qualifications, the field of study and the reasons to migrate reduces the gap, but the incidence of overqualification remains nevertheless much higher for this group of immigrants. For labour migrants who do not report language difficulties, there are no longer significant differences in the overqualification rates vis-à-vis the native-born.

Table 6.6. The overqualification rate and language difficulties of the foreign-born

Percentage points

	(1)	(2)	(3)
Foreign-born	9.56***		5.52
	(0.814)		(10.7)
Language Problems	25.1***	18.7***	17.3***
	(2.18)	(2.38)	(2.37)
Foreign Education		2.18	1.87
		(2.70)	(2.69)
Non-EU27 Education		12.6***	12.0***
		(3.54)	(3.48)
EU27		-6.58**	-7.42**
		(2.94)	(2.90)
Work		10.1***	
		(2.61)	
Family		14.9***	3.44
		(2.57)	(2.14)
Humanitarian		28.9***	17.6***
		(4.51)	(4.45)
Study		-4.39*	-13.6***
		(2.41)	(2.60)
Other		-1.04	-12.3***
		(3.07)	(2.57)
Field of study	No	No	Yes
Field of study x Foreign-born	No	No	Yes
Robust standard errors in parentheses			
*** p<1%, ** p<5%, * p<10%			

Note: The sample has been restricted to employed tertiary-educated individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an overqualification dummy controlling for gender, five year age groups and country fixed effects. The third specification also includes controls for fields of study and an interaction term between field of study and foreign-born.

Source: Labour Force Surveys, ad-hoc module, 2008.

The recognition of foreign qualifications

Among immigrants with tertiary education in the European OECD countries for which data are available, 25% have applied to have their qualifications recognised in the host country. Taking into account differences in educational attainment, immigrants who came to the host country to study are much more likely to make use of the recognition procedures, suggesting that the recognition is mainly used for pursuing further studies in the host country, notably to get access to the tertiary education institutions. Far behind are immigrants who come for humanitarian or family reasons and then immigrants who come to work. Immigrants with foreign qualifications are more likely to apply for recognition if

their qualifications are from non-EU27 countries. Immigrants who have achieved their highest educational degree in the host country are more likely to have applied than immigrants who have a foreign qualification as their highest degree. There are also differences across fields of study. Immigrants now have qualifications in the domain of health and welfare are by far the most likely group to apply for recognition. Immigrants with this field of study are 16 percentage points more likely to have applied than those with the second most frequent field of study in terms of the likelihood to apply for recognition, namely teaching, training and education. The coefficients from linear probability models of the likelihood of applying for recognition by tertiary-educated immigrants are presented in detail in Table 6.A1.7 in the annex.[18]

Table 6.7 presents the estimated differences in overqualification rates between tertiary-educated immigrants who applied and those who did not apply for recognition. Compared with the native-born, immigrants who applied for recognition have an overqualification differential that is two-thirds lower than the one of immigrants who did not apply for recognition. Taking into account differences in the origin of qualifications, the reason of migration and the field of study does not alter this result substantially. Although there may still be positive selection among the immigrants who apply for recognition, the positive outcome of the immigrants who apply for recognition is thus not driven by the origin of the qualifications, the reason to migrate nor the field of study.

Table 6.7. The overqualification rate and the recognition of foreign qualifications

Percentage points

	(1)	(2)	(3)	(4)
Foreign-born	27.1***	18.9***		31.8**
	(1.39)	(3.58)		(13.8)
Recognition	-9.57***	-11.0***	-9.15***	-9.65***
	(2.20)	(2.31)	(2.23)	(2.31)
Foreign education		19.9		-1.71
		(4.07)		(4.23)
Non-EU27 education		20.0***		20.5***
		(5.53)		(5.96)
EU27		-9.30*		-7.33
		(5.01)		(5.58)
Work			26.4***	-15.9***
			(1.80)	(4.76)
Family			32.1***	-13.2***
			(2.18)	(4.87)
Humanitarian			45.2***	
			(4.42)	
Study			10.1**	-31.2***
			(4.19)	(6.35)
Other			16.6***	-29.6***
			(3.00)	(5.23)
Field of study	No	No	No	Yes
Field x Foreign-born	No	No	No	Yes
Robust standard errors in parentheses				
*** p<1%, ** p<5%, * p<10%				

Note: The sample has been restricted to employed tertiary-educated individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an overqualification dummy controlling for gender, five year age groups and country fixed effects.

Source: Labour Force Survey ad-hoc module 2008.

6.5. Conclusion

A number of important findings with implications for policy have emerged from this preliminary analysis. First, the patterns are similar for both the United States and for Europe and show in particular that in both regions, immigrants have on average fewer years of education than the native-born. This is driven by immigrants with foreign qualifications who are much less educated on average. Immigrants in the United States tend to have lower education levels than immigrants in Europe but in both regions, immigrants how have arrived more recently are higher educated than immigrants how have been resident in the country for longer. Immigrants who have arrived recently also have virtually the same number of years of education as native-born of the same age and gender living in the same country, particularly in Europe. This holds independent of origin countries and is a strong indication of a changing pattern of migration flows towards more qualified migration.

Second, foreign qualifications have a much lower value in the labour market then domestic ones, and their returns are lower than those of the native-born and of immigrants with host-country qualifications both in terms of employment and job quality. Again, the results are similar in Europe and the United States. In Europe, foreign degrees from non-EU countries are much more strongly discounted in the labour market than those from EU countries. Importantly, however, in both regions, host-country education seems to matter more for labour market outcomes than immigrant origin – both in terms of access to employment and in terms of job quality.

Third, humanitarian migrants have much more difficulties to get their qualifications valued in the labour market than other migrant groups. Labour migrants face fewer obstacles but still do not seem able to reach the returns to additional education than comparable native-born. These findings are not driven by differences in fields of study, as the fields of study are remarkably similar – both between immigrants and the native-born and also among different groups of migrants with tertiary education.

Fourth, part of the discount appears to be due to the lower language mastery of some migrants, which is associated with much poorer labour market outcomes. Indeed, labour migrants who report to master the host-country language well, one no longer finds a higher incidence of overqualification as for the native-born with the same characteristics. For observed penalty for lower language mastery of immigrants holds independent of the education level of the migrant. For both employment and job quality, language problems are a more important determinant than the origin of the qualification, which suggests that much could be gained by more investment into host-country language training. Finally, having one's foreign degrees formally recognised is associated with better jobs for the tertiary-educated. This result is highly robust and holds independent of migrant category and field of study. This provides tentative evidence that recognition may to be a promising way of tackling employer uncertainty about the true value of foreign degrees. Countries could thus gain from facilitating and promoting recognition of foreign degrees. The presumably best return, however, could be obtained by investing more into bridging offers which provide immigrants with host-country degrees, which seem to be even more highly valued by employers than formally recognised foreign ones.

Notes

1. The terms "immigrant" and "foreign-born" are thus used synonymously throughout the chapter.

2. While formal qualifications are a close proxy of skills, the two are not the same, for a number of reasons (see OECD 2011). First, qualifications only reflect skills learnt in formal education and certified Training. Second, at each qualification level, student performance varies significantly and so does field of study. Evidence from surveys that intend to measure skills has also shown that the performance of education systems various greatly across countries. Third, skills learnt on the job through labour market experience are not measured; and finally, some of the skills reflected in formal qualifications may deteriorate over time if un-used or not kept up-to-date.

3. However, two recent publications by the OECD provide overviews in international comparison – Widmaier and Dumont (2011) and OECD (2012a).

4. To this end, we construct – for immigrants not in full-time education – a variable that compares the year of migration and the year the highest qualification was obtained, to estimate whether the education was completed in the host country or the origin country. The year of migration is calculated using the years of residence in the host country. For European countries, Eurostat provides the years of residence for immigrants as a continuous variable only for the first ten years and then in 5 year intervals. It is nevertheless possible to determine where the highest diploma was obtained for approximately 90% of immigrants (for whom the years of residence and the year of graduation are available). For immigrants for whom the year of graduation is missing, we use the information on the highest degree obtained and transform it into an approximate age at graduation. The variable is then constructed for 85% of all immigrants out of full-time education. In the CPS, the year of graduation is not available. The highest degree obtained is translated into an average age at which the individual left education. The translation of the education level into years of education and the construction of the origin of the highest degree in the CPS follow the constructions in Bratsberg and Ragan (2002). In both the EU-LFS and the CPS, the year of migration is available in intervals (mainly two-year intervals). It is possible to estimate the origin of the highest qualification obtained for 92% of the immigrants who are not in full-time education.

5. The years of education are constructed using the year of graduation minus seven. Note that this proxy suffers from several shortcomings, since the school starting age is not the same in all countries. In addition, grade repeats – which are sizeable in numbers in some countries – are counted as additional years of education. Finally, the same years of education are not necessarily associated with the same formal levels of qualification, in particular in some European countries where secondary and tertiary education takes longer to complete.

6. The coefficients of the estimation are presented in Table 6.A1.1 in the annex.

7. The field of education is not available in the Current Population Survey.

8. By doing so, years since migration may be interpreted as years potentially spent in the host-country labour market.

9. Belgium is not included in any of the estimations using the variable "years since migration" since there is a problem with the coding of the variable in the European Union Labour Force Survey (EU-LFS).

10. Note that this does not necessarily correspond to the formal entry category, although the two tend to be identical for most migrants. There is no similar information for the United States in the CPS. This section uses only EU-LFS data for countries who implemented the ad-hoc module on migration in 2008 in their national labour force survey.

11. For a discussion of this and other possible ways to measure overqualification, see Quintini (2011).

12. Managers of small enterprises were excluded.

13. We also ran the model separately with controls for differences in the overqualification with respect to field of study, by introducing dummies for field of study and interactions with the foreign-born dummy, hence accounting for differences between immigrants and the native-born in the overqualification rate across fields of study. Although field of study has a high explanatory power of the overqualification rate, the differences between immigrants and the native-born and among the different groups of immigrants remain practically unchanged. Given the close resemblance of the fields of study (see Figure 6.6 above), both between native-born and immigrants and within immigrant groups, this result is of course not necessarily surprising.

14. Controlling also for different returns to education for the native-born and immigrants does not alter the results. The coefficients of the different specifications are presented in Table 6.A1.5 in the annex.

15. As in the estimations above, introducing field of study and an interaction term between immigrant and field of study does not change the coefficients significantly.

16. The non-response rate to this question is nevertheless high (28%).

17. This result may be due to controlling for education using the years of education instead of education levels. However, the sample used is too small to find significant differences between education levels.

18. Further separating the results for EU and non-EU migrants provides some tentative indications that the latter benefit more from recognition. The differences are, however, not statistically different because of the small sample sizes involved. The results are available upon request.

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Annex 6.A1

Supplementary tables and figures

Table 6.A1.1. Educational attainment levels and association with origin of the education

Years of education

Europe												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Years edu.	Years edu.	Higher-sec.	Higher-sec.	Lower-sec.	Lower-sec.	Primary	Primary	Tertiary	Tertiary	MSc/PhD	MSc/PhD
Foreign-born	-0.812***	1.231***	0.0505***	-0.0665***	0.104***	-0.0136***	0.0736***	-0.0164***	-0.0430***	0.0673***	0.00664***	0.0783***
	(0.0190)	(0.0372)	(0.00171)	(0.00366)	(0.00186)	(0.00353)	(0.00132)	(0.00172)	(0.00163)	(0.00356)	(0.00147)	(0.00330)
EU27		-0.436***		0.00391		-0.0153***		-0.00382		-0.00450		-0.00755
		(0.0623)		(0.00635)		(0.00569)		(0.00274)		(0.00623)		(0.00578)
Foreign education		-1.428***		0.108***		0.0675***		0.0739***		-0.105***		-0.0747***
		(0.0617)		(0.00635)		(0.00598)		(0.00341)		(0.00621)		(0.00574)
Non-EU27 education		-1.636***		0.0761***		0.146***		0.0872***		-0.0662***		-0.0526***
		(0.0778)		(0.00766)		(0.00755)		(0.00454)		(0.00748)		(0.00692)
United States												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Years edu.	Years edu.	Higher-sec.	Higher-sec.	Lower-sec.	Lower-sec.	Primary	Primary	Tertiary	Tertiary	MSc/PhD	MSc/PhD
Foreign-born	-1.581***	0.249***	0.0761***	-0.0458***	0.213***	0.0421***	0.155***	0.0103***	-0.0761***	0.0458***	0.00256	0.0507***
	(0.0205)	(0.0268)	(0.00243)	(0.00435)	(0.00217)	(0.00295)	(0.00175)	(0.00156)	(0.00243)	(0.00435)	(0.00156)	(0.00306)
Foreign education		-2.835***		0.187***		0.263***		0.226***		-0.187***		-0.0765***
		(0.0375)		(0.00500)		(0.00403)		(0.00294)		(0.00500)		(0.00343)
Robust standard errors in parentheses												
*** p<0.01, ** p<0.05, * p<0.1												

Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The coefficients show the differences between the respective immigrant groups and the native-born in years of education and the likelihood to have the mentioned qualification levels, the controlling for gender and five year age groups (and country fixed effects in Europe) resulting from an ordinary least squares regression. The difference is first estimated for all foreign-born and then for the foreign-born split by the origin of their highest qualification.

Source: European countries: Labour Force Surveys 2009-2010. United States: Current Population Survey 2009-2011.

Figure 6.A1.1. Years of education of the foreign-born compared with the native-born, by gender



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The bars represent the estimated differences in *years of education* controlling for gender and five year age groups (and country fixed effects in Europe) resulting from an ordinary least squares regression. The difference is first estimated for all foreign-born and then for the foreign-born split by the origin of their highest qualification.

Source: European countries: Labour Force Surveys 2009-2010. United States: Current Population Survey 2009-2011.

Table 6.A1.2. Education-related determinants of the employment rate, by gender

	Women							Men						
	Europe				United States			Europe				United States		
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(1)	(2)	(3)	(4)	(1)	(2)	(3)
Foreign-born	-0.117***	0.00487	0.0348*	0.0129	-0.0993***	0.322***	0.198***	-0.0637***	0.0257***	0.0506***	0.0305	0.0409***	0.676***	0.535***
	(0.00254)	(0.00978)	(0.0208)	(0.0213)	(0.00342)	(0.0169)	(0.0358)	(0.00235)	(0.00980)	(0.0184)	(0.0189)	(0.00304)	(0.0154)	(0.0299)
Years of education		0.0236***	0.0236***	0.0236***		0.0425***	0.0425***		0.0145***	0.0145***	0.0145***		0.0413***	0.0414***
		(0.000154)	(0.000154)	(0.000154)		(0.000544)	(0.000546)		(0.000142)	(0.000142)	(0.000142)		(0.000511)	(0.000512)
Foreign-born x Years of edu.		-0.00562***	0.00544***	-0.00528***		-0.0196***	-0.0111***		-0.00414***	0.00465***	-0.00433***		-0.0318***	-0.0254***
		(0.000505)	(0.000975)	(0.000974)		(0.000878)	(0.00178)		(0.000487)	(0.000848)	(0.000849)		(0.000784)	(0.00146)
Foreign education			0.178***	0.146***			0.177***			0.0174	-0.00402			0.167***
			(0.0301)	(0.0304)			(0.0377)			(0.0267)	(0.0268)			(0.0314)
Foreign edu. x Years of edu.			0.00801***	-0.00816***			-0.0126***			0.000300	-1.76e-05			-0.00748***
			(0.00150)	(0.00150)			(0.00191)			(0.00125)	(0.00125)			(0.00157)
Non-EU27 edu.			-0.210***	-0.156***						-0.0141	0.0274			
			(0.0254)	(0.0270)						(0.0240)	(0.0253)			
Non-EU27 edu. x Years of edu.			0.00459***	0.00459***						0.00336***	-0.00337***			
			(0.00135)	(0.00135)						(0.00120)	(0.00120)			
EU27				0.0539***							0.0415***			
				(0.00928)							(0.00788)			

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The numbers represent the estimated differences between the respective immigrant groups and the native-born in terms of the employment rate (1 corresponds to 100%), controlling for gender and five-year age groups resulting from an ordinary least squares regression.

Source: European countries: Labour Force Surveys 2009-2010. United States: Current Population Survey 2009-2011.

Table 6.A1.3. Education-related determinants of the employment rate

	Europe				United States		
	(1)	(2)	(3)	(4)	(1)	(2)	(3)
Foreign-born	-0.0907***	-0.0309***	-0.0563***	-0.0718***	-0.0279***	0.227***	0.182***
	(0.00174)	(0.00501)	(0.0132)	(0.0133)	(0.00230)	(0.00788)	(0.0199)
Foreign-born x ISCED2		-0.00271	0.0217	0.0234		-0.0600***	-0.0376
		(0.00621)	(0.0147)	(0.0146)		(0.0101)	(0.0231)
Foreign-born x ISCED3+4		-0.0404***	0.0140	0.0132		-0.216***	-0.157***
		(0.00571)	(0.0138)	(0.0138)		(0.00871)	(0.0209)
Foreign-born x ISCED5		-0.0778***	-0.000930	0.0219		-0.288***	-0.209***
		(0.00593)	(0.0138)	(0.0188)		(0.00872)	(0.0207)
Foreign-born x ISCED6		-0.0611***	-0.0308	-0.000310		-0.251***	-0.214***
		(0.0135)	(0.0194)	(0.0137)		(0.0140)	(0.0249)
Foreign education			0.134***	0.104***			0.0507**
			(0.0168)	(0.0170)			(0.0200)
Foreign education x ISECD2			-0.0655***	-0.0669***			-0.0202
			(0.0199)	(0.0199)			(0.0240)
Foreign education x ISCED3+4			-0.144***	-0.144***			-0.0732***
			(0.0182)	(0.0181)			(0.0214)
Foreign education x ISCED5			-0.169***	-0.170***			-0.106***
			(0.0186)	(0.0185)			(0.0213)
Foreign education x ISCED6			-0.149***	-0.149***			-0.0393
			(0.0296)	(0.0296)			(0.0295)
Non-Eu27 education			-0.128***	-0.0826***			
			(0.0121)	(0.0132)			
Non-Eu27 education x ISCED2			0.0322**	0.0323**			
			(0.0157)	(0.0157)			
Non-Eu27 education x ISCED3+4			0.0528***	0.0528***			
			(0.0142)	(0.0142)			
Non-Eu27 education x ISCED5			0.0246	0.0246			
			(0.0153)	(0.0153)			
Non-Eu27 education x ISCED6			0.0471	0.0470			
			(0.0473)	(0.0473)			
EU27				0.0451***			
				(0.00538)			
Constant	0.408***	0.248***	0.249***	0.249***	0.159***	0.0241***	0.0263***
	(0.00424)	(0.00443)	(0.00444)	(0.00444)	(0.00409)	(0.00534)	(0.00535)
Observations	4,728,454	4,712,635	4,671,388	4,671,388	359,641	359,641	354,533
R-squared	0.151	0.191	0.193	0.193	0.077	0.127	0.127

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The numbers represent the estimated differences between the respective immigrant groups and the native-born in terms of the employment rate (1 corresponds to 100%) controlling for gender and five-year age groups resulting from an ordinary least squares regression.

Source: European countries: Labour Force Surveys 2009-2010. United States: Current Population Survey 2009-2011.

Table 6.A1.4. Education-related determinants of the overqualification rate for the tertiary-educated

A. By gender

	Women						Men					
	Europe				United States		Europe				United States	
	(1)	(2)	(3)	(4)	(1)	(2)	(1)	(2)	(3)	(4)	(1)	(2)
Foreign-born	0.141***	0.0297***	0.0381***	0.0358***	0.0211***	-0.00797	0.0941***	0.0235***	0.0305***	0.0464***	0.00776	-0.0438***
	(0.00586)	(0.00721)	(0.00736)	(0.00891)	(0.00528)	(0.00811)	(0.00573)	(0.00751)	(0.00754)	(0.00887)	(0.00613)	(0.00922)
Foreign education		0.213***	0.102***	0.0978***		0.0549***		0.126***	0.000385	0.0373**		0.0929***
		(0.0112)	(0.0152)	(0.0181)		(0.0104)		(0.0110)	(0.0136)	(0.0175)		(0.0119)
Non-EU27 education			0.167***	0.173***					0.184***	0.131***		
			(0.0178)	(0.0232)					(0.0162)	(0.0227)		
EU27				0.00622						-0.0533***		
				(0.0151)						(0.0161)		
Constant	0.782***	0.775***	0.778***	0.778***	0.348***	0.349***	0.803***	0.802***	0.807***	0.808***	0.264***	0.268***
	(0.0535)	(0.0536)	(0.0536)	(0.0536)	(0.0697)	(0.0694)	(0.0833)	(0.0833)	(0.0833)	(0.0833)	(0.0686)	(0.0684)
Observations	437,754	433,757	433,286	433,286	76,412	75,342	381,174	377,706	377,164	377,164	63,441	62,550
R-squared	0.048	0.055	0.056	0.056	0.009	0.009	0.045	0.048	0.049	0.049	0.012	0.013

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

B. By detailed education levels

	Europe					United States		
	(1)	(2)	(3)	(4)		(1)	(2)	(3)
Foreign-born	0.140***	0.0348***	0.0463***	0.152**	Foreign-born	0.0410***	0.00681	0.0539**
	(0.00396)	(0.0127)	(0.0129)	(0.0768)		(0.00385)	(0.00583)	(0.0246)
ISCED 5A	-0.244***	-0.247***	-0.246***	-0.241***	Foreign education		0.0610***	0.0302
	(0.00272)	(0.00279)	(0.00279)	(0.00274)			(0.00752)	(0.0309)
ISCED 6	-0.342***	-0.320***	-0.320***	-0.288***	Associate degree academic	-0.0543***	-0.0541***	-0.0530***
	(0.00394)	(0.00413)	(0.00413)	(0.00419)		(0.00628)	(0.00632)	(0.00665)
					Bachelor	-0.205***	-0.205***	-0.203***
Foreign-born x ISCED 5A		0.0140	0.0220	0.0179		(0.00502)	(0.00504)	(0.00531)
		(0.0138)	(0.0137)	(0.0163)	Master	-0.367***	-0.367***	-0.362***
						(0.00520)	(0.00523)	(0.00550)
Foreign-born x ISCED 6		-0.0333**	-0.0363**	-0.0429**	Professional school	-0.433***	-0.432***	-0.433***
		(0.0154)	(0.0152)	(0.0196)		(0.00623)	(0.00627)	(0.00659)
					PhD	-0.453***	-0.449***	-0.438***
Foreign education		0.197***	0.124***	0.0954***		(0.00616)	(0.00622)	(0.00680)
		(0.0182)	(0.0245)	(0.0283)				
					Associate degree academic x Foreign-born			0.00709
		-0.0163	-0.0466*	-0.0176				(0.0318)
Foreign education x ISCED 5A		(0.0201)	(0.0261)	(0.0317)	Bachelor x Foreign-born			-0.0626**
								(0.0261)
		-0.166***	-0.109***	-0.0655**	Master x Foreign-born			-0.0512*
Foreign education x ISCED 6		(0.0226)	(0.0258)	(0.0303)				(0.0268)
					Professional school x Foreign-born			-0.0447
Non-EU27 education			0.0980***	0.126***				(0.0283)
			(0.0285)	(0.0361)	PhD x Foreign-born			-0.0704***
								(0.0269)
			0.0561*	0.0157				
Non-EU27 education x ISCED 5A			(0.0298)	(0.0405)	Associate degree academic x Foreign edu.			-0.0446
								(0.0408)
			-0.0560	-0.0913**	Bachelor x Foreign edu.			0.0582*
non-EU27 education x ISCED 6			(0.0349)	(0.0450)				(0.0328)
					Master x Foreign edu.			0.0110
EU27			-0.0267**	-0.0284				(0.0338)
			(0.0106)	(0.0252)	Professional school x Foreign edu.			0.0735*
								(0.0398)
Field of study x Foreign-born				Yes	PhD x Foreign edu.			-0.0135
				Yes				(0.0346)
Constant	0.806***	0.802***	0.806***	0.792***	Constant	0.400***	0.402***	0.400***
	(0.0465)	(0.0465)	(0.0465)	(0.0531)		(0.0491)	(0.0489)	(0.0491)
Observations	818,928	811,463	810,450	794,913	Observations	139,853	137,892	137,892
R-squared	0.110	0.116	0.117	0.145	R-squared	0.094	0.094	0.094
Robust standard errors in parentheses					Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1					*** p<0.01, ** p<0.05, * p<0.1			

Note: The sample has been restricted to tertiary-educated individuals aged 15-64 and not in full-time education. The numbers represent the estimated differences between the respective immigrant groups and the native-born in terms of the incidence of overqualification (1 corresponds to 100%) controlling for gender and five-year age groups resulting from an ordinary least squares regression. For the United States, the baseline educational degree is "Associate degree occupational/vocational".

Source: European countries: Labour Force Surveys 2009-2010. United States: Current Population Survey 2009-2011.

Table 6.A1.5. The employment rate of the foreign-born and association with years of residence

	Europe			United States	
	(1)	(2)	(3)	(1)	(2)
Foreign-born	-0.0372***		0.0291**	0.0868***	0.430***
	(0.00487)		(0.0123)	(0.00499)	(0.0162)
1-5 years since migration	-0.0916***	-0.0149	-0.0594***	-0.184***	
	(0.00652)	(0.0102)	(0.00836)	(0.0110)	
6-10 years since migration	-0.0510***	0.0214**	-0.00994	-0.0729***	0.0929***
	(0.00656)	(0.00981)	(0.00833)	(0.00757)	(0.0110)
11-15 years since migration	-0.0364***	0.0332***	-0.00479	-0.0494***	0.115***
	(0.00814)	(0.0108)	(0.00972)	(0.00724)	(0.0108)
16-20 years since migration	-0.0261***	0.0440***		-0.0378***	0.121***
	(0.00830)	(0.0109)		(0.00815)	(0.0115)
20+ years since migration		0.0611***	0.0134		0.144***
		(0.00919)	(0.00864)		(0.0106)
Years of education	0.0182***	0.0188***	0.0188***	0.0335***	0.0420***
	(0.000108)	(0.000106)	(0.000106)	(0.000317)	(0.000376)
Years of edu. x Foreign-born		-0.00595***	-0.00737***		-0.0281***
		(0.000476)	(0.000575)		(0.000681)
EU27			0.121***		
			(0.0187)		
Years of edu. x EU27			-0.000871		
			(0.000964)		
Constant	0.117***	0.107***	0.107***	-0.363***	-0.496***
	(0.00471)	(0.00470)	(0.00471)	(0.00609)	(0.00674)
Observations	4,205,514	4,205,514	4,202,639	337,466	337,466
R-squared	0.180	0.181	0.182	0.116	0.122
Robust standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The numbers represent the estimated differences between the respective immigrant groups and the native-born in terms of the employment rate (1 corresponds to 100%) controlling for gender and five-year age groups resulting from an ordinary least squares regression.

Source: European countries: Labour Force Surveys 2009-2010. United States: Current Population Survey 2009-2011.

Table 6.A1.6. The determinants of language difficulties

	(1)	(2)
Men	-0.00887	-0.00872
	(0.00831)	(0.00902)
Years of education	-0.00543***	-0.00454***
	(0.000860)	(0.00118)
Family	0.0480***	
	(0.0101)	
Humanitarian	0.0938***	
	(0.0230)	
Study	-0.0277*	
	(0.0156)	
Other	-0.0290**	
	(0.0148)	
Foreign education	0.0957***	
	(0.0213)	
Non-EU27 education	0.0213	
	(0.0240)	
EU27	-0.0158	
	(0.0224)	
Teacher training and education science		-0.0161
		(0.0257)
Humanities, languages, arts		-0.0430**
		(0.0179)
Social sciences, business, law		-0.0302**
		(0.0144)
Sciences		-0.00103
		(0.0195)
Engineering		-0.0275*
		(0.0145)
Agriculture, veterinary		0.0309
		(0.0362)
Health and welfare		-0.0583***
		(0.0187)
Services		-0.0133
		(0.0202)
Constant	0.334***	0.285***
	(0.0209)	(0.0272)
Observations	39,454	31,287
R-squared	0.055	0.045
Country fixed effects	Yes	Yes
Age groups fixed effects	Yes	Yes
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The numbers represent the estimated likelihood to have language difficulties (1 corresponds to 100%) resulting from an ordinary least squares regression controlling for five-year age groups.

Source: Labour Force Survey ad-hoc module 2008.

Table 6.A1.7. The determinants of applying for diploma recognition

	(1)	(2)
Men	-0.0365***	-0.0396***
	(0.00805)	(0.0121)
Years of education	0.0171***	0.0155***
	(0.000787)	(0.00182)
Family	0.0400***	
	(0.00936)	
Humanitarian	0.0383**	
	(0.0171)	
Study	0.222***	
	(0.0330)	
Other	0.0668***	
	(0.0157)	
Foreign education	-0.148***	
	(0.0446)	
Non-EU27 education	0.0793	
	(0.0545)	
EU27	0.0438	
	(0.0541)	
Teacher training and education science		0.129***
		(0.0379)
Humanities, languages, arts		0.0857***
		(0.0266)
Social sciences, business, law		0.0556***
		(0.0187)
Sciences		0.0427
		(0.0271)
Engineering		0.0519***
		(0.0169)
Agriculture, veterinary		0.0115
		(0.0381)
Health and welfare		0.293***
		(0.0281)
Services		0.0264
		(0.0241)
Constant	-0.100**	-0.116***
	(0.0406)	(0.0397)
Observations	29,166	20,933
R-squared	0.131	0.097
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The numbers represent the estimated likelihood to have applied for recognition of a foreign degree (1 corresponds to 100%) resulting from an ordinary least squares regression controlling for five-year age groups. The reference group for the field of study is persons with "general studies".

Source: Labour Force Survey ad-hoc module 2008.

Table 6.A1.8. Years of education of the foreign-born compared with the native-born in European countries

	All foreign-born	Host country education EU27	Host country non-EU27	Foreign education EU27	Foreign education non-EU27
Austria	-0.57**	1.76**	-0.05**	0.87**	-1.79**
Belgium	-1.75**	0.36**	1.41**	-0.65**	-4.08**
Bulgaria	1.94**	4.73**	1.3**	1.25	2.25**
Cyprus[1,2]	-0.27**	1.56**	1.92**	-0.12	-0.96**
Czech Republic	0.02	0.43**	1.2**	-0.42**	0.27
Denmark	1.24**	2.33**	0.65**	2.28**	1.40**
Estonia	0.03	0.08	0.64**	-0.44	-1.02**
Finland	1.38**	0.28	1.45**	-2.4**	-2.48**
France	-1.22**	0.06	1.22**	-2.25**	-3.09**
Germany	-2.05**	0.17**	-0.96**	-2.3**	-3.71**
Greece	-1.35**	1.74**	0.34**	-0.4**	-2.02**
Hungary	1.06**	2.08**	3.23**	0.62**	0.87**
Iceland	-0.8**	0.00**	0.00**	0.00**	0.00**
Ireland	0.87**	1.16**	3.19**	0.26**	1.57**
Italy	-0.74**	0.53**	1.03**	-0.32**	-1.57**
Latvia	0.27**	-0.16	1.08**	-0.74	-0.52**
Lithuania	0.23**	0.01	0.71**	-0.27	-0.18
Luxembourg	-0.27**	0.22	0.76**	-0.47**	-0.09
Netherlands	-1.49**	1.57**	1.14**	-2.6**	-4.94**
Norway	-0.25	1.67**	0.71**	0.07	-1.73**
Poland	0.74**	0.40	0.42**	0.81	0.18
Portugal	1.86**	2.46**	3.92**	1.71**	0.97**
Romania	2.78**	1.33	2.94**	4.44**	2.69**
Slovak Republic	0.55**	0.68**	3.34**	-0.17	0.75**
Slovenia	-1.11**	0.09	1.23**	-0.13	-2.52**
Spain	-0.45**	0.91**	1.79**	0.15	-1.09**
Sweden	-1.18**	0.72**	0.64**	-0.49**	-2.59**
Switzerland	-1.79**	0.71**	-0.17**	-1.63**	-2.93**
United Kingdom	0.78**	1.67**	2.32**	0.58**	0.08

** p<0.05.

Note: The sample has been restricted to tertiary-educated individuals aged 15-64 and not in full-time education. The numbers represent the estimated differences between the respective immigrant groups and the native-born in terms of years of education controlling for gender and five-year age groups resulting from an ordinary least squares regression. The difference is first estimated for all foreign-born and then for the foreign-born split by the origin of their highest qualification.

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: Labour Force Surveys 2009-2010.

Table 6.A1.9. Overqualification rate of the tertiary-educated foreign-born compared with the native-born in European countries

	Host country education EU27	Host country non-EU27	Foreign education EU27	Foreign education non-EU27
Austria	-0.01	0.05	-0.02	0.26**
Belgium	0.04	0.06**	-0.01	0.22**
Bulgaria	-0.24**	0.02	-0.20**	0.26
Cyprus[1,2]	0.01	0.06	0.22**	0.37**
Czech Republic	-0.02	0.27**	-0.01	0.38**
Denmark	0.02	0.03	0.08	0.34**
Estonia	0.05	0.17**	-0.15**	0.34**
Finland	0.07	0.00	0.08	0.33**
France	0.00	0.04**	0.04	0.34**
Germany	0.07	0.09	0.01	0.21**
Greece	0.08**	0.28**	0.34**	0.66**
Hungary	-0.03	0.01	-0.02	0.08
Ireland	0.01	-0.06**	0.19**	0.1**
Italy	0.06	0.15**	0.23**	0.63**
Latvia	-0.03	0.06	0.01	0.14
Lithuania	0.00	0.05	-0.15**	0.25**
Luxembourg	0.02	0.05	0.02**	0.09**
Netherlands	-0.01	0.03	0.11**	0.24**
Norway	-0.02	0.04	0.09**	0.35**
Poland	-0.04	-0.06	0.03	0.26
Portugal	0.02	0.06**	0.24**	0.57**
Romania	0.07	0.25**	0.20	0.22
Slovak Republic	-0.08**	0.15	-0.10**	0.01
Slovenia	0.06	0.01	0.09	0.04
Spain	0.00	0.00	0.23**	0.32**
Sweden	0.03**	0.05**	0.19**	0.43**
Switzerland	-0.04**	0.03	-0.07**	0.08**
United Kingdom	0.01	0.03	0.08**	0.06**

** p<0.05.

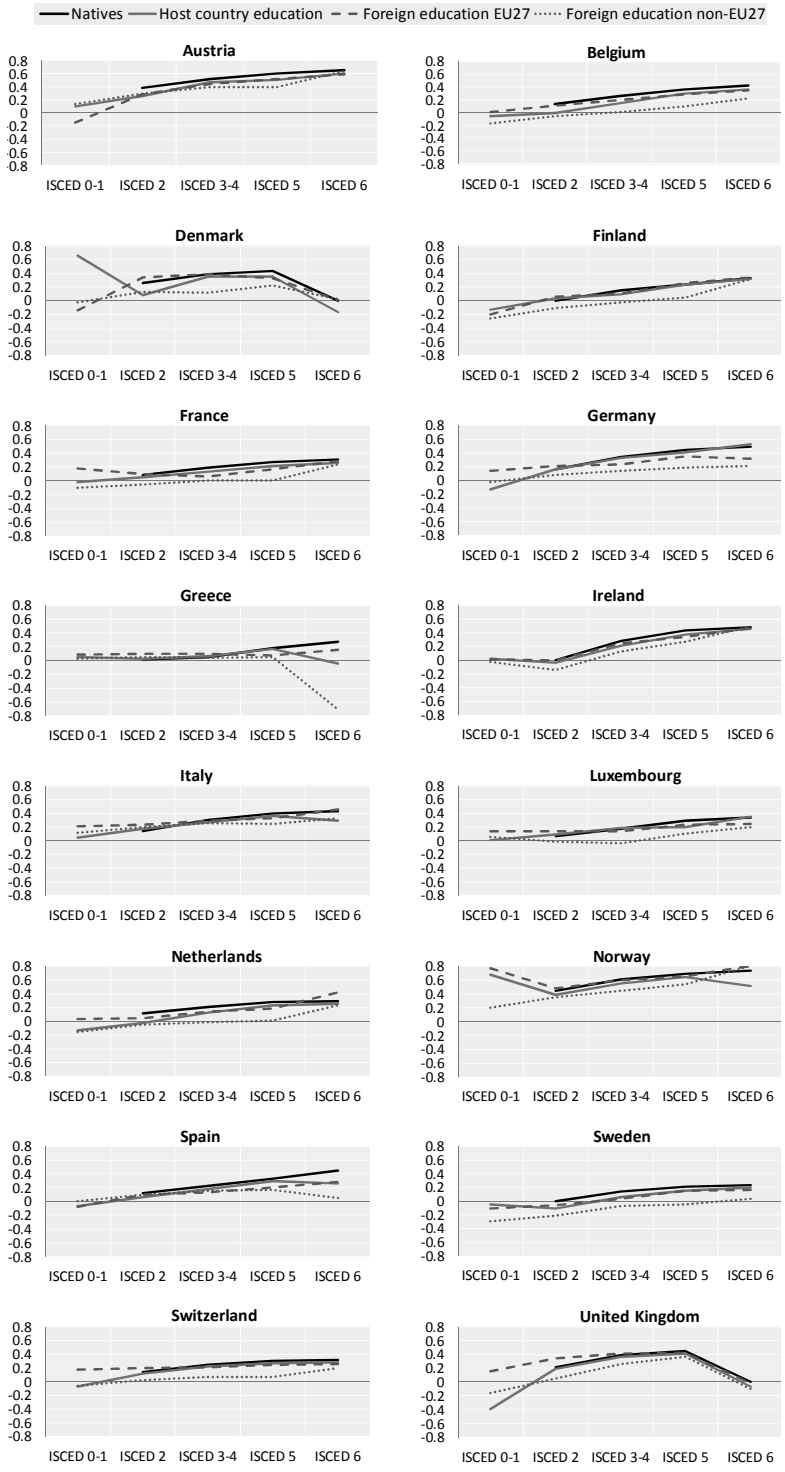
Note: The sample has been restricted to tertiary-educated individuals aged 15-64 and not in full-time education. The numbers represent the estimated differences between the respective immigrant groups and the native-born in terms of the likelihood of being overqualified (1 corresponds to 100%) controlling for gender and five year age groups resulting from an ordinary least squares regression. The difference is first estimated for all foreign-born and then for the foreign-born split by the origin of their highest qualification.

1. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: Labour Force Surveys 2009-2010.

Figure 6.A1.2. The employment rate as a function of the highest educational attainment in selected European OECD countries



Note: The sample has been restricted to individuals aged 15-64 and not in full-time education. The coefficients are estimated from a linear regression of an employment dummy controlling for gender and five year age groups.

Source: European countries: Labour Force Surveys, 2009-2010.

Chapter 7

The international portability of migrant human capital: Canadian experiences

Arthur Sweetman
McMaster University, Department of Economics, Canada[1]

Post-migration skill utilisation is fundamental to the successful economic integration of immigrants in a receiving country. Essential to the process are both the role of diverse economic actors in influencing skill relevance and credential/qualification recognition, and the growing understanding that the value of certain skills (e.g., education) in the labour market is conditional on the presence of other skills (e.g., receiving country language ability) together with the incorporation of this understanding into policy. This chapter explores recent developments in Canada, focusing primarily on immigrant selection policy related to skill portability. Canada is in the midst of a major reform of its immigrant selection system that is strongly influenced by a desire to facilitate skill portability leading to labour market success, and which seems to align with recent research findings. However, unanticipated responses to public policy initiatives are common, and there is a need to monitor ensuing developments to ensure that the observed changes in outcomes align with the policy goals.

7.1. Introduction

Immigrant success in a receiving country's labour market is to a large extent determined by the degree to which human capital's cognitive and non-cognitive elements are "portable". Portability concerns the relevance, and utilisation of pre-migration skills in the post-migration society, especially its labour market. Notably, the degree of skill transfer is influenced by the actions of a variety of stakeholders. These include immigrants themselves, both individually and collectively, as well as the joint actions of many individuals, organisations and institutions within the receiving country's labour market, government and broader society.

A closely related issue is foreign credential/qualification recognition, where it is beneficial for both immigrants and the receiving country population (especially employers) to understand which credentials and qualifications are equivalent, or not equivalent, to those common in the receiving country labour market. This is not straightforward. Also, other skills – such as literacy in the receiving country's language – may mediate the value of educational skills in the labour market.

Limitations in the portability of human capital by immigrants are sometimes attributed to either the supply (e.g., immigrant) or demand (e.g., employer) sides of the labour market. However, it is fruitful to interpret the observed outcomes as reflecting an equilibrium, although a simple supply and demand model is not adequate. There are many economic actors beyond employers and (immigrant) workers, with institutions and organisations – such as unions, regulatory colleges, professional associations, educational institutions, credentialing bodies, and of course government – playing especially important roles in constraining the observed equilibrium. Given the wide range of relevant actors, there is room for policy – not only government policy, but also that of other institutions – to influence the equilibrium.

This chapter explores recent developments in Canadian immigration policy that are relevant to skill portability, with a particular focus on immigrant selection. It also relates these policy changes to selected pertinent academic research evidence. An appreciable set of policy changes have occurred in the past decade or so, and while the associated changes in outcomes will only become known over the coming decades, it is worth considering their motivations and policy goals.

One problem in policy development is that forecasting (understanding) the impact of a particular policy change on the full range of relevant outcomes, in the short and long term, is not always possible. Unintended consequences abound, including overshooting the mark. Follow-up, both monitoring and more in-depth analyses, on an ongoing basis is therefore essential. In the past few years Canada has, for example, seen policies regarding immigrant selection introduced that subsequent monitoring has shown quite quickly to be having impacts sufficiently different from what was intended that further changes were introduced quite rapidly.

One illustrative example of a rapid alteration in policy involves an effort to deal with a longstanding problem in Canadian immigration selection: far too many applications relative to the target intake. Until recently there was a political unwillingness to address the gap resulting in a substantial backlog (or "inventory") of applicants. On November 29, 2008, ministerial instructions were issued establishing occupational screens whereby only those in 38 specified "in-demand occupations" were permitted to apply in the economic class's skilled worker programme unless the applicant had arranged employment or was residing legally in Canada as a foreign student or temporary

foreign worker for at least a year.[2] However, instead of reducing the number of applications by preventing potential immigrants in many non-listed occupations from applying, the occupational listing appears to have been interpreted as an encouragement for applications in those categories. Quotas on each category were therefore introduced and the number of occupations reduced to 29 effective June 26, 2010, and on July 1, 2011 the quotas were further reduced. On July 1, 2012 a "pause" in the acceptance of new applications to the skilled worker programme was announced during which many in the backlog were processed while others had their applications returned without processing. In this example, an effort to improve skill portability (and/or skill targeting via occupational selection) was combined with an effort to solve a different administrative problem – excess applications leading to long processing times caused not by slow administration but by the annual targets. Although the discussion in this chapter focuses on skill portability, as in this example it is frequently only one aspect of a larger and more complex set of interacting aims/motivations. In many cases, however, the broader context will not be addressed in this discussion. Nevertheless, some context is necessary for interpretation.

In Section 7.2 a brief synopsis of the Canadian context is presented in order for readers to understand the motivations for some of the policy changes discussed. For readers familiar with Canadian immigration institutions and policy this section may be omitted. Section 7.3 addresses the portability focusing on three distinct aspects of skills that are central to labour market outcomes: first, the changing bundle of characteristics associated with altering source countries, with a particular focus on language; second, the declining economic rate of return to pre-migration labour market experience; and third, issues related to the economic rate of return to pre-migration education and qualifications. Section 7.4 addresses the interactions between skills, suggesting that outcomes are best considered as following from collections or baskets of skills embodied in individuals, rather than particular skills operating independently. In this context, the portability of one skill may depend upon the presence (or absence) of a quite different one. Section 7.5 concludes.

7.2. The Canadian context

To understand Canadian experiences with immigrant human capital portability, it is necessary to have a basic understanding of the context. Over the past several years, there have been a large number of legislative, regulatory, policy and procedural changes regarding immigrant selection and some changes regarding the provision of settlement services although this discussion focuses mostly on the former. In large part, these are a response to both declining labour market outcomes for new immigrants and simultaneous calls from employers for the immigration system to provide workers with specific skills. Allied with this is an effort to reduce the concentration of new immigrants in particular cities, and to serve regional labour market demands. Most of these changes are either directly relevant to, or indirectly influence, skill portability. Evidence, history, and elements of the recent debate are presented from an economic perspective by Beach et al. (2011), Ferrer, Picot, and Riddell (2012), Picot and Sweetman (2012, 2005), and Aydemir and Skuterud (2005).

A preeminent feature of Canada's permanent immigration system is its scale. With an intake of approximately 0.7 or 0.8% of the population annually, it is about two times larger than the rate in the United States (including most estimates of undocumented workers), and is comparable in magnitude to Australia's.[3] Canada also has a substantial

and in the last decade growing temporary resident programme, with the number of temporary residents in the country in 2012 equaling about four times the permanent flow. About 45% are temporary foreign workers (TWFs), 30% students, 11% humanitarian, and almost 14% are classified as "other" according to Citizenship and Immigration Canada (2012, p. 53). However, the visa label reflects the primary reason for being in Canada, and many beyond the TFW category would have permission to work. As will be discussed, in recent years a number of new bridges have been built between the temporary and permanent migration flows (beyond traditional pathways such as refugee/humanitarian flows and the live-in-caregiver programme).

Closely associated with the size of the flow is the highly structured and managed nature of immigrant selection. Although there are only four main immigrant classes – economic, family, refugee, and other – there are numerous sub-categories as can be seen in Table 7.1. To interpret this table, it's necessary to understand the priority accorded to various categories and sub-categories in processing. For example, within the family class, spouses and partners are given priority in processing such that parents and grandparents effectively become a residual given the annual target for family class as a whole. A call to increase the size of the family class is, therefore, effectively advocating for an increase in the parents and grandparents sub-category. This does not mean that the parents and grandparents sub-category is not amenable to policy – for example, the target admission level for the family class has recently been increased so as to essentially temporarily double the flow of parents and grandparents in order to, together with a pause on the receipt of new applications, reduce a backlog in the sub-category – but the administrative priority given to various sub-categories needs to be understood in order to interpret the operation of the system. Similarly, for example, within the economic class provincial nominees are processed with priority relative to those in the skilled worker category, and ministerial instructions have been used to prioritise applicants according to various well defined criteria.

Understanding the distinction between principal applicants, and their spouses and dependants, is also crucial to comprehending the operation of the system. While health and criminal background checks apply to all individuals, the criteria of the immigration selection system apply only to principal applicants. So, for example, the points system associated with the skilled worker programme is only applied to each principal applicant, with each family choosing which member will serve as the principal applicant (and usually choosing the male). There are personable suitability points in the current version of the system for the characteristics of a spouse/partner, but they are awarded to the principal applicant.

One of the effects of the reforms of the last decade is that the system is far more complex than it was previously, especially since the Provincial (and Territorial) Nominee Program is actually an amalgam of roughly 60 separate provincial/territorial programmes operated by all provinces except Québec. It commenced as an extremely small flow of individuals in the mid to late 1990s, but expanded rapidly in the 2000s. Further, the skilled worker numbers presented in Table 7.1 are actually the sum of two distinct programmes: first, the federal programme which includes those intending to reside in all provinces except Québec, and, second, a separate but associated programme that operates in Québec and admits immigrants intending to reside in that province. Of course, once an immigrant arrives in Canada she or he has rights with respect to geographic mobility and the intended destination is far from perfectly correlated with the subsequent location of residence.

Table 7.1. Immigration to Canada by class, 2012

Category		Count	Percentage of permanent residents	Percentage of class
Family class				
Spouses and partners		39 533	15.3	60.8
Sons and daughters		2 715	1.1	4.2
Parents and grandparents		21 815	8.5	33.6
Others		945	0.4	1.5
Subtotal		**65 008**	25.2	100.0
Refugees				
Government-assisted refugees		5 430	2.1	23.5
Privately sponsored refugees		4 220	1.6	18.3
Refugees landed in Canada		8 586	3.3	37.2
Refugee dependants		4 858	1.9	21.0
Subtotal		**23 094**	9.0	100.0
Economic class immigrants				
Canadian Experience Class	- principal applicants	5 943	2.3	3.7
	- spouses & dependents	3 416	1.3	2.1
Skilled workers	- principal applicants	38 601	15.0	24.0
	- spouses & dependents	52 868	20.5	32.9
Entrepreneurs	- principal applicants	127	0.0	0.1
	- spouses & dependents	352	0.1	0.2
Self-employed	- principal applicants	89	0.0	0.1
	- spouses & dependents	153	0.1	0.1
Investors	- principal applicants	2 616	1.0	1.6
	- spouses & dependents	6 742	2.6	4.2
Provincial/territorial nominee	- principal applicants	17 200	6.7	10.7
	- spouses & dependents	23 699	9.2	14.7
Live-in caregivers	- principal applicants	3 690	1.4	2.3
	- spouses & dependents	5 322	2.1	3.3
Subtotal		**160 819**	62.4	100.0
Other				
DROC and PDRCC*		4	0.0	0.0
Temporary resident permit holders		67	0.0	0.7
Humanitarian and compassionate cases		2 928	1.1	32.7
Other humanitarian and compassionate cases		5 962	2.3	66.5
Subtotal		**8 961**	3.5	100.0
Category not stated		**5**	0.0	100.0
Total		**257 887**	100.0	100.0

Note: At July 1, 2012, Statistics Canada estimated Canada's population to be 34 754 300 which implies a 0.74% permanent immigration rate.

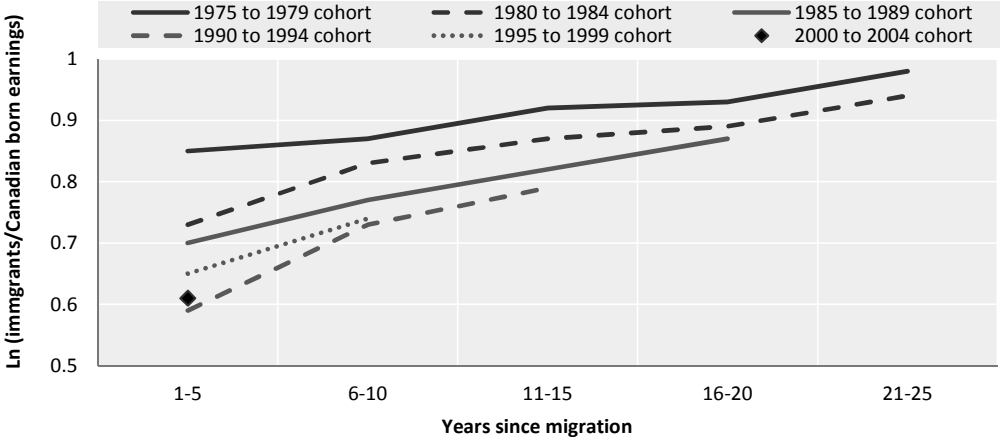
* Deferred Removal Order Class and Post-determination Refugee Claimants in Canada.

Source: Citizenship and Immigration Canada, *Facts and Figures*, 2012.

Since the the late 1980s immigrant intake in family and refugee classes has remained roughly constant (except for an appreciable spike up during the recession in the early 1990s), but it has slowly shrunk as a percentage of the total permanent migrants flow.[4] In contrast, the economic class has expanded in absolute numbers and as a percentage of all immigrants.[5] This increase in both the number and share of skilled applicants, and the concurrent increase in high-skilled (highly educated) immigrants has rendered issues of skill portability ever more crucial.

Perhaps most crucially as regards skill portability, since the 1970s and 1980s Canada has seen a marked decline in the economic outcomes of new immigrants. This is illustrated in Figure 7.1 for full-time males, but similar plots for all workers and females (not presented) look remarkably similar with one exception. Plots not controlling for characteristics such as age and education show smaller gaps in general (since immigrants are more likely to, for example, be university graduates than the Canadian born), and across cohorts there are (mostly) better outcomes for those arriving subsequent to the late 1990s when new immigrants' educational attainment and share in the economic class trended up. In the late 1970s, upon arrival new immigrants' earnings were just over 85% of comparable Canadian born workers. With years in the country, their earnings then increased relative to those of the Canadian born (and, in this time frame, they are the only cohort to surpass the Canadian born if statistical controls for characteristics are removed). However, subsequent arrival cohorts saw their relative earnings at entry decline.[6] Simultaneously, poverty rates increased for immigrants but declined for the Canadian born.[7] This decline in annual earnings and the concomitant increase in poverty rates have been well studied, as surveyed in the references listed above, and issues of skill portability are central to many of the proximate sources of the decline identified. The section turns now to three specific issues thus identified, before turning to recent work looking at interactions among such factors.

Figure 7.1. Declining immigrant annual earnings across entry cohorts



Note: The average earnings of various entry cohorts of immigrants as a function of years since migration relative to those of comparable Canadian-born, full-time full-year male workers aged 16 to 64. Predictions from an econometric model.

Source: Various censuses of Canada, adapted from Picot, G. and A. Sweetman (2012), *Making It in Canada: Immigration Outcomes and Policies,* Institute for Research on Public Policy, Montreal.

7.3. Aspects of skill portability central to labour market outcomes

Human capital portability is influenced by a wide variety of issues including labour market conditions in the receiving country, especially at the time of arrival. For example, immigrants who arrive in the expansionary phase of the business cycle appear to find skill portability easier than do those who arrive during or shortly after a recession, prompting calls such as that from Picot and Sweetman (2012) for a return to a procyclical intake policy. On a different "macro" issue reflecting the labour market, Hou and Picot (2014) observe that immigrant labour market outcomes vary as a function of the size of the arrival cohort of which they are a part (statistically controlling for state of the business cycle at entry). A 10% increase in an entering cohort's size is associated with a 0.8% decline in entry earnings for men, and a 0.3% decline for women. Centrally for this analysis, several drivers of the decline in the market outcomes for new immigrants have been identified, three broad areas of which are directly related to human capital portability. It is on this set that this chapter focuses, first introducing the relevant economic evidence and then discussing relevant policy and process changes.

Changing source countries (and domestic language)

Although there are ongoing changes in immigrant source countries, the most significant shift followed Canada's move away from a "preferred nation" immigration selection policy and the introduction of the points system in 1967, which had its most substantial impact in the 1970s and 1980s. Associated with changing source countries is a bundle of characteristics including changes in the sending countries' language, culture, occupational structure, the quality of educational outcomes, workplace technology norms, and the like. It is very difficult to objectively disentangle this bundle, which are simultaneously determined.

There is (in my view) convincing evidence regarding the existence of ethnic discrimination by employers (e.g., Oreopoulos, 2011), however there is also evidence (e.g., Schaafsma and Sweetman, 2001) that the relationship is not simple. Potentially, acculturation or some similar mechanism also plays an important role since, on average, immigrants who are what in Canada are termed "visible minorities" have declining labour market outcomes as a function of, especially, age at immigration (holding other observable characteristics constant). Moreover, as observed by Aydemir and Sweetman (2008), and Finnie and Mueller (2010), with some exceptions for those who arrive just before the end of high school, in almost all ethnic groups Canadian immigrants in the so-called 1.5 generation (those who arrive as children and obtain their education in Canada) have both educational outcomes that are commonly above (sometimes much above) the norms of the third generation and subsequent labour market outcomes that are similar to or above Canadian norms.[8] Plausibly, while ethnic discrimination by employers and others exists and has something to do with visible appearance or other similar markers, it also in part reflects an ability to navigate the Canadian labour market that is influenced by language skills, Canadian education, an understanding of local social norms, and the like. Relatedly, it is recognised that there is appreciable heterogeneity across ethnic groups in labour market outcomes (e.g., Pendakur and Pendakur 1998) and educational attainment (e.g., Finnie and Mueller 2010). But, although newly arrived ethnic groups may deviate from past patterns, historically there is also evidence of intergenerational convergence in education and earnings as observed by Dicks and Sweetman (1999).

In terms of government policy, it has long been recognised that a crucial element of immigration-responsive policy is the need to address the resulting increase in ethnic diversity. Although there are many precursors, in Canada federal multiculturalism policy, centered on a legislative initiative, was most clearly articulated starting in 1971. This, not coincidentally, followed the massive 1967 revision to immigration policy and practice that included the introduction of the points system in part with a goal of substantially increasing the ethnic diversity of the immigration flow. Much federal and provincial legislation and policy regarding human rights, antidiscrimination, and multiculturalism have followed. This is not primarily focused on immigrants, but on the receiving/domestic populace and especially employers. In terms of the new immigrants, however, settlement policy, and the provision of settlement services including free/subsidised Canadian official language (i.e., English and/or French) training, training with respect to societal integration, and job search assistance are central to the acculturation process and to skills portability.

Although it is difficult to separately identify the bundle of issues associated with changing source country, much research and policy attention has focused on the central role of domestic language skills (recognising that language may also proxy other characteristics and skills). Almost universally, language has come to be viewed as central to immigrant skill portability. Many studies, such as Beach, Green, and Worswick (2011), include measures of self-reported English/French language knowledge and show that there is an important relationship with labour market outcomes. However, an important precursor to a discussion of language is the recognition that self-reported language ability is an error prone measure. Using various combinations of the Ontario Immigrant Literacy Survey, the International Adult Literacy Survey, and the Adult Literacy and Life Skills Survey, all of which have very substantial Canadian sample sizes and direct measures of literacy, Ferrer, Green, and Riddell (2006), and Bonikowska, Green and Riddell (2008) illustrate the value of language skills formally assessed on a common metric for labour market outcomes. They also show there are substantial economic returns to literacy skills in the labour market and that these are statistically indistinguishable for the Canadian born and immigrants. However, the distribution of English/French literacy scores for immigrants is lower for immigrants than the Canadian born.

A large number of policy changes with respect to language have occurred in the last 10 to 15 years. The foundational policy/legislative change of the current era was the introduction of the Immigration and Refugee Protection Act (IRPA) in 2002, which raised the share of points allocated for language from 13 to 24%. More recently, several equally important changes have occurred including, adding a language pre-screen prior to the points system for skilled workers (and as a screen for the Canadian Experience Class discussed below). Previously, poor language skill points could be counterbalanced by high scores in other dimensions for skilled worker principal applicants. Also, fluency in one language was effectively treated as equivalent to a modest knowledge of both English and French. While the points system still operates, there is now a distinction between an immigrant-selected first (more points) and second official language, in addition to language now having the aforementioned independent threshold. Perhaps even more importantly, language skills were previously assessed in a nonstandard manner, whereas currently language is universally tested according to a standardised benchmark for skilled worker principal applicants in some economic categories. Though only briefly summarised here, these are extremely important changes to the immigrant selection process. Clearly, both researchers and government policy makers now view language as the central predictor of post-migration labour market and social outcomes.

The economic rate of return to pre-migration labour market experience

For the last few decades in Canada there has been a small to zero, or even a negative, economic rate of return to immigrants' average (potential) pre-migration labour market work experience as noted by Schaafsma and Sweetman (2001).[9] That the economic value of these skills has effectively declined to zero represents a very substantial economic loss for migrants to Canada and is a central issue of skills portability. Aydemir and Skuterud (2005) estimate that the decline in the return to pre-migration experience is responsible for between one quarter and one half of the overall decline in entry earnings. Making an allied observation, Green and Worswick (2010) point out that this contrasts with the substantial rate of return to general work experience for the Canadian born. Moreover, they point out that this return increased for the Canadian born (as did, it appears, the return for post-migration experience for new immigrants) following a marked decline in outcomes for new labour market entrants in the 1980s. That is, the increase in the return follows mostly from a decline in the base rather than an increase at the high end. The decline in entry earnings for all new entrants to the labour market, they demonstrate, is one of the reasons for the decline in entry earnings for new immigrants. For the most part, new arrivals, regardless of age and pre-migration experience, are treated by the labour market as new labour market entrants and thus experienced a decline in earnings.

Aydemir and Skuterud (2005) divide the immigrant population into four groups based on gender and whether the individual was from a "traditional" or "non-traditional" source country. They observe that the rate of return to pre-migration work experience has declined for all four groups, and it only remains positive for males from traditional source countries.

Goldmann, Sweetman, and Warman (2011) using longitudinal data following a particular entry cohort for four years from the early 2000s, observe that on average the rate of return to pre-migration experience is negative. However, they extend the analysis to look at pre-and post-occupational matching and observe a substantial increase in labour market earnings for those immigrants who match occupations – a group for which pre-migration experience is expected to matter. Oddly however, while there is a very substantial benefit to matching occupations, for the sample as a whole there is no difference in the value of obtaining such a match among those with varying degrees of pre-migration experience. Econometrically, achieving an occupational match is associated with an intercept shift, but those with more or less pre-migration experience in the relevant post-migration occupation see no difference, on average, in their earnings. Of course, there are important sample selection issues regarding who does, and does not, attain an occupational match. Further, when they allow for interactions with language ability, and in a result broadly consistent with that of Aydemir and Skuterud, they observe that males who both match their occupation and have substantial English language skills do obtain a positive, although modest, rate of return to their pre-migration work experience. This appears to be the only group to do so.

From a policy perspective, there have been substantial swings with respect to the treatment of pre-migration occupational experience. Prior to the reforms of 2002, occupational experience was part of the point system, with points assigned for experience in occupations in demand. However, for administrative reasons as well as its negligible predictive power for labour market outcomes, occupational experience was removed with the introduction of the IRPA.[10] The emphasis shifted towards a long-term model based more on language and educational credentials, as opposed to a short-term "occupations-in-demand" model. More recently, pre-processing occupational criteria were reintroduced

to the skilled worker programme in the form of screens whereby individuals without work experience in selected "in-demand" occupations were not able to apply (with the two exceptions discussed in the introduction together with other context). Given demands from employers, and other measures of current and future labour market needs, there is substantial pressure on government to select immigrants based on occupational human capital.

New approaches to immigrant selection attempting to address labour market demands have also been introduced. First, in the mid-1990s the Provincial Nominee Program (PNP) was instituted in large part to allow provincial governments, which are assumed to be closer to local labour markets, to attract immigrants in response to regional demands. Carter et al. (2010) report, however, that while Manitoba's Provincial Nominee Program initially attempted to target occupational shortages it moved away from doing so quite quickly given their rapid fluctuations. A large number of provinces allocated a significant portion of their quota to individuals where employers had a substantial input in selection. Frequently, these individuals had pre-migration Canadian labour market experience as temporary foreign workers. Overall, although results are preliminary given that the programme is relatively new and changing as it expands, Pandey and Townsend (2013) suggest that PNP appears to be successful in promoting a greater regional distribution of new immigrants even if targeting shortages remains difficult.

Second, in part emulating existing programmes in Australia and/or New Zealand, the federal government introduced the Canadian Experience Class, which recognises, in one stream, legal Canadian work experience (frequently as a temporary foreign worker), and in a second stream, Canadian post-secondary educational credentials combined with post-graduation Canadian work experience while on a temporary visa. Background information on these programmes can be found, for example, in Pandey and Townsend (2013), and Sweetman and Warman (2010a, 2010b). Increasingly, employers have been given substantial input in immigrant selection, with a key issue being to leverage their credential recognition/evaluation capabilities and to increase the portability of immigrant human capital with respect to pre-migration labour market experience (and education, as will be discussed in the next sub-section). In the case of the Canadian Experience Class, although Canadian employment is key to initiating the application, the potential immigrant must also meet language requirements and normal health, security and related screens. There are debates about providing employers with too much input in immigrant selection following from the fundamental differences between the long-term view of society, and the short-term one of employers. However, if initial conditions have long-run consequences, then the advantages provided in employers choosing whom to hire as temporary foreign workers may be quite important.

Qualification recognition/portability turns out to be particularly difficult for workers in the skilled trades, and the federal government has recently introduced a new Skilled Trades Program that relies to a large extent on employers and/or regulatory bodies to validate qualifications in advance of migration. One requirement is that immigrants must "have an offer of full-time employment for a total period of at least one year or a certificate of qualification in that skilled trade issued by a provincial or territorial body" (Citizenship and Immigration Canada website, www.cic.gc.ca, consulted February 2014).

The approach with respect to skilled trades – in requiring a connection with an employer and/or a regulatory body – exemplifies a more general approach increasingly being undertaken by the federal government in immigrant selection. Much effort has gone into providing more information pre-migration, and directing potential immigrants to

appropriate credentialing bodies (which are almost entirely under provincial, not federal, jurisdiction) in advance of being admitted as permanent residents. The goal is to improve labour market outcomes at entry and to speed up the economic integration of new arrivals. Of course, while this is relevant for foreign work experience, it is equally so for educational credentials discussed in the next section.

However, before addressing education and qualifications, it's useful to look at work experience from an alternative perspective. For any given level of education, increasing the quantity of pre-migration work experience implies that the immigrants' age at immigration is increasing. Therefore, the decline in the rate of return to pre-migration labour market experience can simultaneously be interpreted as a growing penalty associated with immigrating at older ages. Schaafsma and Sweetman (2001) suggest that for adult immigrants there is a gradual decline up until ages in the mid-30s, after which the rate of decline in labour market outcomes with increasing age at immigration becomes steeper. In response to evidence of this type, and also with a (modest) demographic rationale, the points for age within the skilled workers points system have been modified to emphasize youth.[11]

The economic rate of return to pre-migration education and qualifications

The valuation of immigrant education in the Canadian labour market is a complicated topic. Augmenting the average education levels of new immigrants together with facilitating educational/credential/qualification recognition has been a centerpiece of relevant federal and provincial governments' policies and processes for several years with respect to improving the labour market outcomes of new immigrants – for an overview, see Albaugh and Seidle (2013). This double-barreled approach targets both immigrants and the receptor capacity of the nation. In fact, the emphasis on credential recognition started in a period when there had been no appreciable decline in the rate of return to education for new immigrants. As observed by Aydemir and Skuterud (2005) using data from 1966 to 2000, a gap did (and does) exist in the rate of return to education between immigrants and the Canadian born, but the gap was relatively stable and was not an appreciable cause of the decline in entry earnings. However, policy to increase education levels among new arrivals and also improve their rate of return to education may alleviate the declining labour market outcomes of new migrants even if it is not a cause of that problem.

At the same time that credential recognition was being addressed, the size of the economic class was increased, and within the class the average level of education was also increased appreciably. For principal applicants in the skilled worker stream the latter was accomplished largely by increasing the points allocated for education. During this period of increasing average educational attainment of new immigrants, the earnings advantage *at entry* of post-secondary educated immigrants within this class declined relative to the earnings of those with lower levels of education. Plausibly, the increasing share of the flow with high levels of education meant that to make it through the points system individuals with low levels of education, a declining share of the flow, had a very high probability of already having a job offer pre-migration in order to obtain sufficient points to qualify. This gave them an initial advantage in the labour market and facilitated skill portability. However, post-migration earnings growth among those with higher education increases much more rapidly such that there is a substantial gap several years after landing.[12]

A very particular decline in the rate of return to education occurred in the early 2000s. In the preceding years, a substantial emphasis had been put on high-skilled immigrants in engineering and information technology occupations. This was in large part in response to demands from employers, but it also recognised the historic high level of success experienced by this group and that their skill portability was less contentious than in some fields. As documented by Picot and Hou (2009) the so-called "IT bust" of the mid-2000s had a very strong negative impact on labour market outcomes of this cohort of highly educated immigrants with very specific skills, and frequently quite poor language skills that hindered flexibility in shifting to alternative occupations and/or entrepreneurship. This policy episode highlights the aforementioned fundamental differences of perspective between employers and society. Governments cannot "layoff" permanent resident/citizens, and the perspective of government needs to include both the short- and long-term. The episode also points to concerns regarding government policy "overshooting". While placing some emphasis on this particular skill category did make sense, the scale of the effort was disproportionate to the risks involved.

On a different note, foreign qualification recognition for new immigrants has received much popular and media attention, with a particular focus on regulated professions. Like much regarding economic return to education, the picture here is quite complicated. Li and Sweetman (2013) point to international test scores (e.g., the OECD Programme for International Student Assessment or PISA, and its Programme for the International Assessment of Adult Competencies or PIAAC) that illustrate dramatic differences in educational outcomes across countries, and they find that for immigrants who arrive as adults the rate of return to education in the Canadian labour market is correlated with source country average test scores. That is, immigrants from countries with higher quality education systems receive, on average, a higher rate of return to education in the Canadian labour market. Moreover, both Bonikowska et al. (2008) and Ferrer et al. (2006) find that economic rates of return to measured skills (as opposed to credentials obtained in various countries) is statistically indistinguishable between immigrants and the Canadian born. Focusing on regulated health professions, Owusu and Sweetman (2013) observe that the pass rate among foreign trained professionals writing licensing exams is dramatically below that for the Canadian trained.

Several policies have been pursued in response to these issues. First, credential evaluation is commencing as part of the immigrant selection process for skilled worker principal applicants. Previously, although credential verification (to detect fraud) may have been undertaken, broadly speaking all post-secondary qualifications with the same years of study were viewed as equivalent. In the new model, an understanding of (non-) equivalencies between foreign and Canadian qualifications is being built into the selection system. Second, as mentioned with respect to foreign work experience, the federal government has increased its provision of pre-migration information and is encouraging, and sometimes requiring, potential immigrants in regulated professions to have their qualifications verified prior to processing for permanent residency. Third, employers are being given a larger role in immigrant selection, which to some extent implies their evaluating immigrant/employee credentials as part of the hiring process. Fourth, there has been an increased emphasis on educational bridging programmes that recognise foreign education and seek to address gaps relative to Canadian norms so that pre-migration education is not lost but rather made useful by the addition of complementary educational inputs.[13] Fifth, regulatory bodies in many jurisdictions have been under increasing pressure to ensure that their processes are not biased against immigrants. In four provinces "Fairness Commissioners" (so named in some

jurisdictions) have been established with mandates to investigate regulatory bodies and recommend changes to ensure that processes and requirements are providing public protection but not protectionism.

7.4. Interactions between skills affect portability

As foreshadowed, for example regarding occupational matching, recent research has started to understand the empirical importance of the interrelationships between the various skills possessed by new immigrants. Building on the analysis discussed earlier, Ferrer, Green and Riddell (2006) note that immigrants have a lower rate of return to education than the Canadian born, and also have lower literacy skills than the Canadian born. However, once literacy skills – as measured by formal tests – are controlled for statistically, the rate of return to education is statistically indistinguishable between the two. That is, individuals with the same level of literacy received the same rate of return to education, and the observed lower rate of return to education is "explained" by lower English/French literacy skills. Goldmann, Sweetman, and Warman (2011) similarly find that language skills mediate the rate of return to education. For both males and females the observed low rate of return to education can be seen as reflecting distinct rates of return within a heterogeneous population. Those with very low language skills effectively receive a zero rate of return on their education, and the rate of return to education increases with the level of language skills in the remainder of the population. Those with high levels of language skills receive high rates of return to education (in addition to a direct contribution to earnings from the language skills themselves).

Historically, Canada's points system treated each skill or attribute independently, but more recent research provides evidence suggesting that the empirical magnitude of the interactions among various sets of skills is non-ignorable. Advanced education, in the absence of appropriate language skills, has little value in the receiving labour market. In response to this type of research, selection policy has been altered in some classes so that higher education levels need higher language skills to pass the required threshold. This approach operationalises the relevant research.

Much more broadly, Canada is in the midst of developing an "expression of interest" selection process akin to that employed in New Zealand, and introduced recently in Australia. Although the details have not been announced, it seems likely that selected streams of the economic class will be deemed to be subject to this approach. In general terms, potential immigrants express an interest in immigrating; the government then ascertains that they meet particular minimum standards, where, in the realm of skills, language is central. Employers, and the provincial and federal governments, may subsequently nominate immigrants from this pool of pre-screened individuals. Employers will use their hiring processes that consider the interactions of various skills and attributes embodied in individuals and relevant for productive contributions in the labour market. Governments may choose those they think most in demand in the labour market. It remains to be seen how this concept will work in practice in the Canadian context. From an employer's point of view, this stream will compete with non-expression of interest immigration pathways and they may find other approaches preferable. It remains to be seen whether, and to what degree, changes will be made to alternative pathways once the expression of interest approach is introduced.

7.5. Conclusion

Canada has undertaken, and is undertaking, a broad set of major policy reforms with respect to immigrant selection, and is also making some changes regarding settlement and the reception capacity of the host society, in an effort to improve immigrant labour market outcomes and maximise the value of immigration for both the nation and new immigrants. This survey has focused primarily on selection issues, although settlement-side initiatives such as the introduction of Fairness Commissioners in some provinces, and foreign credential/qualification recognition initiatives more broadly, may have important implications for particular sub-sets of new arrivals.

Many of the policies being introduced directly or indirectly target not only the portability of human capital, so as to better address domestic labour market needs, but also the assessment of various skills (especially English and French ability) and educational credentials. Moreover, many of these policies explicitly recognise the interactions among various types of skills, and especially the crucial role of language in mediating elements of human capital portability.

Overall, these policies are in accord with the findings of the empirical, especially economic, research literature in the sense that they can be seen as attempts to address issues highlighted by various academic and think tank research efforts. Of course, as illustrated in the introduction, unanticipated responses to public policy initiatives are common and there is a need to monitor ensuing developments to ensure that the observed changes in outcomes align with the policy goals. Although technically challenging, there is also a need to recognise that almost all empirical immigration research in Canada focusses on the economic well-being of immigrants (economic integration), whereas the Canadian Immigration and Refugee Protection Act (http://laws.justice.gc.ca/eng/acts/i-2.5/; see, especially Section 3 on "Objectives and Application") primarily focusses on issues regarding the impact of immigration on the receiving nation, which is also a major if controversial focus of research internationally. At the interface of the "integration" and "impact" research efforts, more work on immigrant outcomes across the life-cycle is also undoubtedly warranted, particularly with a focus on fiscal impacts for government.

Finally, there has been relatively little large scale empirical research on the ramifications of alternative approaches to settlement service provision to support evidence-based policy in this domain. Settlement services should be interpreted broadly to include language training, job search assistance and the like, but also to include the operation of important labour market institutions (such as regulatory bodies) and policies regarding racial/ethnic/immigrant discrimination, some of which are currently being adjusted in attempts to facilitate the portability of newcomers' human capital. As is the case with most immigration policy areas, settlement is undoubtedly a "two way street" with, on one side, the provision of services focusing on assisting immigrants to adjust to, and integrate into, Canadian society and the Canadian labour market. Simultaneously, on the other side, policies also seek to make the Canadian labour market more "immigrant friendly" by facilitating the labour market's capacity to receive immigrants and maximise their productivity.

Notes

1. Thanks to Garnett Picot, Leslie Seidle, and many individuals at Citizenship and Immigration Canada, especially Strategic Policy and Planning, Immigration, and Research and Evaluation, for their advice and useful comments; any remaining errors are, of course, my own. Opinions expressed in this chapter are those of the author and are not necessarily those of either the Governments of Canada or Ontario.

2. Rapid application processing, which is impossible with a backlog, can be an important facilitator of skill portability. Matching labour market needs with immigrant skills can facilitate portability by providing jobs reasonably quickly and preventing skill atrophy during extended job search. Details regarding ministerial instructions can be found at www.cic.gc.ca/english/department/mi/#mi1.

3. For most of the early post-World War II period, the Canadian immigration rate was typically three times larger than that in the United States, but the American rate has been trending up in the past few decades. Also, prior to 1990 Canadian immigration was strongly procyclical, whereas subsequent to that it has been largely unrelated to the business cycle. For several years preceding recent changes, Canada received applications representing on the order of 450 000 individuals for a target intake of in the neighbourhood of 250 000.

4. Three distinct but related policy changes resulted in the recession of the early 1990s being the first in Canada's history as a nation to witness an increase, as opposed to a decrease, in the immigration rate with appreciable increases in refugee and family class flows. New arrivals attempting to enter the labour market during this recession found it extremely difficult to do so as evidenced by this cohort having the lowest entry earnings observed in Figure 7.1, although there were also composition issues driving this outcome. First, as outlined by Green and Green (2004), prior to this period Canada had a procyclical immigration policy and this was the first test of the new policy of acyclical immigration targets. Second, starting in 1988 the family class was expanded by relaxing the admissibility criteria and allowing unmarried children over the age of 21 to be sponsored. The majority of these immigrants arrived after the 1990-92 recession had started and a substantial number were over the age of 20. This policy was rescinded in 1992. The third source of new migration is appreciably different than the other two. It might be best interpreted as an administrative re-classification rather than new entrants being added to the labour market during a recession; it also points to the difficulty in interpreting empirical results without institutional knowledge. A spike (mostly over by 1992) in refugee admissions arose as part of a backlog clearance programme that dealt with claims made prior to 1988. Most of these individuals were resident in Canada and had entered the labour market with temporary work permits prior to 1988 so their "immigration" was actually a change of status, not a change of residency, and it had only modest labour market effects. It's worth noting that under this programme claimants who were not successful in establishing a credible case as a refugee were considered for landed immigrant status in other categories taking account of age, linguistic ability, length of residence in Canada, relatives in Canada, and similar factors.

5. Different "stories" can be told depending on whether one is looking at the trend in terms of levels (i.e. counts of individuals), or percentages.

6. Note that Figure 7.1 encompasses all immigration classes. Abbott and Beach (2011), and Sweetman and Warman (2013), show marked differences in labour market outcomes across immigrant classes and sub-classes. Overall, principal applicants in the non-business economic streams have higher earnings than all other groups.

7. Formally, Canada does not have a "poverty rate". Rather, Statistics Canada produces a Low Income Cutoff (LICO), which many people interpret as a poverty rate even though, for example, it focuses exclusively on income rather than wealth.

8. For a comparative overview of issues related to "immigrant generations" see Sweetman and van Ours (2014).

9. Virtually no data exist that permit actual pre-migration labour market experience to be measured. Hence, research relies almost exclusively upon *potential* experience that ignores periods of unemployment and is measured as something like: age-at-immigration minus years of pre-migration schooling minus 6, for those who complete their highest level of education prior to migrating (or, more generally, age minus years of schooling minus 6). However, as reported by Goldmann, Sweetman and Warman (2011) who use a dataset that has a measure of whether migrants had ever worked pre-migration, an appreciable number of females, and a small number of men report never having worked, and (surprisingly) the probability of having never worked in the formal labour market pre-migration is not correlated with age at immigration. This provides some evidence that potential labour market experience is not an ideal measure, and is particularly error-prone for females. Despite these caveats, the measure clearly remains extremely important although it may be mislabeled. Instead of pre-migration potential labour market experience it might be better called years between foreign graduation and migration. The accompanying observation is that previously immigrants educated abroad had post-migration earnings that increased with the number of years between graduation and immigration. However, recent decades have seen a reverse; longer periods between foreign graduation and migration are associated with stable or declining Canadian earnings.

10. One candidate explanation for the lack of a relationship between occupation-in-demand points and labour market success is that in this period the immigrant backlog was extensive, with skilled worker applications frequently taking on the order of four years to be processed. In contrast, the occupations-in-demand list was updated quarterly reflecting rapidly shifting perceptions of "demand", and points were assigned based on the list in force at the time the application was initiated. Plausibly, dramatically reduced processing time is required to facilitate occupational skills portability. Also, better approaches are required to separate long-term shortages from spurious short-run fluctuations, and to understand why wages are not increasing sufficiently to attract new entrants when there are long-term shortages.

11. It is worth noting that the impact of immigration on the nation's demographic profile is extremely modest. There may nevertheless be value in (marginally) improving Canada's demographic swings following from the post-World War II baby-boom rather than (marginally) reinforcing those swings.

12. The author thanks Feng Hou and Garnett Picot for this point. Additionally, although most policy development focuses on principal applicants, the education levels of their spouses tend to be positively correlated as shown by Sweetman and Warman (2010c).

However, the labour market outcomes of principal applicants' spouses tend not to be quite as good as would be expected conditional on their characteristics. Further, there has been little change in the earnings gap across educational categories among spouses.

13. Educational bridging programmes are distinct from traditional community college and university education programmes. Bridging programmes are intended to complement pre-migration education, addressing differences between immigrant and Canadian norms with the goal of supplementing a foreign qualification to make it equivalent to its Canadian counterpart. Bridging programmes are typically shorter than the relevant Canadian degree since they recognise an immigrant's pre-migration education.

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Chapter 8

Migrants' skills: Use, mismatch and labour market outcomes A first exploration of the International Survey of Adult Skills (PIAAC)

Sara Bonfanti and Theodora Xenogiani
OECD

The purpose of this chapter is to explore the newly available Survey of Adult Skills (PIAAC) to provide a detailed picture of migrants' literacy and numeracy skills and how they compare with those of natives, and how they are utilised and valued in the labour market. The chapter provides a description of the Survey of Adult Skills and the differences between migrants and natives in terms of their literacy and numeracy proficiency levels. A discussion follows on the extent to which language and foreign qualifications explain part of such differences. Moreover, the chapter analyses the labour market outcomes (employment, incidence of overqualification and wages) of migrants relative to natives and discusses how these differ across migrant groups as well as the role played by literacy proficiency and other relevant factors. The analysis of wages pays special attention to the returns to schooling, literacy and numeracy proficiency as well to professional experience, distinguishing between the experience acquired abroad and that acquired in the host country. The chapter concludes by summarising the main findings and their relevance for policy and makes proposals for future work.

8.1. Introduction

Over the past decade, migration trends have been characterised by a dramatic increase in the number of tertiary-educated immigrants in OECD countries. In 2010, there were 27 million immigrants with tertiary education in OECD countries, with an increase by 70% since 2000 (United Nations and OECD, 2013). This trend reflects on the one hand the rising education level of the world population and on the other the persisting demand for skills and the increasingly selective immigration policies in place in many OECD countries. Although it is a stylised fact in the literature that immigrants are over-represented among the highly-educated, less is known about the actual skills they bring with them and how these are used in the labour market.

Immigration policies in OECD countries have become more selective over time and competition for talent has increased fiercely not only among OECD countries but also between them and some of the emerging economies in need of highly skilled labour. Selecting and attracting immigrants with the right set of skills has become a policy objective for OECD countries. However, there is only limited evidence about the results of these policies and whether they are successful in attracting the most skilled and talented. Furthermore, important questions exist about the actual utilisation of the skills migrants bring with them in the labour markets of host countries. A detailed knowledge of the skills of migrants and how these are used in the labour market is important to evaluate immigration policies as well as integration policies. Responding to these questions has also implications for education and labour market policies if one wants to "make the most of migration".

The labour market outcomes (employment, qualification matching and wages) of foreign-born persons are on average less favourable than those of native-born individuals, and this is true even for highly educated persons. In some cases, this disadvantage remains even after several years of stay in the country. Empirical evidence points to severe underutilisation of the skills of migrants, especially when acquired abroad and/or when migrants are settled in countries which are culturally and linguistically distant from their own country of birth. Understanding why migrant skills are not fully utilised and why they get lower returns to formal education is important to adapt immigration and integration policies to make the best out of migration and ensure a successful integration into the labour market and the society of the host country.

The purpose of this chapter is to explore the newly available Survey of Adult Skills (which is part of the Programme for the International Assessment of Adult Competencies – PIAAC) to provide a detailed picture of migrants' literacy and numeracy skills and how they compare with those of natives, how they are utilised and valued in the labour market. This newly available data source makes it possible to examine some of the key questions asked above related to immigration policies and the skills of migrants which have not been fully addressed until now because of data limitations. Most importantly, this survey allows drawing comparisons across countries which differ in terms of immigration and integration policies, migration history and labour market conditions. The chapter addresses some important questions and raises others that could open new domains of research to guide policy.

The remainder of this chapter is organised as follows. Section 8.2 provides a description of the Survey of Adult Skills and presents the basic characteristics of migrants. Section 8.3 discusses the skills of migrants and how they compare with those of native-born persons. It distinguishes between formal educational attainment and assessed

skills, more specifically literacy and numeracy proficiency as well as problem solving in technology-rich environments. Section 8.4 analyses the probability of employment and then focuses on the incidence and determinants of overqualification, that is, how workers' skills are matched with those required in the jobs they hold. It also discusses skill mismatch based on subjective questions asked in the Survey of Adult Skills. Section 8.5 analyses wage differences between migrants and natives, paying special attention to the returns to schooling, literacy and numeracy skills as well to professional experience, distinguishing between the experience acquired abroad and that acquired in the host country. Section 8.6 concludes with proposals for future work.

8.2. Description of the data

The Survey of Adult Skills is a unique data source which provides rich information on the proficiency of adults (aged 16-65) in literacy, numeracy and problem solving in technology-rich environments. The survey covers 20 OECD countries[1] as well as Cyprus[2,3], the Russian Federation and three OECD sub-national entities – Flanders (Belgium), England (United Kingdom), and Northern Ireland (United Kingdom). Literacy and numeracy skills[4] were assessed using either a laptop computer or by completing a paper version using printed test booklets, depending on the respondents' computer skills. Respondents with very low literacy skills bypassed the full literacy, numeracy and problem solving in technology-rich environment assessments and were redirected to a test of basic "reading component" skills instead. This test assessed vocabulary knowledge, the ability to process meaning at the level of the sentence, and to fluently read passages of text.

As compared to previous skills surveys such as IALS (International Adult Literacy Survey) and ALL (Adult Literacy and Life Skills Survey) surveys (see OECD/Statistics Canada, 2000), the Survey of Adult Skills represents a better source to capture skills heterogeneity among the highly-educated since it allows for a more in-depth assessment of skills currently required to workers in skilled occupation. For instance, in PIAAC the literacy domain does not cover only the reading of prose and document texts, but also that of digital texts. Furthermore, even though the concept of numeracy has remained largely unchanged between ALL (in which the concept was introduced) and PIAAC, there is significantly more information available from the Survey of Adult Skills for constructing the numeracy scale (OECD, 2013b, p. 96).

On average across countries, 74% of respondents took the computer-based assessment and some 21% took the paper-based assessment as they had no or very low computer skills or expressed a preference to do so.[5] The assessment of problem solving in technology-rich was optional and therefore was carried out in only 20 countries. In addition to this assessment, the Survey of Adult Skills contains a large amount of information on personal characteristics, formal education as well as skills used in everyday life at work and at home. In particular, the survey collects a range of information on the reading- and numeracy-related activities of respondents, the use of information and communication technologies at work and in everyday life. PIAAC also contains a wide range of questions about skills and qualification mismatch with those required in respondents' jobs.

Most importantly, the Survey of Adult Skills has a complete set of questions which are specific to foreign-born persons. The survey contains information on the country where respondents and their parents were born, which allows distinguishing between foreign-born and native-born persons but also identifying second generation migrants.

The respondents are also asked to report when they entered their country of residence and when they acquired their highest qualification, allowing the distinction between recent migrants and those established in the host country since a longer time and those with qualifications acquired in the host country versus those with foreign qualifications. In addition, the survey contains a series of questions about the language(s) the respondents have learned as children, still speak and understand.

Furthermore, the Survey of Adult Skills contains a rich set of questions related to labour force participation and status in the labour market and it also contains detailed information on earnings and wages. This combination of detailed wage data with the questions related to migrants is rare and it offers a unique opportunity to conduct an analysis of the wages of immigrants in comparison with those of native-born persons and draw a comparative picture of different groups of migrants across countries.

Undoubtedly, the Survey of Adult Skills is a powerful tool to study many questions related to the skills of migrants and how these are used and rewarded in the labour market. However, it should be kept in mind that it is not without limitations. Most importantly, the survey sample is about 5 000 in most countries, except Canada, the United Kingdom, Estonia, France, Korea and Poland. Given that on average in the countries participating in the Survey of Adult skills migrants represent about 13% of the 16-65 population, this implies a small number of observations, especially when migrants are broken down in smaller groups based on their characteristics. An additional limitation related to migrants may be due to the sampling frame, because temporary migrants are difficult to capture and the survey does not cover migrants in collective housing and is as limited as other data sources (e.g. labour force surveys) in capturing irregular migrants.

As shown in Table 8.1, the migrant sample is particularly small in Japan, Korea and the Slovak Republic. The migrant population is these countries represent less than 2.5% of the total. This is in line with evidence from other data sources.[6] For this reason, these countries are excluded from the analyses that require a fine disaggregation of migrant groups. Data limitations also exist in the Czech Republic and Finland, as well as the Belgium, Italy and the Netherlands when the analysis requires an important degree of disaggregation. Sample size and availability of relevant variables (as discussed below) explain why not all countries are reported in all figures and tables throughout the chapter. It should be noted that in Belgium, the Survey of Adults Skills only covers the Flanders, but for the sake of simplicity it is reported as Belgium in all figures in this chapter. The same holds for the United Kingdom which refers to data for England and Northern Ireland only.

As already mentioned, participants are asked to provide information on the country in which their highest qualification was acquired, a crucial dimension in the analysis of the skills of migrants and their utilisation in the labour market. However, this variable proves to be of limited use as it only refers to a subset of the migrant population. As a result, the variable on foreign qualification has been computed based on a comparison between the year of acquisition of the highest qualification and the year of entry in the host country, as it is often the case in other data sources. Therefore, we cannot exclude the possibility of measurement error in particular for persons who studied in the host country, left and came back later on. In addition, no information can be derived for native-born persons who acquired their qualification abroad. Furthermore, a crucial dimension of migration, that of the reason for migration (or entry permit type), a key factor determining future labour market outcomes, is not available in the Survey of Adult Skills.

Table 8.1. PIAAC sample, number of observations and percentages

	Native-born	Foreign-born	Share of foreign-born in the sample (%)	Share of foreign-born in the 16-65 population (%)
Australia	5 345	1 970	26.9	27.9
Austria	4 347	677	13.5	16.3
Belgium	4 584	395	7.9	7.7
Canada	22 100	4 963	18.3	25.7
Denmark	5 774	1 511	20.7	11.8
Estonia	6 660	919	12.1	13.0
Finland	5 228	231	4.2	5.7
France	6 108	800	11.6	12.8
Germany	4 718	659	12.3	13.9
Ireland	4 771	1 193	20.0	21.0
Italy	4 161	425	9.3	9.3
Japan	5 154	18	0.3	0.4
Korea	6 554	97	1.5	1.6
Netherlands	4 621	462	9.1	12.9
Norway	4 310	635	12.8	13.4
Spain	5 183	786	13.2	13.3
Sweden	3 727	740	16.6	17.5
United Kingdom	7 858	948	10.8	15.0
United States	4 259	636	13.0	14.7

Note: The sample includes persons aged 16 to 65. The last column presents the share of foreign-born persons in the 16-65 population, when the sampling frame of the survey has been taken into account (the relevant weights have been used).

Source: Survey of Adult Skills (PIAAC) 2012.

Furthermore not all information is available in all countries participating in the survey. In Table 8.A1.1 in the annex, which presents the share of migrants with certain characteristics (age at migration, time since migration, etc.) also shows the countries where some of these variables are not available. For instance, there is no information about migrants' detailed country of birth in Germany and Australia and year of entry in Australia. As a result, in Australia it is not possible to distinguish between recent migrants (those who arrived no more than five years ago) and those who have been in the country for longer and group migrants according to the age at which they migrated. In addition, the variable on foreign qualification cannot be constructed for Australia. Moreover, the problem solving in technology-rich environments was optional and was not administered in France, Italy and Spain.

Finally, a statistical tool needs to be used with data from the Survey of Adult Skills in order to ensure correct estimation of standard errors. This tool takes into account the sampling frame of the survey and controls for sampling error through the Jackknife Repeated Replication technique. In addition, it accounts for possible measurement error related to the different plausible values for the assessment variables (literacy, numeracy and problem solving), as not all participants were tested on all subjects. The use of this tool imposes some constraints on the type of analytical tools that can be used but also on whether countries can be pooled together. This is an important constraint in particular when analysing the outcomes of detailed migrant groups who tend to be small in many of the countries participating in the survey. Most importantly, to address some of the policy-relevant questions raised above we would need a finer disaggregation of migrants and/or pooling host countries together, which is not straight forward with the use of the statistical tool.

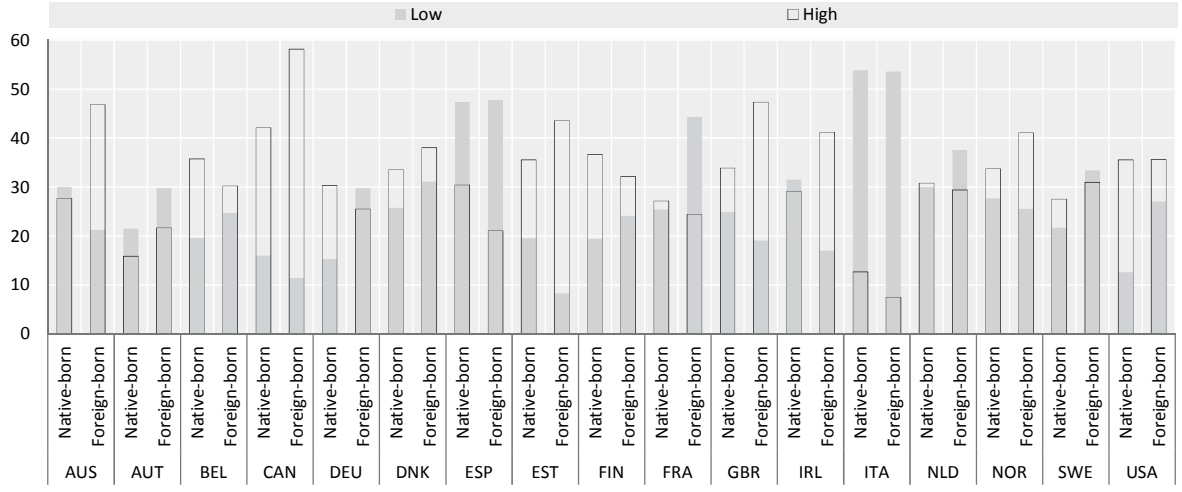
8.3. Migrants' skills and how they compare with those of natives

Migrants' educational attainment

Migrants in many OECD countries are over-represented at both ends of educational distribution. Relative to natives, migrants are over-represented among the tertiary-educated in many countries except Belgium, Finland, Germany, France, Italy, the Netherlands and Spain (Figure 8.1). In the United States, the share of natives and migrants among tertiary-educated persons is the same (35%), while higher shares of tertiary-educated migrants than natives are recorded in particular in Canada (16 percentage points), Australia (19 percentage points) and the United Kingdom (15 percentage points) and somewhat smaller but important in Ireland (12 percentage points) and Estonia (8 percentage points). The increasingly selective immigration policies are reflected into the greater share of highly educated migrants among recent migrants (those who have been in the country for five years or less) in comparison with those who have been settled in the country for longer. In the majority of countries in Figure 8.A1.1 in the annex, the share of tertiary-educated recent migrants is significantly higher than the share of recent migrants with low levels of education. In addition, recent migrants are over-represented among the highly educated ones. The differences are quite important in Germany, the United States, Estonia, Austria and Denmark.

Figure 8.1. Educational attainment by place of birth

Percentages



Note: The sample includes persons aged 16-65. Low educational attainment refers to less than upper secondary education and high educational attainment to tertiary education.

Source: Survey of Adult Skills (PIAAC) 2012.

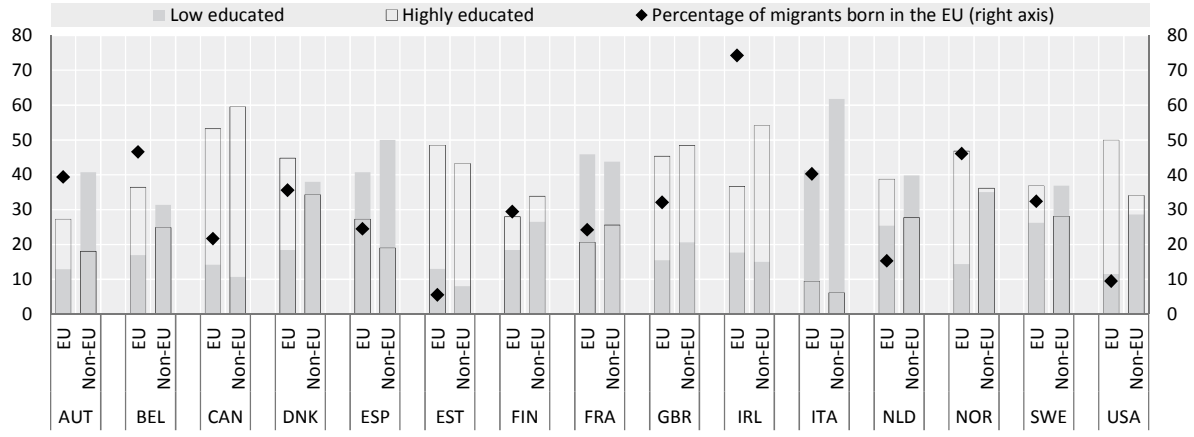
In all countries except Austria, Germany, France, Italy, the Netherlands, Sweden and Spain, the share of migrants with tertiary education is higher than that with low-education. Differences are particularly sharp in Canada where 58% of foreign-born have higher education versus only 11% with low education, in Estonia (44 versus 8%), the United Kingdom (48% versus 19%) and Poland (46% versus 13%). In contrast, in Spain, 48% of migrants are low educated and only 21% have higher education. These differences in educational attainment across countries are explained by a combination of

factors which may be related to migration policies, geography and the demand for labour in the country.

Figure 8.2 shows that migrants from EU countries are overall more highly educated than those from non-EU countries in the majority of countries, except Canada, the United Kingdom, France and Ireland. In Austria (Norway), the share of low-educated among EU migrants is 13% (14%), while it is 40% (35%) for migrants from non-EU countries. In contrast in Ireland, EU migrants represent about three quarters of all immigrants and about 37% of them have tertiary education, versus a 55% for non-EU migrants.

Figure 8.2. Educational attainment of the foreign-born by EU/non-EU origin

Percentage of respective migrant population



Note: The sample includes persons aged 16 to 65. Low educational attainment refers to less than upper secondary education and high educational attainment to tertiary education.

Source: Survey of Adult Skills (PIAAC) 2012.

Table 8.2 shows the share of migrants (with all levels of education) who acquired their education abroad, in selected OECD countries. With the exception of Estonia, the majority of migrants have acquired their highest qualification prior to arriving in their current host country. In most countries, the share of migrants with foreign qualification[7] ranges between 53% and 63%. This evidence is consistent with that presented in Damas de Matos and Liebig (2012) who use labour force data for European countries and the United States. In Spain and Austria, the share of migrants who have been educated abroad is higher, 77% and 70% respectively. The share of migrants with qualifications acquired in the host country is higher among tertiary-educated ones, except in Canada, Ireland and Germany. In the United States, the share of tertiary-educated persons with United States qualifications is high (63%) in comparison with all other countries (except France). This finding for the United States may be linked to the presence of an important number of international students (684 000 in 2010) which make the country the first destination for students who study abroad. A similar argument may apply to France, the fourth most popular OECD destination of international students (260 000 students in 2010).

Table 8.2. Share of migrants with foreign highest qualification, by education level and EU/non-EU origin

Percentages

	All education levels			Tertiary educated		
	All foreign-born	EU	Non-EU	All foreign-born	EU	Non-EU
Austria	69.9	69.9	69.9	62.7	65.7	59.8
Belgium	64.3	65.5	63.2	63.9	65.9	61.4
Canada	55.3	43.5	58.5	57.2	43.9	60.5
Denmark	53.2	54.0	52.7	51.6	49.9	52.9
Estonia	40.5	53.7	39.8	39.9	61.5	38.5
Finland	53.0	43.0	57.2	52.6	29.2	60.6
France	51.4	52.0	51.2	37.4	56.8	32.4
Germany	57.3	..	..	62.4	..	..
Ireland	63.3	63.1	63.7	65.6	63.8	69.1
Italy	68.2	58.2	75.0	50.3	38.0	62.9
Netherlands	56.6	65.8	55.0	49.5	69.9	44.4
Norway	61.7	66.4	57.7	60.5	62.4	58.5
Spain	77.4	68.3	80.4	74.0	63.2	79.1
Sweden	52.5	54.2	51.6	53.1	52.3	53.7
United Kingdom	56.5	61.4	54.3	53.3	55.3	52.4
United States	55.9	24.1	59.2	37.3	24.7	39.2

Note: The sample includes persons aged 16-65. In the Australian data, it is not possible to identify the country in which the highest qualification was obtained, hence the country is ommited from the table. In addition, it is not possible to distinguish between EU and non-EU migrants in Germany.

Source: Survey of Adult Skills (PIAAC) 2012.

Overall, migrants from EU countries are more likely to hold foreign qualifications than those from non-EU countries with some exceptions (Canada, Finland, Italy, Spain and the United States). In the United States, three quarters of EU migrants have acquired their tertiary-level qualifications in the country while in France two thirds of non-EU migrants have also been educated in the country. These differences between countries and in particular between EU and non-EU migrants are likely to be reflected in the comparisons in terms of literacy proficient results that will presented in the next sections.

Migrants' performance in literacy, numeracy and problem solving assessments

Literacy was assessed in the Survey of Adult Skills as the ability to deal with written texts. To account for the characteristics of many work environments, the assessment did not only use texts on paper, but also in digital formats such as a webpage. Respondents were successively confronted with a number of different tasks asking them to identify and process information from one or more texts. Depending on the difficulty of the texts and the task demanded, respondents might be asked to only identify a piece of explicit information or even to recover implicit information by synthesising several sources. Similarly, processing the identified information might be unnecessary or might require weighing conflicting arguments and the use of background knowledge.

Respondents' individual literacy level was determined in the survey by the overall score they reached across the various tasks. To perform at level 5, respondents typically needed to gather information from several dense texts, evaluate different perspectives, and make high-level inference. At level 4, it was expected to retrieve the relevant information in several steps from lengthy texts and base complex inferences thereon. Level 3 required understanding a lengthy or dense text and applying various levels of inference. At level 2, two or more pieces of information had to be integrated for low-level

inference, while level 1 requires the retrieval of a single piece of information from a relatively short text that uses basic vocabulary. Finally, below level 1, the use of the same word in the task allows to locate information in a brief text on a familiar topic. (For more detail on the levels, see Table 2.2 in OECD, 2013b.)

On average, foreign-born persons in the OECD countries participating in PIAAC have lower scores in literacy proficiency than the native-born, a finding that seems to contradict the evidence on educational attainment presented in the previous section (Figure 8.3). The average difference is about 27 points, which corresponds to half a level in terms of literacy proficiency. However, great differences exist across countries, which can be categorised into three main groups. First, there are no differences in literacy proficiency between migrants and natives in eastern and central European countries such as the Slovak Republic and the Czech Republic. This outcome is possibly related to the linguistic proximity of these countries and those where the majority of their migrants come from. A second group of countries is composed by English speaking countries (e.g. the United Kingdom and Ireland) and those with points systems in their migration policies (Australia and Canada), where the literacy gap between migrants and natives is small. This outcome in Australia and Canada may be driven by the migration policies in these countries which pre-select persons with high education and/or persons with good proficiency in English in comparison with other languages. It is also driven by integration policies in place which recognise language proficiency and learning as a key element of labour market integration and success. Nordic countries (Sweden, Finland, Norway and Denmark) and other central European countries (France, Belgium, Germany and the Netherlands), together with Korea and the United States form a third group of countries, where native-born persons have substantially higher literacy proficiency than native-born ones. The gap is particularly important in Sweden and Finland, possibly because of the limited proximity between their languages and those spoken by their migrants. In the case of Sweden, more than in others, this may also be related to the important numbers of refugees from far away countries.

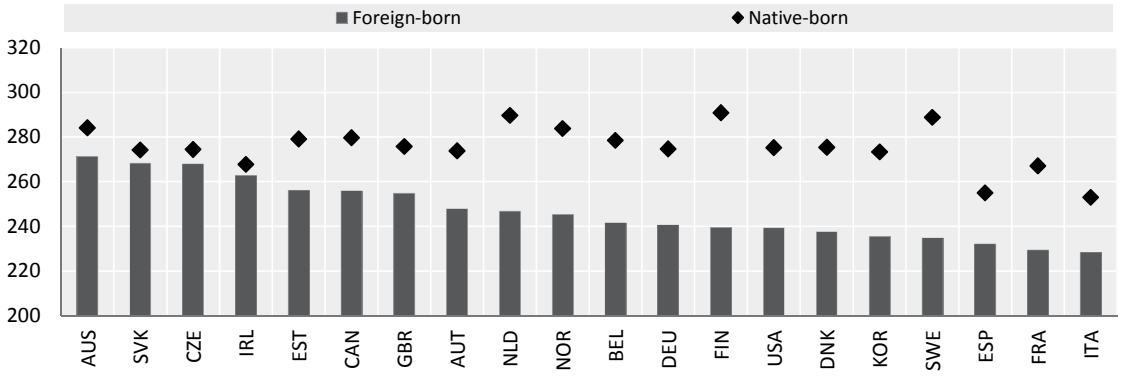
The literacy proficiency gap between immigrants and natives in the United States, is in line to some extent with the results on educational attainment in Figure 8.1 and may be linked to the composition of migrants by country of origin (non-native English speakers from Mexico are the most numerous migrant group in the United States) as well as the higher share of family migrants in total flows (OECD, 2013a). This evidence also confirms that found by other studies (Antecol et al., 2003) which shows that geography explains why migrants in the United States have lower English fluency than those in Canada and Australia.

These patterns across countries and between migrants and natives may mask important differences in terms of the age structure of the population and the characteristics of migrants in the country, which is to a large extent a function of historical migration trends. According to OECD (2013b), differences in literacy performance across OECD countries are to some extent driven by differences in the age structure of their populations. Following that, if there are important differences between migrants and natives in terms of their age structure, then this may be one of the factors explaining differences in literacy proficiency between these two groups. Figure 8.A1.2 in the annex presents the raw differences between the two groups as well as that adjusted for age and gender. In the majority of countries, controlling for these characteristics does not significantly alter the patterns presented in Figure 8.3**,** suggesting that age and gender differences are not driving the observed raw patterns. However, this finding can also mask differences in literacy proficiency between young and older migrants which are

related to improved language proficiency. Young migrants are on average more educated than older ones, and hence more likely to have a higher level of literacy proficiency. But at the same time, they have spent on average less time in the host country and hence may have a more limited knowledge of the host-country language. These two effects may cancel out, which could explain why controlling for age does not alter the literacy differential between migrants and natives.

Figure 8.3. Performance in literacy, by place of birth

Literacy score points



Note: The sample includes persons aged 16-65. 50 points in the literacy proficiency score correspond to about a level of literacy.

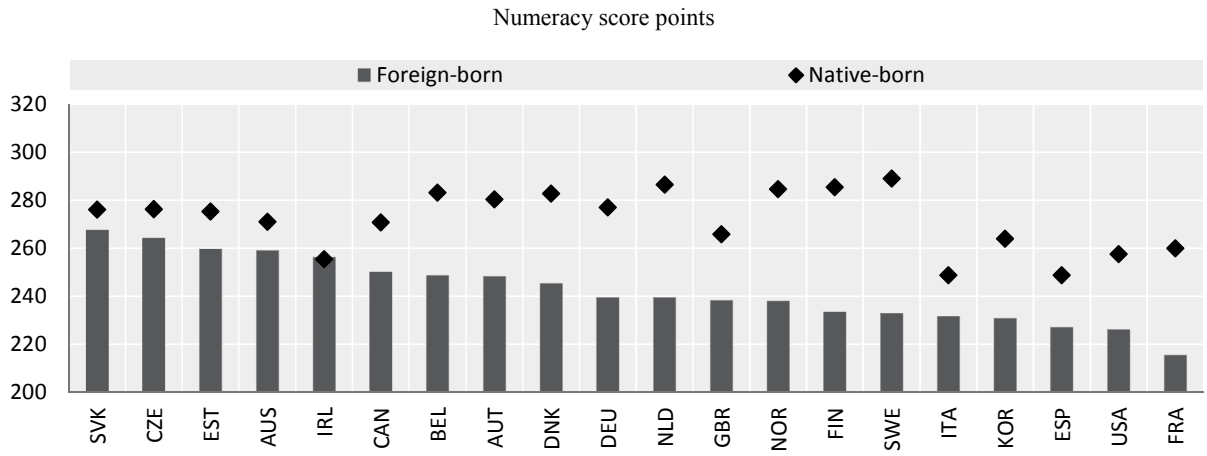
Source: Survey of Adult Skills (PIAAC) 2012.

Literacy proficiency may reflect at least two different sets of skills: first, true literacy skills which are related to the level and quality of education completed and second, language fluency. Migrants are likely to have on average lower proficiency in the language of the host country than the native-born and this would be reflected into lower scores for them in comparison with their native peers even though their cognitive skills may be similar. A similar issue may arise in the case of the numeracy assessment in the Survey of Adult Skills because of the content of numeracy questions in the Survey of Adult Skills as described in the *OECD Skills Outlook 2013* which requires a good level of language skills to understand the question and answer it. Indeed, the correlation between literacy and numeracy is fairly high: 0.77 for natives and 0.80 for migrants. Indeed, the results on numeracy proficiency (Figure 8.4) are quite similar with those on literacy and the differences between migrants and natives are only slightly higher when numeracy is considered, although the difference is not statistically significant.

The scores presented in Figures 8.3 and 8.4 are average values at the country level, which can mask differences in the distributions across the different levels of skill proficiency. It is hence interesting to examine the distribution of persons by country of origin across the different levels of skill proficiency (Figure 8.5). There are indeed sharp differences between migrants and natives in the Nordic countries and in the Netherlands. For instance, in Denmark close to 40% of migrants score at level 1 or below whereas this percentage is 13% among the native-born population. Looking at those scoring at levels 4 and 5, there are also important differences between migrants and natives but less heterogeneity across countries when only migrants are considered. About 7% of foreign-born persons in the countries reported in Figure 8.5 score at high levels of literacy proficiency (13% for native-born persons). This percentage ranges from 1% in Italy and

3% in France and Spain to 16% in Australia. The evidence presented in Figure 8.5 confirms the evidence based on IALS and presented in OECD and Statistics Canada (2000) and Kahn (2004), which suggests that migrants in OECD countries are concentrated both among the high- and the low-skilled.

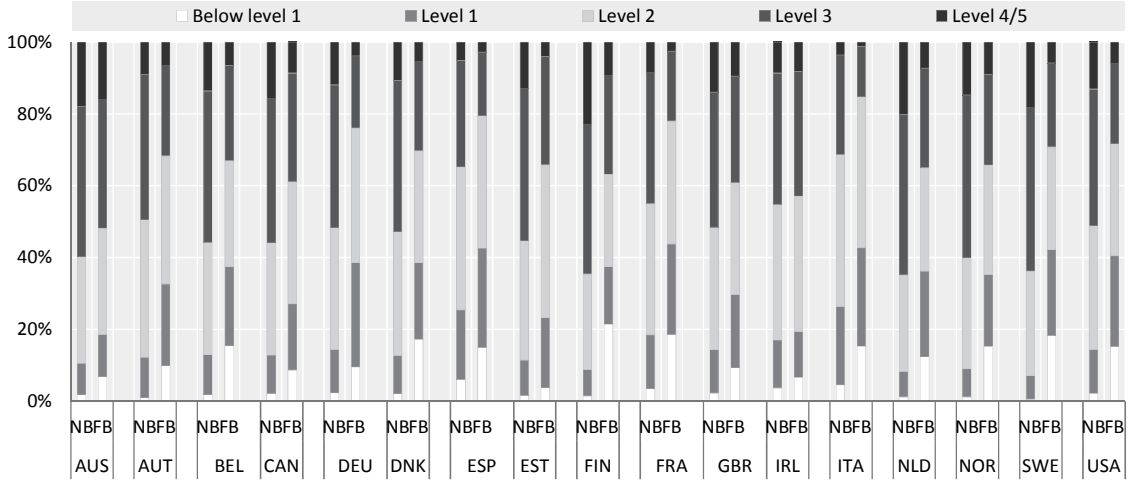
Figure 8.4. Performance in numeracy, by place of birth



Note: The sample includes persons aged 16-65.

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.5. Distribution across levels of literacy, by place of birth



Note: The sample includes persons aged 16-65.

Source: Survey of Adult Skills (PIAAC) 2012.

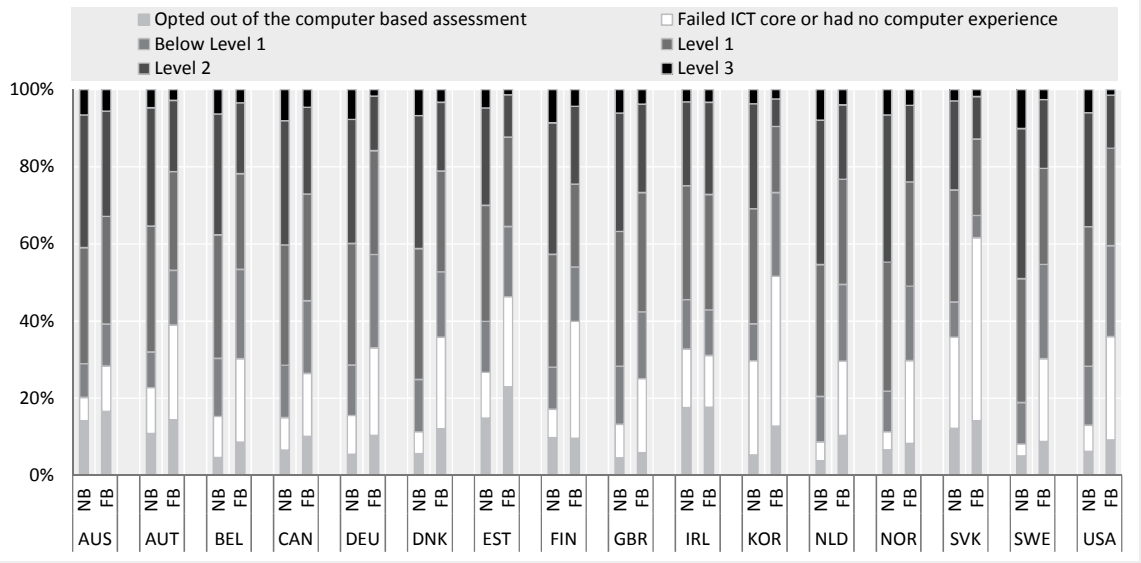
Box 8.1. Problem solving in technology-rich environments in the Survey of Adult Skills

Adults in the Survey of Adult Skills have been also assessed in terms of their capacity to solve problems in technology-rich environments. According to the *OECD Skills Outlook 2013* "this assessment is designed to evaluate the ability of adults to solve problems in which the information they use is accessed through ICT applications and the solution either requires the use of, or is made easier by the use of, ICT tools. Such skill captures a combination of "computer literacy" with "cognitive skills needed to solve problems". A prerequisite for doing the assessment is some basic knowledge of ICT but this is not the main skill that the test aims to assess. The complexity of the problem solving assessment is related to the combination of skills needed to perform but also to the range and tools that the person needs to use in order to solve the problem. The share of persons who participated in this exercise differs substantially across countries. It ranges from a low of 24% in Estonia to a high of 87.9% in Sweden. In addition, Italy, France and Spain did not participate in this exercise.

The figure below presents the results on problem solving by level and foreign-born status. As it can be seen, in some countries a substantial share of the population has not taken the test either because they failed or because they had no computer experience. On average, 13.5% of migrants in the countries included in the figure below opted out of the computer-based assessment, versus about 10% among native-born persons. About a fifth of migrants (22%) failed the ICT core test or had no computer experience to complete the test, while the respective percentage among natives was the half. However, important differences exist across countries. In the Slovak Republic, more than 60% of migrants opted out or failed the test, and in Korea and Estonia this percentage is close to 50%.* The share of persons at level 1 or below is similar between migrants and natives in most countries. The main differences are found among those at level 2. On average, 18% of migrants are at level 2, whereas for native-born persons this percentage is 30%. The differences between the two groups are sharp in Sweden (+21 percentage points for natives), Norway, the Netherlands and Germany (+18 percentage points), Denmark (+17 percentage points) and Finland (+14 percentage points).

Distribution across levels of problem solving, by place of birth

Percentages



Note: The sample includes persons aged 16-65. France, Italy and Spain did not participate in the problem solving in technology-rich environments assessment.

Source: Survey of Adult Skills (PIAAC) 2012.

* Given these limitations related to the problem solving assessment, it is not considered in the analysis that follows. Focusing on the persons who completed the assessment and using this variable as an indicator of skills for migrants would be misleading as it would only focus on a highly selected sample.

Is educational attainment a good measure of skills?

Although schooling is necessary to improve the performance on literacy skills, the correlation between literacy skills and educational performance is complex and far from perfect. Literacy tests do seem to measure skills on top of those captured by educational attainment. This section examines the distribution of assessed skills within the different levels of education. It is worth noting that in a number of countries average literacy scores among migrants with tertiary education are lower than those for natives with upper secondary level of education (Figure 8.6).[8] In particular, differences are quite substantive in Sweden, Norway, the Netherlands, Finland and Denmark. Likewise, we find similar differences between foreign-born adults with upper secondary education and native born adults with less than upper secondary education.

A first clear message from Figure 8.6 is that in many countries, the variance of literacy proficiency is higher among migrants than among natives, in particular for those with low- and medium-level qualifications. This finding suggests that using highest qualification attained as a measure of education may be particularly problematic for migrants as it reflects a wide distribution of literacy skills, persons who are not necessarily similar in terms of their literacy proficiency. In addition and very importantly, the same highest education level reflects very different literacy proficiency levels for migrants and natives and hence is an imperfect proxy for their literacy skills.

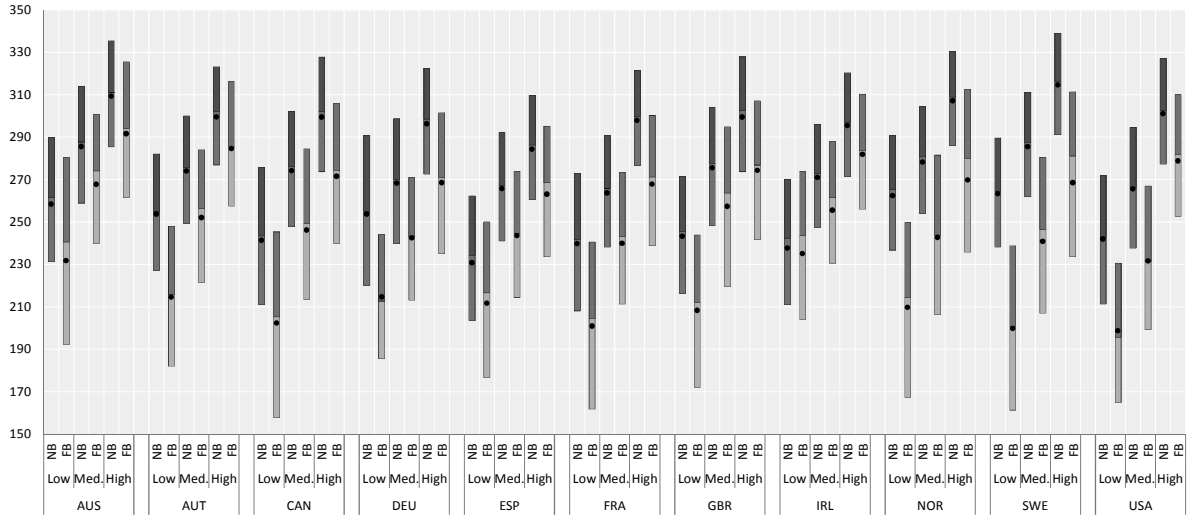
The gap between migrants and natives in terms of literacy proficiency is greatest among the least educated ones in the majority of countries (not in Finland, Spain and Ireland and Italy) (Figure 8.7). The difference between this group and those with more schooling (both medium and high education) is very important in some countries, such as Sweden, Norway, France, the Netherlands, Austria, Germany, Denmark and the United Kingdom. The results are quite similar for those with medium and those with high level of education. Only in the United States the gap between foreign-born and native-born is substantially more important among the medium-educated than the tertiary-educated ones. In Ireland, both these two groups have average literacy performance which is lower than that of their native-born counterparts, while the difference between natives and migrants is much smaller (close to zero) for the low-educated ones. This is the smallest literacy gap between migrants and natives, across all groups and countries. The results in Figure 8.7[9] suggest that there may a serious issue with the literacy proficiency skills of low-educated migrants, which calls for special policy attention. The fact that this group of foreign-born persons possesses a very low set of literacy skills (see also Figure 8.6) in combination with their important numbers and shares in most OECD countries (Figure 8.1) suggests that countries may have an interest to implement specific measures targeting this group of migrants.

These results also call for discussion regarding the type of skills that are likely to be reflected into the literacy performance of migrants. The majority of migrants (two-thirds) took the test in a language which is different from their own native language. As a result, for these migrants, literacy and numeracy assessments reflect to a varying degree their knowledge of the test language. On the one hand, this consideration makes comparisons between natives and migrants' performance rather difficult as it suggests that it may reflect different types of skills for the two groups and may disadvantage migrants who have taken the test in a foreign language. On the other hand though, it represents a particularly valuable and rare measure of migrants' language skills. These considerations should be kept in mind when interpreting the results in this chapter. It should also be kept in mind that additional skills may be well relevant in some sectors, jobs and countries.

For example, in some countries (e.g. in the Nordic countries and the Netherlands), in the high-tech sector in particular and other highly skilled sectors more generally, good English language skills may be more relevant than speaking the host-country language. Unfortunately, the Survey of Adult Skills does not allow an in depth analysis of these issues as it does not provide detailed information on the different languages spoken by the individual.

Figure 8.6. Distribution of literacy scores, by education and place of birth

Literacy score points

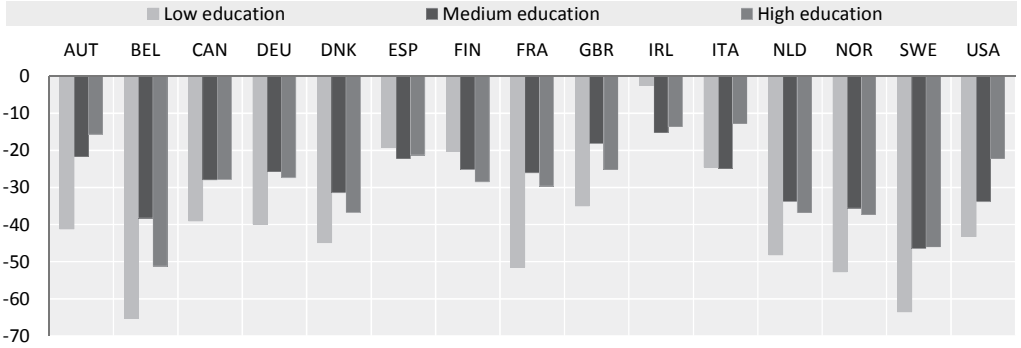


Note: The sample includes persons aged 16 to 65. The lower end of the bar represents the 25th percentile, while the upper one the 75% percentile. The black dot in the middle is the mean. Low education corresponds to less than upper secondary, medium education to upper secondary and high education to tertiary education.

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.7. Gap in literacy performance between migrants and natives, by education level

Score point difference



Note: The sample includes persons aged 16 to 65. Low education corresponds to less than upper secondary, medium education to upper secondary and high education to tertiary education.

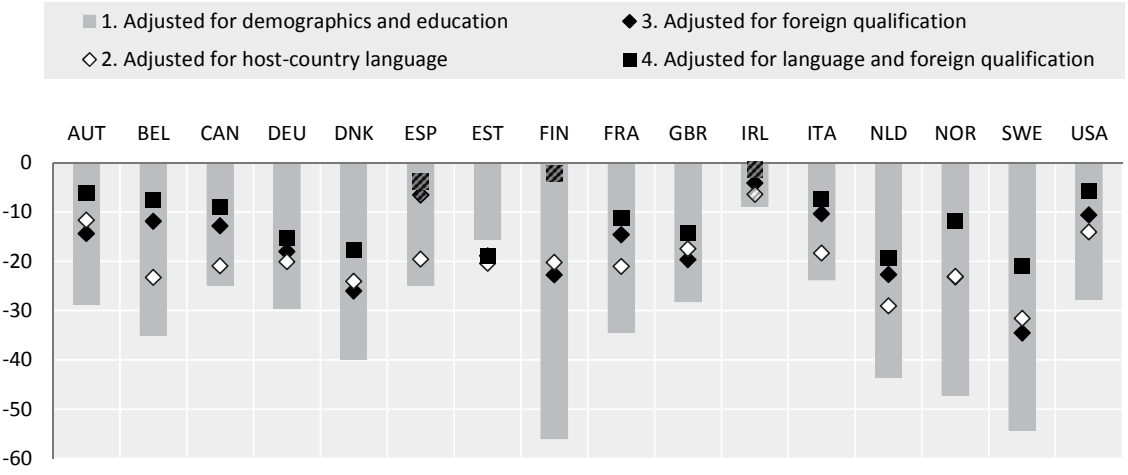
Source: Survey of Adult Skills (PIAAC) 2012.

What is the role of language and host-country qualifications in literacy proficiency differences between migrants and natives?

The analysis above shows that there are important differences in literacy proficiency between foreign-born and native-born persons with the same levels of education, which may reflect a combination of language difficulties, limited transferability of skills acquired abroad and differences in the quality of the educational systems across countries. In this section, we exploit the information available in the Survey of Adult Skills to try to understand what drives these differences by distinguishing between different possible explanations. Figure 8.8 presents the difference in literacy proficiency between migrants and natives once two key characteristics have been taken into account.[10] First, the language of the migrant and second the country where his highest qualification was acquired. The language variable compares the language spoken in the host country (in which the literacy assessment is administered) with those that the migrant has learned and still understands/speaks. More specifically, it combines the information available in the Survey of Adult Skills about the first two languages the person learned as a child and still understands and that spoken at home.

Figure 8.8. Adjusted differences between migrants and natives in literacy proficiency

Score point difference



Note: The sample includes persons aged 16 to 65. The results in this figure are coefficients obtained from separate regressions with controls for level of education, age, gender and parental background. Parental educational background is defined as the highest educational level between the mother and the father. Specification 1 only contains these controls, while specification 2 also includes a dummy variable which takes the value one if the migrant speaks the host-country language at home or has learned the host-country language as a child and still understands and zero otherwise. Specification 3 contains the basic controls and a dummy variable which takes the value one if the respondent has received his/her qualification abroad. Finally, specification 4 contains both the dummy for host-country language and that for foreign qualification. The striped diamonds and squares indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

On average across the countries presented in Figure 8.8 controlling for host-country language accounts for about 33% of the differences in literacy proficiency between migrants and natives. In Finland and Austria, language accounts for 64% and 60% of the difference, while in Norway, for about 50%. In contrast, in Canada, only 16% of the difference is accounted for by language. Likewise, in Italy, Ireland and Spain, the language matters less (less than 30%) in comparison with other OECD countries. Although these are very interesting finding, they should be interpreted with caution. Speaking the host-country language at home may also capture other (observed and unobserved) characteristics of the household which have not been taken into account in this analysis.

The country in which the qualification was acquired accounts on average for 46% of the differences in literacy proficiency between foreign-born and native-born. In the United States and Belgium, controlling for foreign qualifications accounts for 60% and 65% of the difference respectively, and close to 60% in France, Finland and Italy. In contrast, in the United Kingdom, only 30% of the initial difference between natives and migrants reflect differences which can be attributed to the country where education was completed. The analysis on foreign qualifications is likely to control both for differences in the quality of education across countries, but also language skills of those migrants who have studies in the host country. A final analysis in Figure 8.8 which takes into account both factors shows that on average across countries language and foreign qualification account for two thirds of the initial gap in literacy proficiency between similar foreign-born and native-born persons.

What is the role of education and parental background in literacy and numeracy performance?

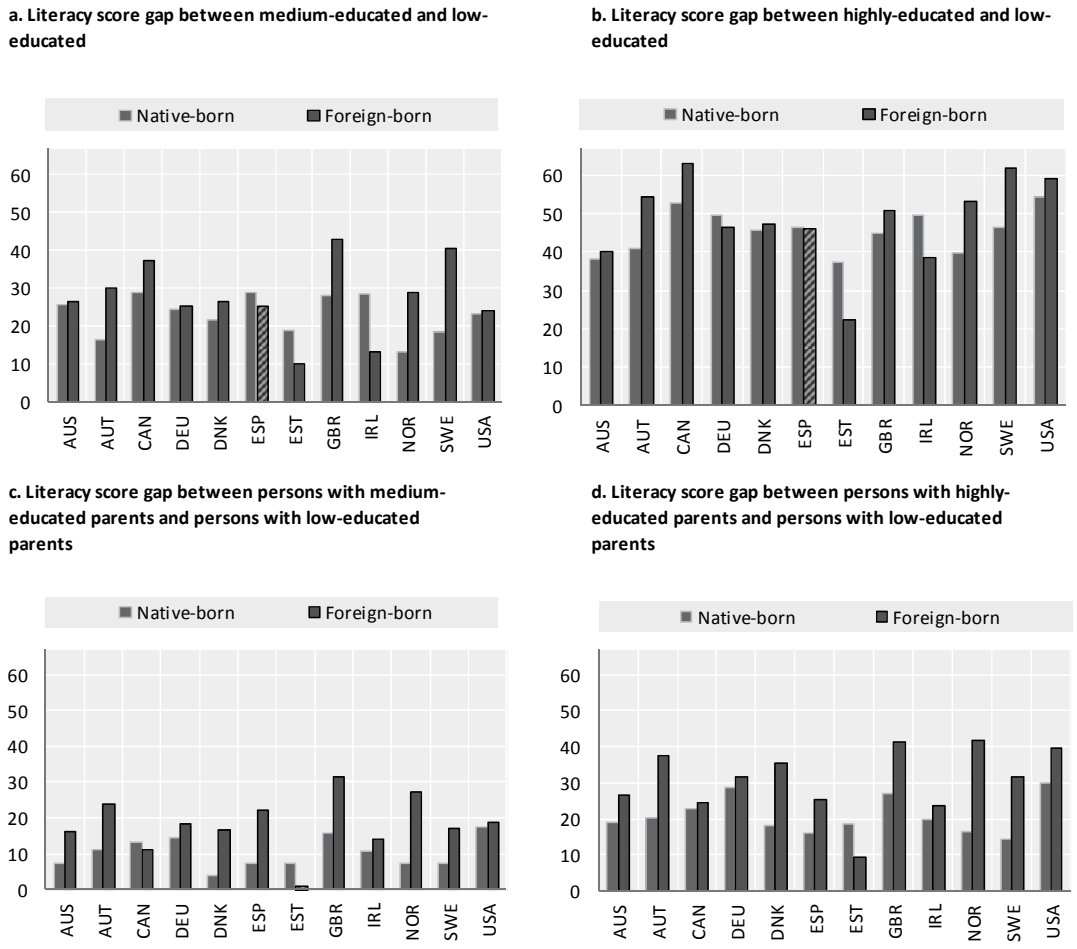
Figure 8.9 presents the results of simple linear regressions of literacy proficiency (the continuous score variable) on basic demographic characteristics (age and gender) and educational attainment of the person as well as that of his/her parents. The educational background of parents is defined as the highest educational level between the mother and the father.[11] A person's education and the educational background of the parents are positively correlated with assessed skills but also with each other. Assessed skills are substantially higher for individuals with medium (Figure 8.9a) and higher education (Figure 8.9b) and the correlation between high-education and literacy is close to 1.2 or two times that between medium education and literacy. The correlation between one's highest level of education and literacy performance is greater among migrants than natives in a number of countries such as the United Kingdom, Austria, Norway and Sweden. In the United States, Australia, Spain, Germany and Denmark, the correlation between education and literacy performance is similar for migrants and natives.

In addition to one's level of education, the educational background of parents is also a predictor of literacy and numeracy skills of individuals. Although correlations between parental education and literacy levels are smaller in magnitude than that between literacy and own education, parental background is a key determinant in particular for migrants. For example, in Norway, having a parent with tertiary education is associated with 40 extra points in the literacy score (50 corresponds to about an extra level), for foreign-born persons, where it is associated with 17 extra points for natives (Figure 8.9d below). This correlation is also large in magnitude in the United Kingdom, the United States and Austria and only somewhat smaller in Denmark, Germany and Australia. In all countries except Estonia, the correlations are stronger for migrants than for natives. Having a parent with medium education in the United Kingdom is associated with 30 extra points in literacy for migrants, twice the correlation for natives (Figure 8.9c below). The

association between the two is also important in Austria and Spain and in all cases it is at least two times that for natives.[12] These findings provide support to the importance of inter-generational transmission of skills for migrants.

Figure 8.9. Gap in literacy performance between migrants and natives, by education level and parental education level

Literacy score points



Note: The sample includes persons aged 16 to 65. The coefficients presented in these figures represent the estimated coefficients of medium level and high level of education (relative to low level) in a regression where the dependent variable is literacy performance. Regressions are estimated separately for migrants and natives and they also include controls for age and gender. Low education corresponds to less than upper secondary, medium education to upper secondary and high education to tertiary education.The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

How do the different groups of immigrants compare?

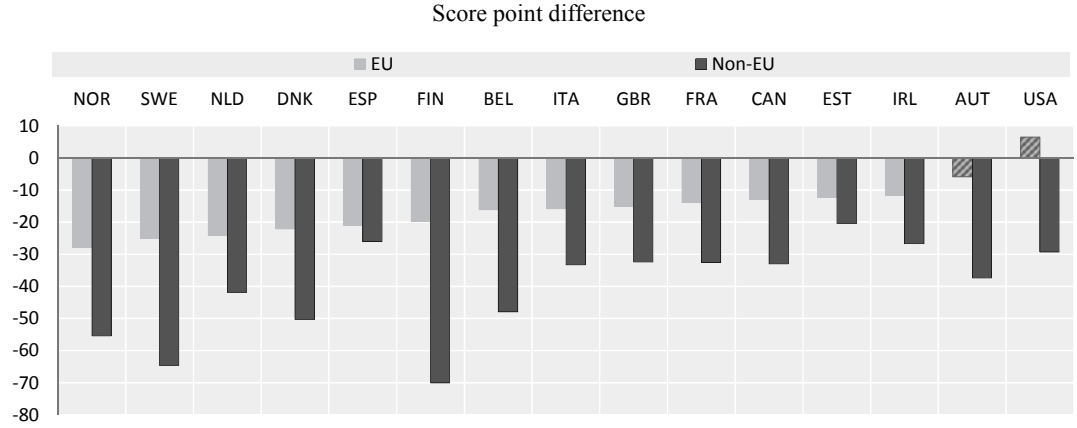
Migrants do not form a homogeneous group and more attention should be paid to their characteristics that are likely to determine their education levels and skills proficiency. In addition, differences in the composition of the migrant groups across countries may explain the differences in outcomes as presented in the previous sections. In this section, we examine how average literacy proficiency varies between natives and the different groups

of migrants defined on the basis of their country of birth, the duration of stay in the host country, the age at which they arrived in the host country, where the highest qualification was acquired and the language spoken by the migrant, taking into account differences in age, gender, education and parental background between migrant groups and natives.

First, we distinguish between migrants from EU and non-EU countries. In the context of global competition for highly skilled migrants, it is interesting to know how EU countries are faring in comparison with the United States and Canada in attracting highly skilled Europeans. According to Figure 8.10, EU migrants have on average literacy and numeracy scores which are closer to those of native-born persons that those of non-EU migrants in all countries. In particular, in Austria, Ireland and the United Kingdom, migrants from EU countries have higher or only slightly lower mean literacy and numeracy scores than native-born persons. In the United States, migrants from EU countries have similar levels of literacy proficiency as natives. These results reflect at least two main issues. First, educational systems in EU countries may be of higher quality than those in countries outside the European Union (especially developing ones), and second recognition of qualifications process is easier within the EU than for migrants who have been educated outside the European Union. The composition of the groups in terms of specific countries of origin may also explain this evidence. For example, in the United States, only 9.5% of the foreign-born population are from EU countries, while the majority of those from non-EU countries are Mexicans with low education levels, a fact that may explain the large differences in average literacy proficiency between EU and non-EU migrants. In Canada, the difference between the two groups is much smaller than in other countries.

Literacy levels of EU migrants are fairly similar across countries, with the exception of the United States (not statistically different from those of natives), the Netherlands, Norway and Sweden (much lower) which can be a combination of the composition of the EU migrant groups in these countries (mix between EU migrants from the new member states and old EU countries), the complexity of the language and the small share of migrants who speak the language when migrating. Unfortunately, the Survey of Adult Skills does not allow us to analyse separately the different groups of EU migrants because of the small samples in most of the countries in question.

Figure 8.10. Differences in literacy proficiency between migrants and natives, by EU/non-EU origin



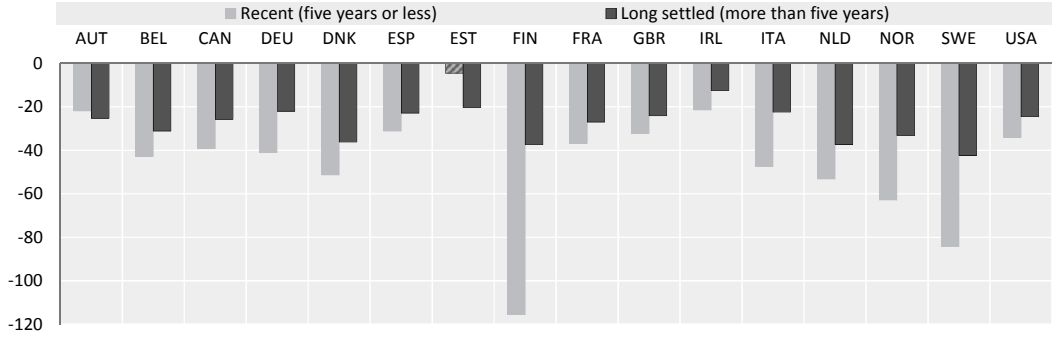
Note: The sample includes persons aged 16 to 65. The coefficients presented in the figure are from separate regressions which include controls for age, gender, level of education and level of parental education. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

A number of studies have documented the catching-up effect of migrant wages that is to say the convergence over time of migrant wages to those of their native peers (Chiswick, 1978; Borjas, 1985 and 1995; Lubotsky, 2007). With time spent in the host country, migrants improve their language skills, have more information about the labour market and develop also a wider network, which altogether enable to find jobs which correspond better to their qualifications and skills. If literacy proficiency in the Survey of Adult Skills captures linguistic skills, then we should expect to see some improvement of literacy performance with time spent in the host country. However, it should be noted that comparing recent with non-recent migrants will only to some extent provide a clear answer to this question, as migrants who have stayed in the country may not be a representative sample of those who entered at the time. It may be that only successful migrants, for example those who have a job and are in an advantaged situation, or those who have no possibility to move to another country because of their status (e.g. refugees) are more likely to stay. In addition, migrants who have been in the country for more than five years represent a rather heterogeneous group, which has been formed by past migration policies and historical migration trends. Bearing these caveats in mind, Figure 8.11 shows that in all countries except Austria where there is no significant difference, more established migrants have higher literacy proficiency than recent ones. The difference between the two is particularly sharp in the Nordic countries with complex and rare languages and comprehensive integration policies in place (Finland, Sweden and Norway). In contrast, in English-speaking countries (Canada, the United Kingdom and the United States) the differences are small.

Figure 8.11. Differences in literacy proficiency between migrants and natives, by duration of stay

Score point difference



Note: The sample includes persons aged 16 to 65. The coefficients presented in the figure are from separate regressions which include controls for age, gender, level of education and level of parental education. The striped bars indicate coefficients which are not statistically significant (at 10% level).

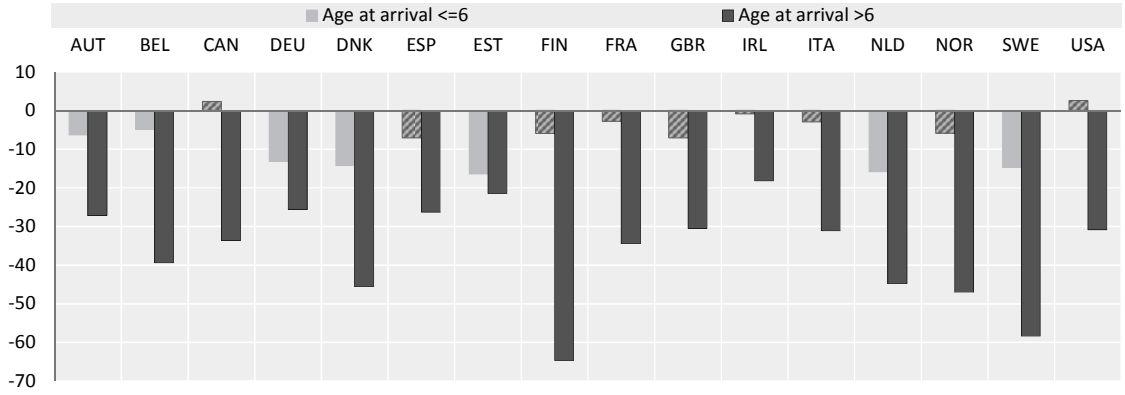
Source: Survey of Adult Skills (PIAAC) 2012.

Evidence shows that age at which migrants arrive in the host country is an important determinant of their future labour market outcomes (Friedberg, 1992). Migrants who arrive as children have been longer and at a younger age exposed to the host-country language and are hence likely to have better linguistic skills than those arriving as adults. In addition, they may also have more information about the way that labour market operates, wider networks and knowledge of social rules. In this chapter, we have separated migrants into two groups: those who arrived below age six and those arriving after that age. Those arriving as young children have attended all compulsory education in the host country and in that respect they are likely to be more similar to native-born persons than migrants who arrived at a later age or as adults. Figure 8.12 presents the differences between these two groups of migrants and

natives with similar age, education, gender and parental background. In a number of countries (Canada, the United Kingdom, Finland, France, Ireland, Italy, Norway, Spain and the United States) migrants who arrived as young children have literacy scores that are indeed close to those of native-born persons. Only in the Netherlands, Sweden, Denmark, Estonia and Germany they lag behind the scores of natives, but to a lesser extent than their peers who arrived after the age of 6.

Figure 8.12. Differences in literacy proficiency between migrants and natives, by age at arrival

Score point difference



Note: The sample includes persons aged 16 to 65. The coefficients presented in the figure are from separate regressions which include controls for age, gender, education and parental education. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

8.4. The labour market outcomes of migrants

The previous section has shown that migrants have on average lower proficiency levels than natives, and this is to a large extent driven by an imperfect knowledge of the host-country language, and differences in the quality of the educational systems across countries. In this section, we turn to the labour market and examine how migrants are faring relative to natives, in terms of employment outcomes and the mismatch between their education and skills and their job. Examining the extent and determinants of overqualification is very important not only because it reflects a limited utilisation of migrants' skills, but also because it can have negative long-term consequences on their skills levels. Given the availability of a wealth of information on this issue in the Survey of Adult Skills, this section will focus on overqualification and mismatch for tertiary-educated adults.

The likelihood of employment

Foreign-born adults have lower employment rates than native-born persons in all countries except Italy and the United States (Figure 8.13). The average difference is of the order of 5 percentage points in employment rates, but this varies greatly across countries. The greatest differences are found in Estonia and the Netherlands (13 percentage points), followed by Denmark, Sweden and France (9-10 percentage points). In Ireland, the United Kingdom, Finland, Canada and Australia, the differences are small, below 3 percentage points. In Italy (the United States), immigrants have employment rates that are about 4 (2) percentage points higher than those of the native-born. In Sweden, Germany and Austria, migrants have overall high employment rates

(between 70 and 74%) but despite that, they lag significantly behind native-born persons, with employment gaps of the order of seven to 9 percentage points. In contrast, in the crisis-hit countries which have low overall employment rates in the population, the employment gap between migrants and natives is rather small or even positive. This is the case for example in Ireland, Spain and Italy.

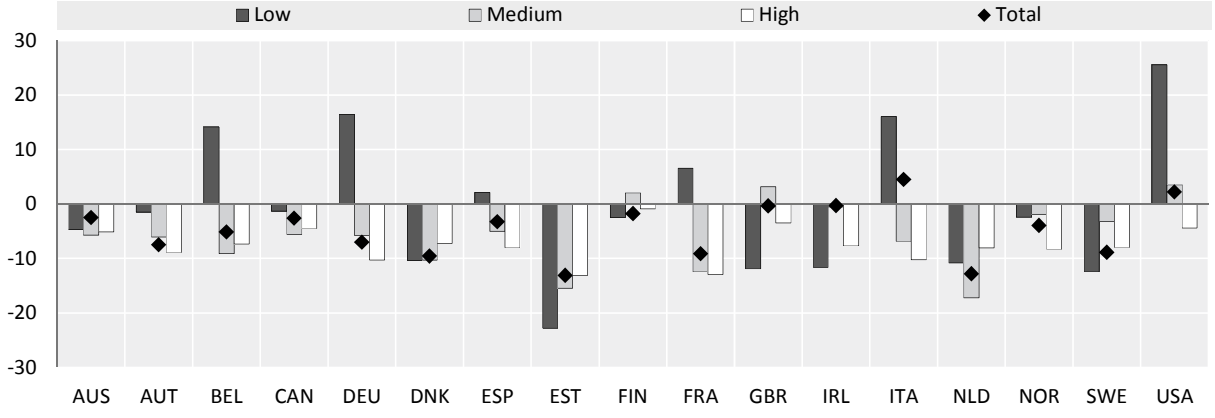
The differences across countries are to a large extent driven by the composition of the migrant and native groups in terms of their educational attainment. In the United States, Italy, Belgium, and Germany and to a lesser extent France and Spain, foreign-born migrants with less than secondary education are more likely to work than their native-born counterparts. In the United States, the United Kingdom, Norway and Sweden the differences are also small (either positive or negative) for persons with medium levels of education.

In addition to educational attainment, other key characteristics of migrants such as duration of stay in the country, the country where the highest qualification was obtained, the age at arrival and their country of origin (EU versus non-EU) are also important determinants of their employment rates and the extent to which these differ from those of similar native-born persons. This section only focuses on some of these characteristics. Additional analysis can be found in the annex.

First, there are marked differences in the employment rates between migrants who are native-speakers of the host-country language and those who are not (Figure 8.14). In most countries, foreign-born migrants who are native speakers of the host-country language, have employment rates which are not statistically different from those of native-born persons. In contrast, migrants who are not native speakers of the host-country language, have lower employment rates than natives in all countries except the United States (as well as Estonia, the United Kingdom and Italy where the differences are not statistically different from zero).

Figure 8.13. Differences in employment rates between migrants and natives, by education level

Percentage points

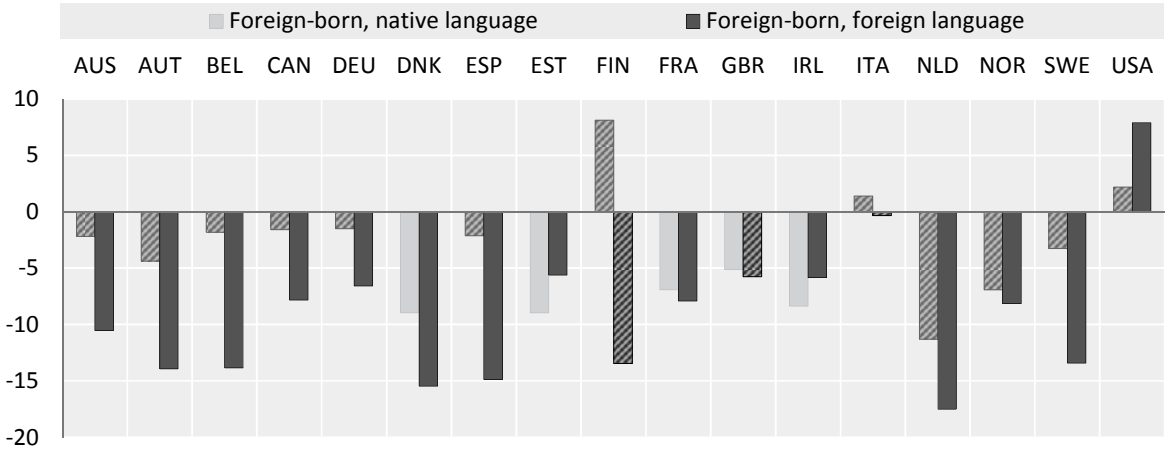


Note: The sample includes persons 16-65 who are not in formal education. Low education corresponds to less than upper secondary, medium education to upper secondary and high education to tertiary education.

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.14. Differences in employment rates between migrants and natives, by native/foreign language

Percentage points



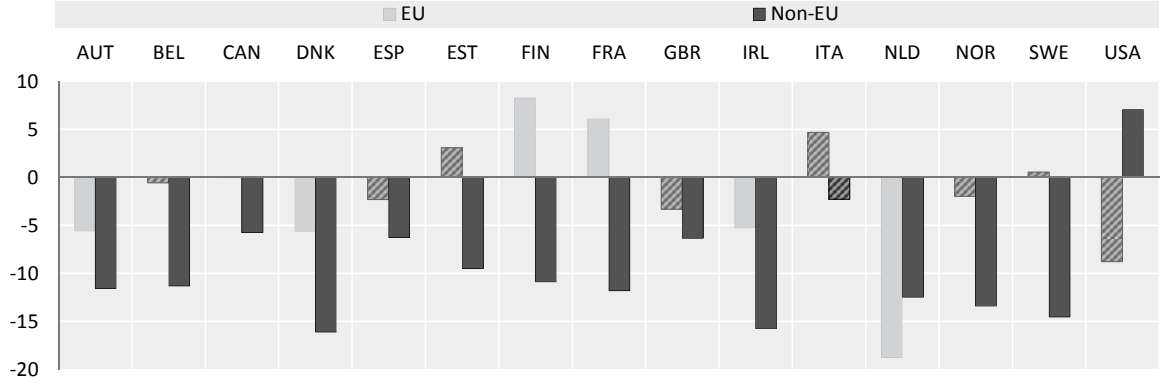
Note: The sample includes persons 16-65 who are not in formal education. The coefficients presented in the figure are from separate regressions which include controls for age, gender, level of education and level of parental education. Language is defined on the basis of the languages the migrant has learned as a child and still understands or those spoken at home. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

Second, migrants from EU countries have in many countries employment rates which are fairly comparable to those of native-born persons. In Finland and France, they actually have higher employment rates than natives, while in the Netherlands they tend to have an employment disadvantage in comparison both with natives and to some extent also with immigrants from non-EU countries. In all countries in Figure 8.15 except the United States, non-EU migrants have a lower employment rates than native-born persons.

Figure 8.15. Differences in employment rates between migrants and natives, by EU/non-EU origin

Percentage points

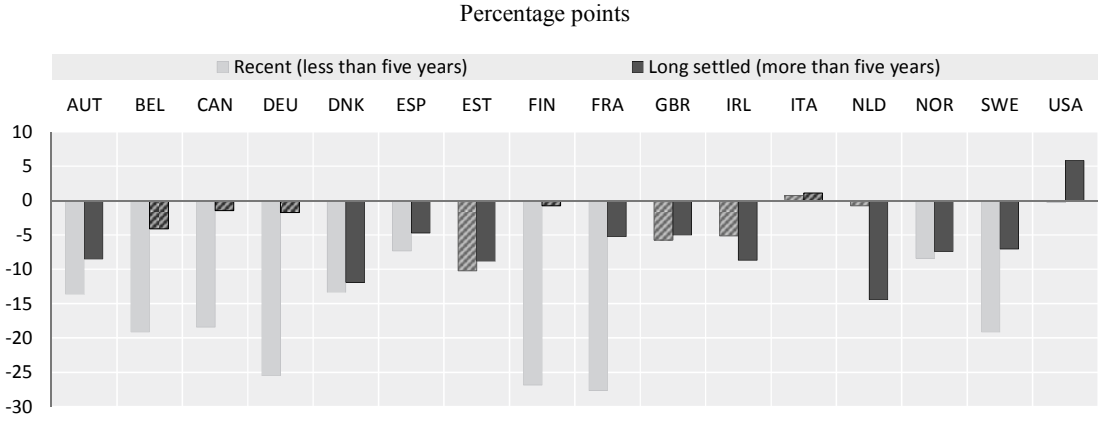


Note: The sample includes persons 16-65 who are not in formal education. The coefficients presented in the figure are from separate regressions which include controls for age, gender, level of education and level of parental education. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

Third, the difference in employment rates is sharp between recent migrants and natives (but also long-settled migrants) in Canada, Germany, Finland, France and Sweden (Figure 8.16). In another group of countries (Austria, Denmark and Norway) the differences are much smaller and overall the employment gap between migrants and natives is smaller. In the United States, long-settled migrants enjoy higher employment rates than natives.

Figure 8.16. Differences in employment rates between migrants and natives, by duration of stay



Note: The sample includes persons 16-65 who are not in formal education. The coefficients presented in the figure are from separate regressions which include controls for age, gender, level of education and level of parental education. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

Table 8.3 presents the results of a basic analysis of the probability of employment which includes controls for age, education and literacy proficiency, as well as a foreign-born dummy, a dummy variable for qualifications acquired abroad and an indicator for speaking the host-country language. In all countries, there is a positive and statistically significant association between the education level and literacy proficiency on the one hand and the probability of employment on the other. Having a foreign qualification is associated with a lower probability of employment in Finland and the Netherlands, implying some imperfect transferability and understanding by employment of foreign credentials. In contrast, in the United States and to some extent in Estonia, migrants with a foreign qualification have on average higher chances of employment, a result which may be linked to selective immigration policies in the first. Speaking the host-country language is positively associated with the likelihood of employment, but the results are only statistically significant in Canada and Finland, suggesting that literacy proficiency is possibly taking such language skills into account in the other countries.

Once all these relevant factors have been accounted for, the remaining gap in employment rates between migrants and natives becomes insignificant in most countries. In Denmark, France and Ireland there is a remaining employment gap but this is significantly reduced in comparison with the raw differential presented in Figure 8.13. Finally, the results for Finland suggest that the composition of migrants in terms of education, literacy proficiency and other key characteristics can explain the negative employment gap presented in Figure 8.13. Once these factors have been taken into account, migrants are on average more likely to be employed than similar native-born persons.

Table 8.3. What drives the probability of employment?

	Medium education	High education	Foreign-born	Foreign qualification	Host-country language	Literacy
Australia	0.098176 ***	0.171437 ***	-0.0123		0.051682	0.000936 ***
	(0.0197)	(0.021)	(0.0169)		(0.0336)	(0.0003)
Austria	0.126265 ***	0.175725 ***	-0.02193	-0.03342	0.053449	0.000781 ***
	(0.0187)	(0.0235)	(0.0297)	(0.0418)	(0.0383)	(0.0001)
Belgium	0.141102 ***	0.215359 ***	-0.01097	-0.02549	0.052336	0.000577 ***
	(0.0184)	(0.0207)	(0.0414)	(0.0558)	(0.0351)	(0.0002)
Canada	0.144035 ***	0.191378 ***	-0.00122	-0.0093	0.036373 **	0.000747 ***
	(0.0195)	(0.0203)	(0.0153)	(0.0187)	(0.0177)	(0.0002)
Denmark	0.099599 ***	0.162231 ***	-0.05655 **	0.008925	0.029705	0.001313 ***
	(0.0186)	(0.0202)	(0.0236)	(0.0276)	(0.0334)	(0.0002)
Estonia	0.165182 ***	0.272134 ***	-0.09578 ***	0.053373 *	-0.02455	0.000765 ***
	(0.0164)	(0.0184)	(0.0215)	(0.0315)	(0.0364)	(0.0002)
Finland	0.121665 ***	0.185693 ***	0.142847 ***	-0.10568 *	0.104954 **	0.001389 ***
	(0.0238)	(0.0231)	(0.041)	(0.0624)	(0.0532)	(0.0002)
France	0.121205 ***	0.207289 ***	-0.05588 **	0.008338	0.027935	0.000454 ***
	(0.0155)	(0.0175)	(0.0265)	(0.0314)	(0.031)	(0.0003)
Germany	0.201423 ***	0.261478 ***	0.006108	-0.02152	0.023215	0.000981 ***
	(0.0276)	(0.0287)	(0.0322)	(0.0361)	(0.0401)	(0.0003)
Ireland	0.129442 ***	0.277668 ***	-0.0514 *	-0.03012	-0.05838	0.001048 ***
	(0.0217)	(0.0249)	(0.0278)	(0.0335)	(0.037)	(0.0003)
Italy	0.09029 ***	0.223044 ***	0.040704	-0.04058	-0.03077	0.000717 ***
	(0.0232)	(0.0274)	(0.055)	(0.073)	(0.0587)	(0.0002)
Netherlands	0.083216 ***	0.13289 ***	-0.03666	-0.10698 **	0.045826	0.000585 ***
	(0.0168)	(0.0188)	(0.034)	(0.0506)	(0.0575)	(0.0003)
Norway	0.111119 ***	0.161103 ***	-0.04767	0.013758	-0.01161	0.00109 ***
	(0.0206)	(0.0196)	(0.0307)	(0.0426)	(0.0421)	(0.0003)
Spain	0.122407 ***	0.209601 ***	-0.06602	0.043792	0.014806	0.000802 ***
	(0.0183)	(0.0173)	(0.0443)	(0.0462)	(0.0344)	(0.0002)
Sweden	0.132633 ***	0.15033 ***	0.010701	0.015182	0.056821	0.001597 ***
	(0.0204)	(0.0208)	(0.029)	(0.0378)	(0.0368)	(0.0002)
United Kingdom	0.097851 ***	0.149764 ***	-0.03557	-0.00699	-0.03106	0.000975 ***
	(0.0217)	(0.0201)	(0.0309)	(0.0427)	(0.0463)	(0.0002)
United States	0.128667 ***	0.211944 ***	-0.01968	0.141483 ***	-0.0187	0.001094 ***
	(0.0294)	(0.0324)	(0.0314)	(0.0328)	(0.036)	(0.0002)

Note: The coefficients are derived from linear probability models, where the dependent variable is a dummy variable taking the value one if the person is employed and zero otherwise. The coefficients should be interpreted as the percent change in the probability of employment as a function of the independent variable. For instance, the coefficient of medium education for Australia indicates that medium-educated persons have 9.8% higher chance of being employed than those with low level of education. The sample includes persons 16-65 who are not in full-time education. Standard errors in brackets. *** p<1% ; ** p<5%; * p<10%.

Source: Survey of Adult Skills (PIAAC) 2012.

How well are workers' skills matched with those required in the jobs they hold?

Having examined the employment probability of migrants relative to that of natives, we turn next to how migrants are faring relative to natives, in terms of the mismatch[13] between their education and skills and their job. Examining the extent and determinants of overqualification is very important not only because it reflects a limited utilisation of migrants' skills, but also because it can have negative long-term consequences on their skills levels. Given the availability of a wealth of information on this issue in the Survey of Adult Skills, this section will focus on overqualification and mismatch for tertiary-educated adults. We have chosen to focus on this specific group as tertiary education is used by many countries to select high-skilled migrants. The question is hence whether these migrants are indeed employed in occupations that correspond to their educational credentials and if their skills are fully utilised in the labour market.

An indicator of labour market success which has been used in the literature concerns the matching between one's jobs and his/hers educational credentials. The main finding in the related literature suggests that the incidence of mismatch is higher among foreign-born than

native-born persons and this is also true for tertiary-educated persons. This section examines the incidence of overqualification among migrants and natives and analyses its determinants. It also attempts to explain the differences between the two groups using information such as literacy and numeracy skills, the country where the qualification was acquired, the age at migration and the duration of stay in the host country. In addition, it makes use of the available information in the Survey of Adult Skills to construct different measures of overqualification and in particular of skill mismatch.

Definitions and measurement issues

The term mismatch refers to a situation where a worker's professional skills do not meet the skill requirements of the job occupied, whereby several types of mismatch are distinguished (e.g. McGuinness and Sloane, 2011). A thorough discussion of definitions and measurement of mismatch can be found in the *Employment and Social Developments in Europe 2012* review of the European Commission (European Commission, 2012). A horizontal mismatch, which will not be considered in this chapter, refers to workers who are educated in another field than their job requires.[14] A vertical mismatch refers to workers possessing an education that either exceeds or is below the educational level required for their jobs. Here, the terms overeducation/overschooling and undereducation are used (Tijadens and van Klaveren, 2011). The phenomenon of overqualification has been studied much more in depth than the one of underqualification, because of fears that it may have been caused by the increased supply of university and college graduates over the past few decades in several OECD countries. Indeed, research into the overqualification phenomenon dates back to the 1970s, when the "universalisation" of access to higher education led some people to fear that a growing imbalance in the supply of and demand for skilled labour would dilute the value of diplomas (Freeman, 1976). However, only starting from the 1990s the labour economics literature has taken an interest in analysing the incidence and effects of education mismatch for immigrants. The results of this body of research is that in all countries immigrants are on average more overeducated than natives in the jobs they hold, and hence receive lower returns to their education than natives (Piracha and Vadean, 2012). The literature on overqualification distinguishes between three types of approaches: "normative", "statistical" and "self-declared" (see Box 8.2). Irrespective of the approach used, educational level remains a crude measure to indicate an individual's educational attainment or job requirements. For jobs, the skill-based approach seems more adequate, as are the terms overskilling – i.e. the phenomenon whereby a worker's skills exceed those required by his/her job – and *skill deficit (skill gap)* – i.e. the inadequacy of a worker's skills relative to the requirements of his/her job.

Yet, owing to the difficulty of identifying good measures of intrinsic skills and the scarceness of databases that include such measures, skills are more difficult to measure than educational attainment. Some studies directly measure specific workers' skills and compare them with the level of the same skills required by the job they hold. Alternatively, skill mismatch is measured through self-assessment by workers who are asked whether they are able to use all their skills in their job – to measure skill underutilisation – and whether they would carry out their job better if they had additional skills – to assess skill deficits (Quintini, 2011). As a result, most of the research available on this topic is on overqualification.

Information provided in the Survey of Adult Skills enables to measure both overeducation and overskilling. Such a possibility represents a substantial added-value to the analysis of overqualification and mismatch. Indeed, as argued by Dumont and Monso (2007), there is evidence suggesting that differences in skills explain a large part of

overeducation. Therefore, comparing the incidence of overqualification with the one of skill-mismatch might shed some light on the reasons why migrants tend to be more overqualified than natives. In other words, qualification mismatch could partly be explained by skills heterogeneity among workers with the same level of formal education (see Section 8.2).

In the next section we present some descriptive statistics comparing the incidence of overqualification and overskilling among tertiary-educated natives and foreign-born, as well as among different groups of foreign-born. Such groups have been identified on the basis of the individual characteristics which are known, from previous studies, to affect migrants' likelihood of mismatch, notably time spent in the host country, age at arrival, migrant generation, place of acquisition of one's highest qualification, region of birth and familiarity with host-country language. Box 8.2 presents the information available in the Survey of Adult Skills allowing studying overqualification and skill mismatch. More specifically it presents the three measures of overqualification and the measure of skill mismatch used throughout the next section and explains how these measures have been constructed drawing on the variables available in PIAAC.

Box 8.2. Definitions of qualification and skill mismatch used in the literature and their application on the basis of the Survey of Adult Skills

Qualification mismatch

The "normative" approach uses an *a priori* presumed correspondence between education and occupations (e.g. Chevalier, 2003; McGoldrick and Robst, 1996). This is a measure used frequently in the literature, yet its arbitrary nature makes it debatable, especially if the same correspondence is imposed for all countries and for different periods of time. Indeed the content of diplomas of an apparently similar level in two different countries may differ, and within any given country, the value of a diploma may vary over time. In this study the ISCO occupational classification system devised by the International Labour Office (ILO) is used to establish linkages between levels of qualification and educational levels as designated by the International Standard Classification of Education (ISCED). The ISCO classification is condensed into three categories of jobs demanding low, intermediate and high skills. The same is done with the ISCED classification. On the basis of these categories overqualified tertiary-educated individuals are defined as those workers who hold an "intermediate" or "unskilled" job, i.e. a job which does not belong to one of the first three categories of the ISCO occupational coding: "Managers", "Professionals", "Technicians and associate professionals". This measure is presented in this chapter as the "OECD overqualification measure".

In the "statistical" approach, the distribution of education level is calculated for each occupation and employees who depart from the mean (Verdugo and Verdugo, 1989; Bauer, 2002) or mode (Kiker et al., 1997; and Mendes de Oliveira et al., 2000) by more than some *ad-hoc* value – generally, one standard deviation – are classified as over or underqualified. This approach has the advantage of always being available but suffer from several limitations: like the normative measure, it requires the assumption that all jobs with the same occupational title have similar educational requirements; it is sensitive to cohort effects, especially in the case of a rapid change in the educational level required for a given occupation; and results depend on the level of aggregation necessary to obtain a reliable distribution of education. In this study, we have calculated the mean educational level by country and occupation drawing on a four level educational variable and on a two digits ISCO variable.

The "self-declared" approach is based on individuals' opinions on whether their jobs match their level of education, either through direct questions or by asking individuals about the requirements of their current job (Sicherman, 1991; Sloane et al., 1999; Battu et al., 2000; and Dorn and Sousa-Poza, 2005). As highlighted by Dumont and Monso (2007) this measure is not free from drawbacks, as it may be subject to several sources of bias, such as how the question is worded or the impact of external variables. In PIAAC the question used to this purpose is "What is the required education level for your current job?" and is based on the ISCED classification. This definition corresponds to the "subjective measure of mismatch" reported in this chapter.

Box 8.2. Definitions of qualification and skill mismatch used in the literature and their application on the basis of the Survey of Adult Skills *(suite)*

Each of these approaches presents advantages and disadvantages. In order to have a more accurate measure of the phenomenon of overqualification is therefore necessary to compare the information provided by each indicator and read them in a complementary way. An interesting attempt in this direction has been made by Chevalier (2003) who used the "normative" method to determine whether an individual is overqualified and then employed a subjective question on the "satisfaction regarding the match between education and job" to divide the overqualified between: apparently overqualified (the normatively overqualified satisfied with their match) and the genuinely overqualified (the normatively overqualified unsatisfied with their match).

Skill mismatch

Like overqualification, skill mismatch can be measured through self-assessment. Workers are asked whether they are able to use all their skills in their job – to measure skill underutilisation – and whether they would carry out their job better if they had additional skills – to assess skill deficits. In the Survey of Adult Skills, the skill mismatch measure is based on the following questions

Question 1: "Do you feel that you have the skills to cope with more demanding duties than those you are required to perform in your current job?"

Question 2: "Do you feel that you need further training in order to cope well with your present duties?"

Respondents are considered overskilled if they answer positively to the first question and negatively to the second one.

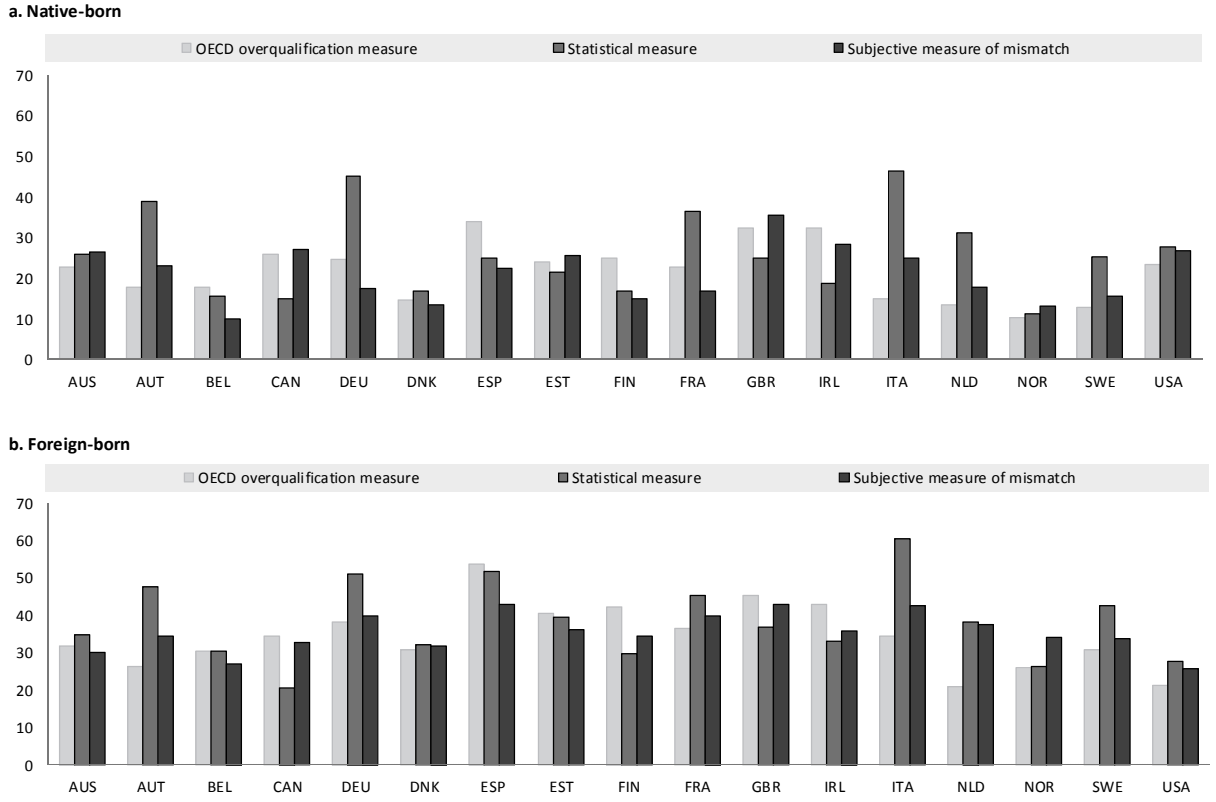
The incidence of overqualification and skill mismatch

Figure 8.17 shows the gap existing between the mismatch characterising tertiary-educated foreign-born persons and the one observed among highly skilled natives measured through the normative, the statistical and the self-declared approaches. Regardless of the approach used, highly educated migrants are overrepresented among the overqualified as compared to native-born virtually in all countries. Therefore, findings based on the Survey of Adult Skills go in the same direction as the results of previous research in this field of study (Damas de Matos and Liebig, 2012; Piracha and Vadean, 2012; Cedefop, 2011; Poot and Stillman, 2010; Dumont and Monso, 2007; Green et al., 2007; Lindley and Lenton, 2006; Battu and Sloane, 2002 among many others).

The second aspect leaping out from Figure 8.17 is that, depending on the specific country considered, disparities between the different approaches to the measurement of overqualification can be either very small, as in the Austrian, Canadian, Danish, Belgian, French, Swedish and the United States cases or extremely pronounced, as in the Dutch and German cases. It is noteworthy that in about half of the countries in Figure 8.17, the self-declared measure yields higher values of the mismatch gap between foreign-born and natives as compared to the other two approaches. This is particularly evident when looking at Germany and the Netherlands, and, to a lesser extent, at Norway. On the other hand, the statistical approach yields lower values of the mismatch gap in half of the analysed countries and above all in Finland and Germany. A third pattern concerns the similarity between the information provided by the statistical and the normative measures in about half of the examined countries, i.e. Australia, Austria, Denmark, the United Kingdom, Estonia, Ireland, Norway and Sweden. This is of no surprise since, as pointed out by Dumont and Monso (2007), statistical and normative approaches are *de facto* quite similar.

Figure 8.17. The incidence of overqualification, by place of birth

Percentage of the tertiary-educated employed population



Note: The sample includes the tertiary-educated employed aged 16 to 65. The definitions of the different measures can be found in Box 8.2.

Source: Survey of Adult Skills (PIAAC) 2012.

It is important to consider that the mismatch rates reported in Figure 8.17 are affected by the sample design developed by each surveyed country. It is therefore useful to compare overqualification rates computed using the Survey of Adult Skills with those calculated on the basis of another well-known international survey, such as the labour force survey for the year 2010. Box 8.3 goes deeper into this comparison.

In spite of the differences in the information provided by the three employed measures of overqualification, countries can be categorised into two main groups. The first group includes countries where the mismatch gap between immigrants and natives does not exceed the 15 percentage points, i.e. Australia, Austria, Canada, the United Kingdom and Ireland, while the second encompasses countries where the gap is more pronounced, often approaching and even overcoming 20 percentage points. Figure 8.17 also shows that migrants' probability of mismatch is particularly high in the Nordic countries – i.e. Finland, Sweden, Denmark and Norway – as well as in Italy and Spain. As argued by Dumont and Monso (2007), the reasons why migrants are more likely to be overqualified in Nordic countries are very different from those explaining migrants' high risk of mismatch in Southern Europe and are related to composition of the migrant populations in the two countries, as well as in the different structure of their labour

markets. In Southern Europe, immigration is a recent phenomenon, and consists essentially of workers who are apparently ready to accept the numerous unskilled jobs available upon arrival, with the hope of subsequent upward professional mobility. In the Nordic countries and, above all, in Norway and Sweden, migrants' population is largely made up of refugees who are relatively highly skilled but who face special problems connected to their status (sudden and fortuitous migration, slow or partial certification of their education level and occupational qualifications, uncertainty as to the end of their stay, etc.), which may be compounded by language problems.The outlier is the United States where, according to all three overqualification measures, foreign-born are as overqualified as natives or less. This is in line with what found by Chiswisk and Miller (2009c) and Damas de Matos and Liebig (2012).

Box 8.3. Overqualification rates of tertiary-educated: A comparison between the labour force survey (LFS), the American Community Survey (ACS) and the Survey of Adult Skills

The table below shows the difference between overqualification rates among tertiary-educated foreign-born and natives, computed using LFS data and the Survey of Adult Skills, for countries which are included in both datasets. In comparison with LFS data, the Survey of Adult Skills produces considerably higher overqualification rates of foreign-born residing in Czech and Slovak Republics, Germany, Denmark, France, Finland and, to a lesser extent, in Spain. On the contrary, it largely underestimates the incidence of overqualification among foreign-born residing in Italy and in the United States and, to a lesser extent, in the Netherlands. Differences between the two datasets are quite pronounced also when native-born persons are considered. In this case the most relevant disparities concern the Czech Republic, Germany and Finland where, relative to the labour force survey (LFS), the Survey of Adult Skills (PIAAC) overestimates overqualification rates and the United States. For the latter country, however, the Survey of Adult Skills underestimates the incidence of overqualification as compared to the American Community Survey (ACS).

Difference between overqualification rates among tertiary-educated foreign-born and natives

	Foreign-born		Native-born		Ratio native-born/foreign-born	
	LFS 2010/ACS2010	PIAAC	LFS 2010/ACS2010	PIAAC	LFS 2010/ACS2010	PIAAC
Austria	27	26	21	18	0.78	0.69
Denmark	22	31	14	14	0.64	0.45
Estonia	40	40	21	24	0.53	0.60
Finland	31	42	17	25	0.55	0.60
France	36	23	20	22	0.56	0.96
Germany	31	38	19	24	0.61	0.63
Ireland	39	43	28	32	0.72	0.74
Italy	49	34	14	15	0.29	0.44
Netherlands	25	21	15	13	0.60	0.62
Norway	26	26	11	10	0.42	0.38
Spain	50	54	31	34	0.62	0.63
Sweden	32	31	11	13	0.34	0.42
United States	36	21	35	23	0.97	1.10

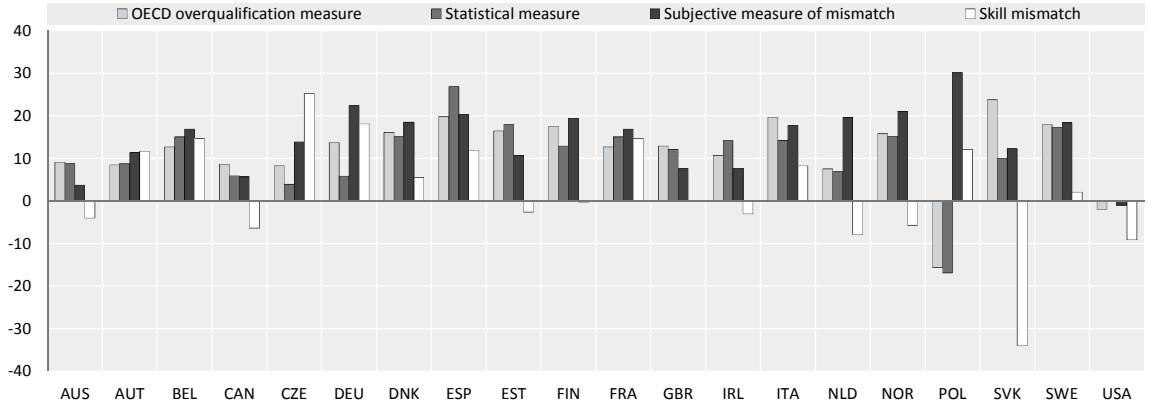
Source: Survey of Adult Skills (population 16-65), Labour Force Surveys 2010 (population 15-64), American Community Survey 2010 (population 16-65).

Figure 8.18 compares the qualification mismatch gap between foreign-born and native-born with the skill-mismatch gap measured on the basis of respondents' self-perception. In 12 of the 17 countries in this figure, the mismatch gap between foreign-born and natives measured on the basis of their skills is lower than any other gap computed relying on the three measures of overqualification. More specifically, in seven

of these 12 countries – i.e. Australia, Canada, Estonia, Finland, Ireland, Netherlands and Norway – the skill mismatch gap is negative, signalling that perception of skill mismatch is more common among natives than among migrants. It is particularly interesting to compare the qualification mismatch gap based on the self-declared measure with the skill mismatch gap as they are both based on people's evaluation. In one case people are asked about the skills necessary to carry out their job, while in the other they are enquired about the educational level needed to get the job they carry out.

Figure 8.18. Differences in overqualification rates between migrants and natives, based on different indicators

Percentage points



Note: The sample includes persons aged 16 to 65. The definitions of the different measures can be found in Box 8.2.

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.18 suggests that, the perception of the foreign-born of having an educational level that exceeds the one required by the job they have, is not matched with a similar opinion that they have all the assessed or occupation-specific skills that are necessary to carry out their current job. The evidence might suggest that overqualified workers are only apparently overqualified for their job as in fact they lack a variety of the skills required to carry out a job corresponding to their qualifications. Such skills may be language skills, or country-specific soft skills and not necessarily skills that can be learned in formal education. Given this evidence, it seems useful to complement the analysis of mismatch based on overqualification measures with the analysis based on skill mismatch measure since in some cases they portray quite different realities.

So far we have analysed how the various approaches to mismatch measure between-countries differences in the mismatch rates of natives and foreign born. However, studies on groups of countries, such as OECD countries or EU countries (Cedefop, 2011), as well as studies focused on individual countries (see, for instance, Poot and Stillman, 2010 for New Zealand; Sanroma, Ramos and Simon, 2008 for Spain), indicate that migrants' individual characteristics – e.g. gender, duration of stay in host country, country of birth – represent the most important explanatory factors of the difference between migrants and natives in overqualification rates. Section 8.3 confirms that migrants are not a homogenous group and treating them as one can be misleading. Indeed their outcomes in the labour market vary according to a number of factors such as time spent in the host country, place of acquisition of formal qualification, age at migration, migrant generation and migrants' region of origin. In the section, on the basis of the normative measure of

overqualification, the probability of mismatch of migrant groups defined on the basis of these characteristics is compared with the one of natives.

Which migrant groups are more likely to be affected by overqualification?

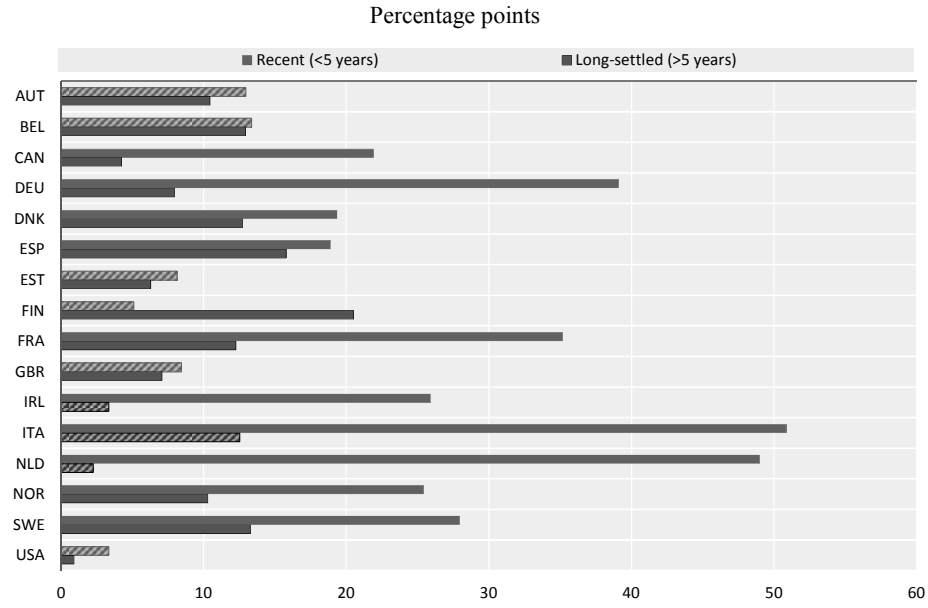
Existing evidence points out that the probability of overqualification is higher among workers that have recently entered the labour market. In this perspective, overqualification is part of an adaptation process in the early stages of a working career, when the worker needs to develop some key human capital endowments, such as ability, on-the-job training, or experience. Similarly to young people, migrants who have recently entered the host country labour market are therefore more likely to be more overeducated in their job than both natives and more established migrants. Studies focusing on specific countries substantially validate this hypothesis for Australia (Green et al., 2007), Canada (Wald and Fang, 2008) and the United Kingdom (Lindley, 2009) but not for Ireland and Spain. Indeed, Barrett and Duffy (2008) found that in Ireland recent migrants' probability of being overqualified is substantially the same as that of long standing migrants, while Fernandez and Ortega (2007) found that in Spain the higher incidence of overeducation characterising migrant workers does not appear to decrease after five years in Spain. Our analysis in addition to standard controls used in previous research, controls for literacy or numeracy skills and shows that in most countries the probability of being overqualified for migrants who have lived in the host country for five years or more is markedly lower than that for recent migrants.[15]

Relative to natives, the risk of being overqualified for recent migrants in Canada and Germany is five times that for migrants who have been in the country for longer. In France, Norway and Sweden, this is two to three times greater (Figure 8.19).The cases of Ireland, Italy and the Netherlands are also noteworthy. In these countries recent migrants' likelihood to be overqualified is strikingly higher than that of natives' but the probability of being overqualified of more established migrants is not statistically different from that of natives. The cases of Austria, the United Kingdom, Estonia, Finland and Belgium are more difficult to interpret. For these countries the coefficient for the dummy identifying recent migrants is not statistically significant while it is significant the one for established migrants. However, with the exception of Finland, the gap between their probability of being overqualified and that of natives is relatively small. Our results for Spain seem to confirm that acquiring more familiarity with the host-country labour market is less effective to reduce migrants' probability of overqualification than in other countries. Recent migrants' overqualification rate is 19 percentage points higher than that of natives while for more established migrants this is about 16 percentage points higher.

The role played by the amount of time migrants have spent in the host country can be assessed also by comparing the probability of overqualification of foreign-born who migrated when they were younger/older than six. The assumption here is that migrants who settled in the host country when they were younger than six have acquired all the host country specific human capital factors, regardless of their country/ language of origin by the time they enter the labour market. Our analysis confirms this hypothesis. Figure 8.20 shows that in nearly all surveyed countries, the probability of overqualification associated to migrants who settled in the host countries as preschool children is not statistically significant. Only in Italy, it is negative (and significant). The coefficient associated to migrants who moved at an older age, instead, is significant and positive. For instance, moving to France, Norway and Sweden at an age greater than six years old increases the overqualification rate by 15-25 percentage points. The disparity existing between the two groups of migrants relative to natives is particularly pronounced

in Italy. Migrants who moved to Italy before the age of six are 13% less likely to be overqualified than natives; however foreign-born who settled in the country later on are 33% more likely to be overqualified than Italian-born persons.

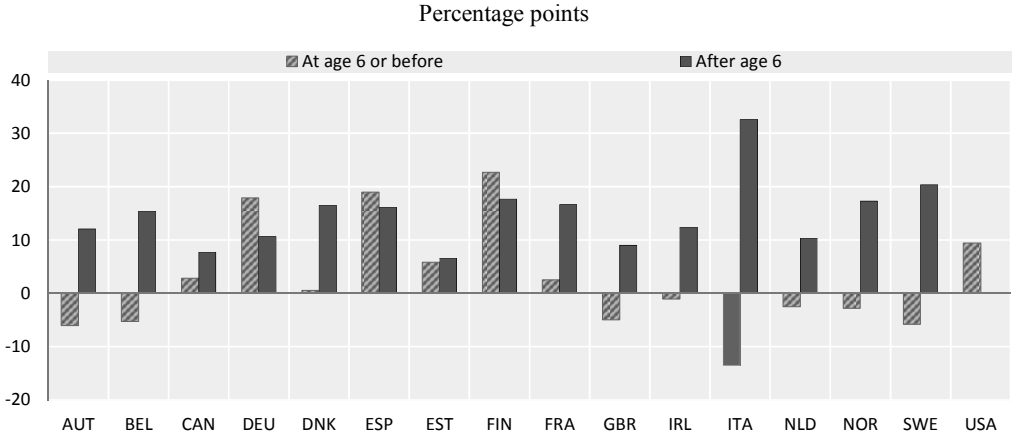
Figure 8.19. Difference in the overqualification rates between migrants and natives, by time spent in the host country



Note: The sample is restricted to tertiary-educated employed individuals aged 16-65. The estimated model is a linear probability model which includes controls for age, gender, years of education, literacy skills and an intercept. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.20. Difference in the overqualification rates between migrants and natives, by age at arrival

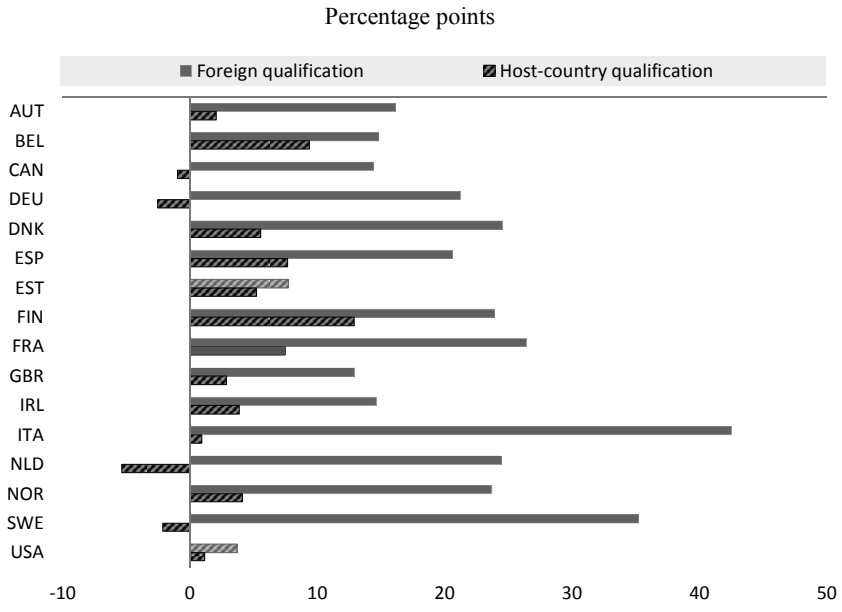


Note: The sample is restricted to tertiary-educated employed individuals aged 16-65. The estimated model is a linear probability model which includes controls for age, gender, years of education, literacy skills and an intercept. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

Evidence for OECD countries shows that immigrants with foreign education have higher rates of overeducation. Similar evidence is found for European countries (Aleksynska and Trithah, 2011) and Denmark (Nielsen, 2011). Figure 8.21 depicts the overqualification rates of migrants relative to natives distinguishing between migrants who completed their tertiary education in the host country and those who did it abroad and confirms the other evidence in the literature. The latter have significantly higher chances to be overqualified than natives in virtually all countries and especially in Italy and Sweden. On the other hand, only in France the difference between the overqualification rates of migrants who acquired their highest qualification in their host country and those of natives is statistically significant and positive (hence the striped bars for most countries in Figure 8.21).

Figure 8.21. Difference in the overqualification rates between migrants and natives, by place of acquisition of highest qualification



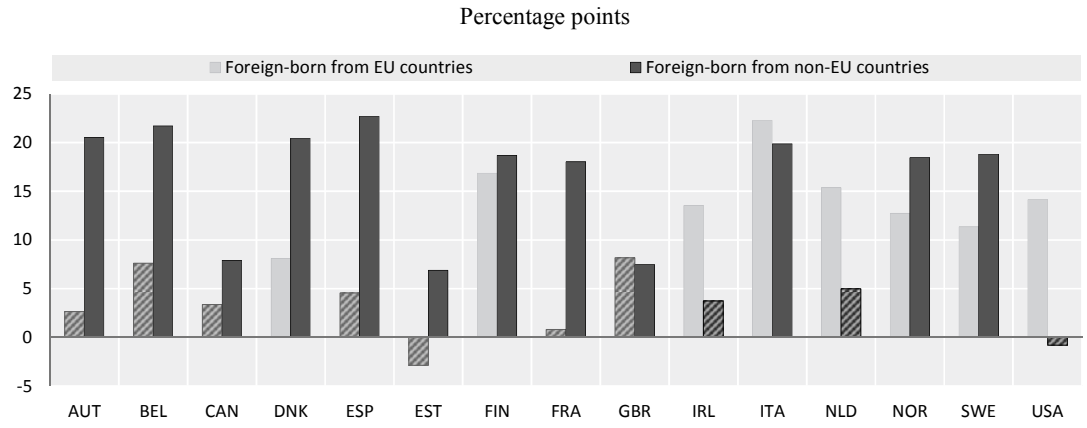
Note: The sample is restricted to tertiary-educated employed individuals aged 16-65. The estimated model is a linear probability model which includes controls for age, gender, years of education, literacy skills and an intercept. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

The negative returns to foreign-qualifications are expected to be smaller in the case of intra-EU migration. Migrants from EU countries benefit from free movement in the EU area, which also includes a number of provisions to foster transferability of formal qualifications. Therefore it is interesting to compare the probability of overqualification of migrants from EU and non-EU countries both within EU countries and in non-EU countries. If we first focus on EU countries, data reported in Figure 8.22 point out that in Nordic countries both EU and non-EU migrants present a higher probability to be overqualified than their native peers but that such gap is more pronounced for non-EU migrants, although the differences are not huge. This may be due to the composition of migrants in these countries in terms of their origin country: an important share of EU migrants are from neighbouring countries who speak the host-country language and/or have actually studied in the host country. In Austria, Estonia, Spain, the United Kingdom, Belgium and France, the difference between the probabilities of mismatch of EU migrants and natives is not statically significant, while non-EU migrants have a

significantly higher probability of mismatch as compared to natives, above all in Austria, Belgium and France where it exceeds 50%. The Netherlands and Ireland present a symmetrical situation. Only EU migrants have a statistically significant higher probability to be overqualified than natives. In Italy coefficients are significant for both groups and as compared to natives, EU migrants are slightly more likely to be overqualified than non-EU migrants. As far as non-EU countries are concerned, in Canada both groups of migrants have a slightly higher probability to be overqualified than natives but only the coefficient for non-EU migrants is significantly different from zero. On the contrary, in the United States, while being a migrant from EU countries increases the probability of overqualification by about 14 %, being a non-EU migrant is not associated with a higher probability of overqualification.

Figure 8.22. Difference in the overqualification rates between migrants and natives, by EU/non-EU origin



Note: The sample is restricted to tertiary-educated employed individuals aged 16-65. The estimated model is a linear probability model which includes controls for age, gender, years of education, literacy skills and an intercept. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

What factors contribute to overqualification and mismatch?

As shown above, tertiary-educated foreign-born persons are more likely than native-born persons to be overqualified in the jobs they hold. Understanding the factors contributing to such outcome is necessary for policy to act in order to reduce the incidence of mismatch among migrants. Many studies have estimated binary models of the determinants of overeducation for the entire population, without special focus on foreign-born persons. Most of this literature points to explanations related to job allocation frictions, such as workers' recent entry in the labour market; imperfect information from the employer's side; difficulty in capitalising one's human capital because of lack (or slow process) of formal recognition of one's qualifications as well as labour market discrimination practices. The relatively few papers which have focused on the situation of migrants show that most of these factors are more often found among migrants or specific groups of migrants, than among the native population. PIAAC enables to test the impact of such factors and allows enriching our analysis by investigating the role played by assessed skills on the probability of overqualification. This enables us to account both for the case in which ability and experience can substitute for a lack of education (Poot and Stillman, 2010) and the case in which formal educational attainments overestimate the actual abilities owned by a worker and how

these considerations may differ between foreign-born and native-born persons. In what follows we first investigate factors contributing to over qualification analysing natives and foreign-born separately in order to show the correlations between basic characteristics and overqualification and how these may differ between natives and migrants. Then, we pool the two groups together in order to assess the remaining differences between the two once key factors have been taken into account.

The results reported hereafter are based on the normative measure of overqualification in order to facilitate the comparison between the results of our analysis with those of previous studies based on this approach, such as Dumont and Monso (2007) and Damas de Matos and Liebig (2012).

Are there differences between migrants and natives in the determinants of overqualification?

Regressions based on the Survey of Adult Skills, estimated separately for foreign-born and native born, confirm a finding shared by a consistent body of the literature namely, that in all surveyed countries the incidence of overeducation is higher among young workers – i.e. among workers that have recently entered the labour market. This applies to foreign-born and native-born persons alike. The only exception is represented by Spain where middle aged native-born (aged 25-54) have a higher probability of being overqualified than native youth (age 16-24) and where foreign-born aged 25 and above are more likely to be overqualified than migrant youth.

The evidence provided by PIAAC about the relation between gender and overqualification is mixed. Looking at results for natives it emerges that in Austria, Canada, Estonia, Germany and Sweden, being a woman is associated with a smaller probability of being overqualified relative to men. In the United Kingdom and Finland the opposite holds true. Such mixed results are in line with evidence provided by the *OECD Skills Outlook 2013* (OECD, 2013b) and by previous empirical research that does not distinguish between foreign-born and native born population. Such studies find that women are more likely to be overqualified in their job than men but the difference is sometimes very small and the reverse has also been found (Quintini, 2011). As far as foreign-born are concerned, only for Estonia, Finland, Belgium, France and Italy the coefficient for the gender dummy is significant. Similarly to what emerges by the analysis of Dumont and Monso (2007), in all these countries such coefficient is positive, as the one for native-born women, but its magnitude is bigger. The Italian case is noteworthy since migrant women are 40 per cent more likely than migrant men to be overqualified.

In all countries under examination, the age and gender patterns of overqualification are similar for native-born and foreign-born persons. Table 8.4 shows that the same applies to the variable years of education. An increase in years of education is associated with a reduction of the probability of overqualification for all tertiary-educated individuals. The magnitude of such reduction is similar for natives and foreign-born in most of countries with some exceptions. In Denmark, the United Kingdom and Norway for every extra year of education the probability of overqualification decreases twice for foreign-born than for native-born. Also in Spain, Finland and Belgium the returns to education are stronger for migrants than for natives but the difference between the two groups is smaller. In Australia and Canada, two countries where migrants' educational level is particularly high due to the selective migration policies, returns to education are stronger for natives than for migrants.

Table 8.4. The demographics of overqualification, by place of birth

	Natives				Foreign-born			
	Ages 25-54	Ages 55-65	Women	Years of schooling	Ages 25-54	Ages 55-65	Women	Years of schooling
Australia	-0.297***	-0.299***	0.025	-0.089***	-0.228*	-0.256	0.031	-0.073***
	(0.074)	(0.08)	(0.024)	(0.011)	(0.127)	(0.136)	(0.036)	(0.012)
Austria	-0.015	-0.075	-0.140***	-0.103***	-0.425	-0.463	-0.041	-0.125***
	(0.081)	(0.084)	(0.022)	(0.009)	(0.534)	(0.548)	(0.075)	(0.024)
Belgium	-0.071	-0.095*	0.028	-0.074***	-0.122	-0.238	-0.063	-0.107***
	(0.048)	(0.054)	(0.019)	(0.01)	(0.348)	(0.358)	(0.109)	(0.026)
Canada	-0.207***	-0.193***	-0.080***	-0.087***	-0.217***	-0.216	0.023	-0.066***
	(0.045)	(0.049)	(0.016)	(0.005)	(0.073)	(0.083)	(0.031)	(0.006)
Denmark	-0.374**	-0.38**	0.007	-0.038***	-0.175	-0.231	0.034	-0.075***
	(0.163)	(0.161)	(0.02)	(0.006)	(0.185)	(0.198)	(0.054)	(0.011)
Estonia	-0.189***	-0.137***	-0.048**	-0.107***	-0.035	0.030	-0.158***	-0.119***
	(0.047)	(0.051)	(0.022)	(0.007)	(0.21)	(0.197)	(0.053)	(0.018)
Finland	-0.203*	-0.267**	0.073***	-0.088***	0.044	0	0.315***	-0.131***
	(0.113)	(0.113)	(0.021)	(0.005)	(0.169)	0	(0.11)	(0.02)
France	-0.128***	-0.155***	0.028	-0.037***	-0.127	-0.147	0.136**	-0.031
	(0.042)	(0.05)	(0.02)	(0.006)	(0.216)	(0.224)	(0.066)	(0.024)
Germany	-0.052	-0.028	-0.05*	-0.114***	0.512	0.373	0.071	-0.121***
	(0.099)	(0.097)	(0.027)	(0.006)	(0.533)	(0.549)	(0.085)	(0.023)
Ireland	-0.248***	-0.319***	-0.007	-0.119***	-0.160	-0.225*	0.092	-0.13***
	(0.064)	(0.075)	(0.027)	(0.015)	(0.094)	(0.128)	(0.059)	(0.018)
Italy	-0.716***	-0.790***	0.004	-0.050**	-0.012	0	0.404***	-0.039***
	(0.149)	(0.153)	(0.037)	(0.023)	(0.376)	0	(0.191)	(0.052)
Netherlands	-0.224**	-0.221***	0.032	-0.042***	-0.770***	-0.857***	-0.003	-0.051***
	(0.073)	(0.08)	(0.021)	(0.011)	(0.059)	(0.085)	(0.076)	(0.017)
Norway	-0.260***	-0.281***	0.009	-0.049***	-0.302	-0.267	-0.009	-0.086***
	(0.061)	(0.064)	(0.019)	(0.006)	(0.422)	(0.405)	(0.063)	(0.015)
Spain	0.031	-0.041	-0.028	-0.116***	0.192*	0.391	0.030	-0.164***
	(0.072)	(0.079)	(0.028)	(0.007)	(0.109)	(0.181)	(0.076)	(0.032)
Sweden	-0.214**	-0.224***	-0.057***	-0.060***	0.187	0.081	0.059	-0.046***
	(0.09)	(0.087)	(0.019)	(0.008)	(0.135)	(0.166)	(0.056)	(0.017)
United Kingdom	-0.371***	-0.406***	0.097***	-0.041***	0.067	-0.021	0.063	-0.086**
	(0.053)	(0.065)	(0.026)	(0.013)	(0.154)	(0.187)	(0.067)	(0.041)
United States	-0.254***	-0.277***	-0.020	-0.069***	-0.112	0.028	0.033	-0.074***
	(0.068)	(0.064)	(0.022)	(0.006)	(0.237)	(0.297)	(0.063)	(0.015)

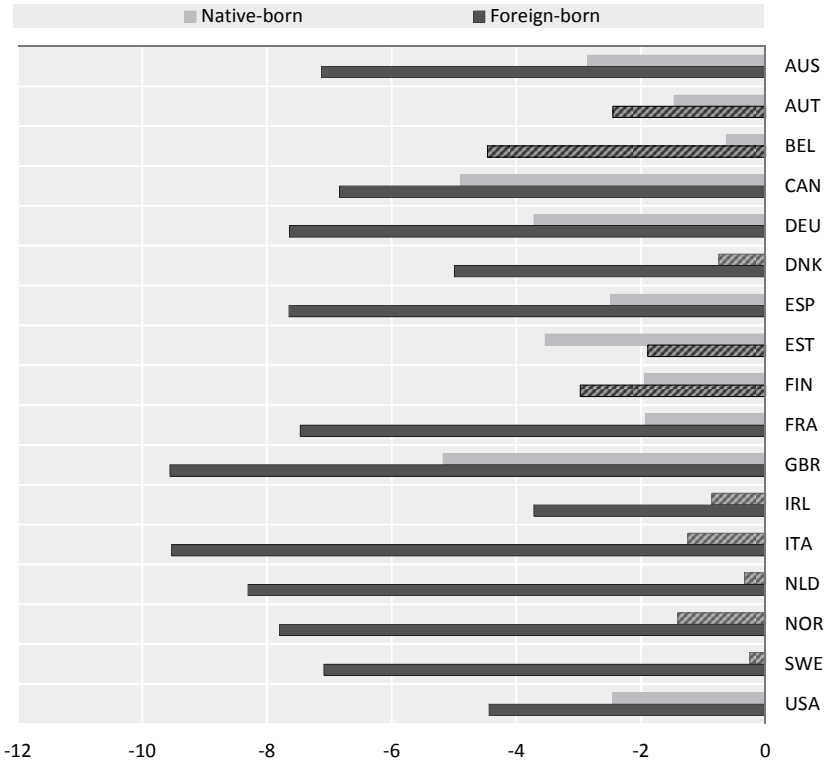
Note: The reference age category is youth (16-24). The coefficients are estimated from a linear probability model of an overqualification dummy based on the normative measure of mismatch. The coefficients should be interpreted as the percent change in the probability of overqualification as a function of the independent variable. For instance the coefficient of Age (25-54) for Australia indicates that persons aged 25-54 have 30% lower probability of being overqualified than those aged 16-24. Standard errors in brackets. *** p<1% ; ** p<5%; * p<10%.

Source: Survey of Adult Skills (PIAAC) 2012.

As illustrated in Figure 8.23, in all countries and for both groups of persons, the score reported in literacy skills and the probability to be overqualified are negatively correlated. Such a negative effect is stronger for foreign-born in all countries and, in particular, in the United Kingdom and Italy where the magnitude of the coefficient for foreign-born is respectively about twice and seven times bigger than the one for natives. As shown above, migrants' proficiency in literacy skills is affected by mastery of the host-country language. This explains why higher scores in literacy skills are more important for foreign-born than for natives to find a job that matches their qualifications. Italy, a country with no colonial past and whose migrants are therefore unlikely to speak Italian, seems to validate this hypothesis. Indeed mastery of host language and, therefore, better scores in literacy tests are in this country a rare asset but, probably for this same reason, a very powerful tool to reduce foreign-born overqualification.

Figure 8.23. The impact of literacy skills on the probability of overqualification by place of birth

Percentage points



Note: The sample includes tertiary-educated employed individuals aged 16-65. The estimated model is a linear probability model which includes controls for age, gender, years of education and an intercept. The striped bars indicate coefficients which are not statistically significant (at 10% level). The estimated coefficients have been multiplied by 25, which corresponds to half a level in literacy proficiency.

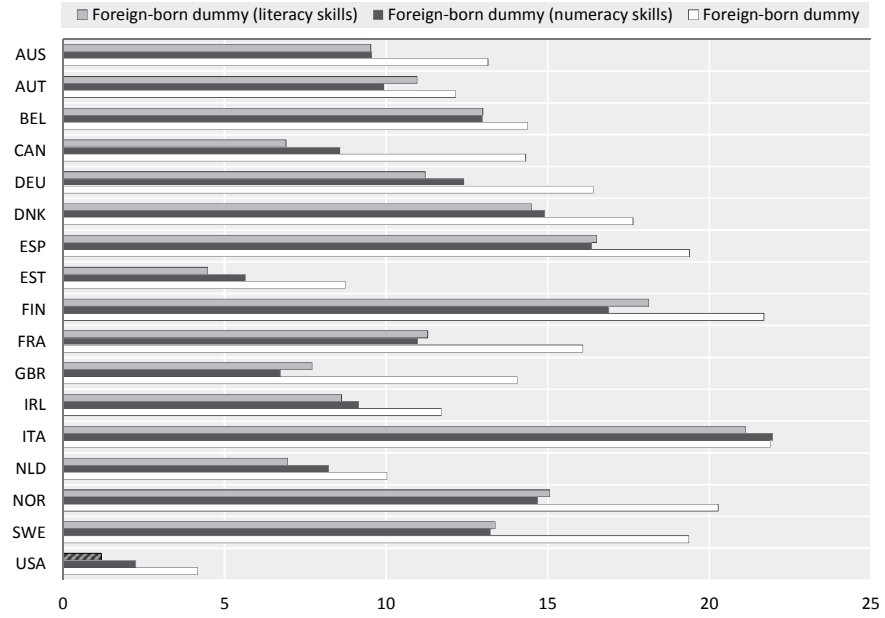
Source: Survey of Adult Skills (PIAAC) 2012.

What is the remaining gap between migrants and natives' overqualification rates?

Data reported in Figure 8.24 suggest that the probability of being overqualified for migrants is higher than that for natives in all countries examined. Such a probability is affected in a very similar way by proficiency in literacy and in numeracy. On average, in the countries reported in Figure 8.24, differences in literacy (numeracy) proficiency between migrants and natives account for about 30% (26%) of the differences in the overqualification rates between the two groups. In Canada, up to 50% of the initial gap between migrants and natives is due to differences in literacy levels, while in the United Kingdom, this is 45%. However, in Italy and Spain, differences in literacy proficiency between migrants and natives can only explain 4% and 15% respectively of the difference in overqualification rates.

Figure 8.24. Differences in overqualification rates between migrants and natives with and without differences in literacy and numeracy skills being accounted for

Percentage points



Note: The sample includes tertiary-educated employed individuals aged 16-65. The estimated model is a linear probability model which includes controls for age, gender, years of schooling and an intercept. The white bars correspond to a model which only accounts for these variables and includes a dummy variable for foreign born. The grey bars correspond to the coefficient of a dummy of foreign-born in a model which in addition to the factors mentioned above also controls for literacy proficiency. Similarly, the blue bars correspond to the foreign-born coefficient dummy in a model which controls for numeracy proficiency. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

The persistence of a gap in the likelihood of overqualification between immigrants and natives even when controlling for literacy and numeracy proficiency implies that other factors may be at work. For instance, as shown above the place where the highest qualification was acquired (in the host country or abroad) consistently affects migrants' risk of overqualification. Another variable that is expected to play an important role on the probability of mismatch is whether the person's language is the official language/s spoken in the host country.[16]

Table 8.5 illustrates the effect of these covariates on the foreign-born dummy. For both groups of regressions and in all countries except for Australia and France, the coefficient of the foreign-born dummy ceases to be significantly different from zero when controlling for these variables. This result confirms that imperfect information from the employer's side and imperfect transferability of human capital due to language dissimilarities between the migrant's home and host country do play a crucial role in explaining overqualification. It should be noted that in the case of Australia, there is not information on the country where the qualification was obtained and this might explain the remaining positive and statistically significant gap between migrants and natives. The coefficient for the dummy variable indicating familiarity with host-country language is not significant for most of countries. This might be due to the fact that this variable is too restrictive, since it does not take into account that people might master their host-country language even if it is different from the one spoken in their host country/in their family, because they studied it. Another reason for

this result can be the high correlation between this variable and the other variables included in the regressions, in particular, foreign-qualification and literacy proficiency. However for countries where the language dummy variable is significant, i.e. Sweden, Ireland, the United Kingdom, Canada, Australia and Austria, it is possible to observe that familiarity with host country language is associated with a reduction in the probability of mismatch with a magnitude ranging from 5% in Canada to 22% in Austria.

Table 8.5. The overqualification rates of migrants as compared to natives: The role of language and place of acquisition of the highest qualification

	FB dummy	FB dummy	Foreign Qualification	Host-country language
Australia	0.0953***	0.0737***	..	-0.0757*
	(0.026)	(0.026)	..	(0.045)
Austria	0.1097**	-0.0273	0.1183*	-0.2183***
	(0.044)	(0.052)	(0.070)	(0.071)
Belgium	0.1300**	0.0880	0.0420	-0.0570
	(0.051)	(0.084)	(0.098)	(0.057)
Canada	0.0690***	-0.0223	0.1403***	-0.0520*
	(0.053)	(0.069)	(0.082)	(0.088)
Denmark	0.1450	0.0620	0.1963***	0.0203
	(0.029)	(0.038)	(0.047)	(0.050)
Estonia	0.0447	0.0273	0.0470	0.0413
	(0.003)	(0.043)	(0.061)	(0.054)
Finland	0.1813***	0.1267	0.1080	-0.0077
	(0.054)	(0.081)	(0.116)	(0.084)
France	0.1130***	0.0653**	0.1773**	-0.0483
	(0.028)	(0.026)	(0.076)	(0.071)
Germany	0.1120**	-0.0360	0.2220**	-0.0550
	(0.044)	(0.059)	(0.085)	(0.094)
Ireland	0.0860**	-0.0017	0.0930*	-0.1487***
	(0.037)	(0.048)	(0.057)	(0.049)
Italy	0.2110**	-0.0040	0.3040**	-0.2617
	(0.083)	(0.071)	(0.141)	(0.226)
Netherlands	0.0697*	-0.0573	0.2827***	-0.0407
	(0.042)	(0.036)	(0.088)	(0.098)
Norway	0.1507***	0.0557	0.2080***	0.0373
	(0.031)	(0.045)	(0.054)	(0.06)
Spain	0.1650***	0.0830	0.1400	0.0673
	(0.057)	(0.091)	(0.102)	(0.076)
Sweden	0.1337***	-0.0467	0.3290***	-0.1177*
	(0.037)	(0.034)	(0.06)	(0.062)
United Kingdom	0.0770**	0.0060	0.0690	-0.1327*
	(0.042)	(0.06)	(0.062)	(0.077)
United States	0.0120	0.0287	0.0283	0.0657
	(0.038)	(0.05)	(0.062)	(0.051)

Note: The sample includes tertiary-educated employed individuals aged 16-65. The coefficients are estimated from a linear probability model of an overqualification dummy based on the normative measure of mismatch, controlling for age, gender, years of education, literacy proficiency and an intercept. The coefficients should be interpreted as the percent change in the probability of overqualification as a function of the independent variable. Standard errors in brackets. *** p<1% ; ** p<5%; * p<10%.

Source: Survey of Adult Skills (PIAAC) 2012.

An augmented model[17] takes into account the role of work-related factors in the probability of mismatch. More specifically, in addition to the control variables included in the previous regression, this model includes controls for firm size and type of contract (permanent versus temporary) as well as part-time work. Controlling for such variables does not affect the coefficient of the foreign-born dummy which, similarly to what we observed in the previous model, is significantly different from zero only for a small number of countries, notably is Australia, France and the Netherlands. This finding

suggests that work-related factors affect natives and foreign-born in a similar way and therefore are not useful to explain migrants' overexposure to the probability of overqualification on top of all other personal characteristics. In most of surveyed countries, workers with non-permanent contracts face a higher probability of mismatch. This might depend on the fact that fixed-term contract jobs tend to have lower qualification requirements than permanent jobs, but they often attract tertiary-educated workers who cannot find a permanent position. Firm size is negatively correlated to workers probability of being overqualified. One possible explanation for this is that firm size is a proxy for the quality of human resource policies, with larger firms being better at screening candidates and at understanding how overqualification may affect satisfaction at work and, ultimately, productivity. Large firms also have larger internal labour markets through which workers can be transferred to better matches inside the firm (OECD, 2013b) .The coefficient on full-time or part-time work is significant only for Australia, Canada, the United Kingdom, France, Sweden and the United States. In these countries employees working part-time are up to 13% more likely to be overqualified than full-time workers, signalling that part-time work tends to be more common in low–skilled occupations but they attract qualified workers because they are more compatible with personal/family life.

In conclusion, differences in overqualification rates between foreign-born and native-born persons are attributed to some extent to the detrimental effects of owning a foreign-qualification and, to some extent, to differences between migrants and natives' skills in the literacy (linguistic) and numeracy domain. Although these two factors can be highly correlated (as shown in Section 8.2), the results of the regressions reported in this section have shown that having a foreign qualification produces a negative effect in terms of overqualification even after controlling for workers' literacy skills. At the same time, work related factors seem to have little power in explaining the gap existing between the two groups.

8.5. The wages of migrants

The wages of migrants, their determinants, how they evolve over time in the country of residence and how they compare with those of similar native-born workers have for a long time interested researchers and policy makers for various reasons. First, the wages of migrants is an indicator of integration into the labour market as well as full and fair utilisation of their skills. Second, the analysis of wages allows examining the returns to education which are important determinants of individuals' incentives to investment in human capital. Moreover, wages in host countries (relative to those available in the origin countries) influence migration decisions and can be used by countries and employers to attract talent.

The existing literature on the wages of migrants covers a broad range of countries, but is often constrained by the data sources available that combine information on wages on the one hand with information on a person's country of birth and other relevant characteristics for migrants on the other. These data constraints make cross country comparative analysis rather difficult. An exception to this is the OECD (2008) overview of wage differentials between migrants and natives in nine OECD countries (Australia, Canada, Portugal, Germany, Sweden, France, Switzerland, the Netherlands and the United States). This analysis uses a variety of micro data sources, including survey data (labour force survey for some countries), register and administrative data.

The information available in the Survey of Adult Skills and the rich data on wages and earnings makes such analysis possible for a broader set of countries. In addition, the Survey of Adult Skills contains a rich set of questions relevant for migrants, which allows an analysis of immigrant wages accounting for the time they have spent in the country, their origin, their age at arrival as well as their literacy proficiency and language skills. In that respect, the Survey of Adult Skills is a unique source of information for the study of the wages of migrants and their determinants. Most papers estimate (Mincerian) wage equations as a function of education and professional experience (either actual professional experience or a computed proxy based on the age and age at which education was completed). Skills are proxied by highest educational attainment or by years spent in education (years of schooling) which are likely to mis-measure true skills, as also shown in Section 8.2 of this chapter. Instead, this chapter is exploiting the rich nature of the data in the Survey of Adult Skills to estimate the returns to schooling, professional experience and literacy proficiency separately for migrants and natives. It also distinguishes between migrants who have received their qualifications prior to migrating and those who hold host-country qualifications. Finally, it examines the wage gap between migrants and natives once all these relevant factors have been taken into account.

The wage gap between migrants and natives

In line with existing evidence (OECD, 2008), in two thirds of the countries in Table 8.6, foreign-born persons have on average lower wages than their native-born peers,[18] even after controlling for gender, years of professional experience, years of schooling and whether or not they gold part-time work. Migrants earn on average 17% and 16% less than similar natives in Spain and Italy respectively, while they earn 6% less in Sweden and Denmark. In Australia the earnings gap between migrants and natives is small and not significantly different from zero, a result which confirms the evidence in OECD (2008). Likewise, the migrant gap is not statistically significant in Germany, France, the Netherlands and the United States.

rsons, as shown in the last column of Table 8.6. This result can be explained by the evidence presented in Section 8.3 which shows that foreign-born tertiary-educated persons are on average more likely to be overqualified for the jobs they hold in comparison with similar native-born individuals. It may also be because the wage distribution is wider among tertiary-educated persons in comparison with persons with lower education levels. The only countries where there is no earnings differential between highly educated migrants and natives are Australia, Ireland and the United States. In Italy (Spain), highly educated foreign-born persons earn on average 32% (23%) less than their native-born counterparts. These are also countries with great differences in the likelihood of being overqualified between migrants and natives.

The earnings gap between migrants and natives is higher among tertiary-educated peThe analysis by the OECD (OECD, 2008) suggests that wage differences between immigrants and natives vary by country of birth. Immigrants from OECD countries tend to earn no less than native workers in most countries, while those from non-OECD countries earn less. Table 8.6 makes the distinction between EU and non-EU migrants (columns 2 and 3) and confirms previous analyses. In most countries, the negative wage differential between migrants and natives is confined to migrants coming from countries outside the European Union (this is the case in Austria, Finland, Belgium and the Netherlands). In Norway, Spain and Sweden both EU and non-EU migrants earn on average less than natives but the gap is greater for the latter. In Ireland, the United Kingdom and Italy, EU migrants have on average lower earnings than native-born

persons but also than their non-EU peers. In France, EU migrants earn on average higher wages than their non-EU but also native-born peers. In Ireland, more than two thirds of EU migrants come from the EU new members, while in Spain this share is 56%. These migrants find typically work in low-skilled occupations which do not correspond to their qualifications and this has implications for their salaries in comparison with those of non-EU migrants and native-born workers.

Table 8.6. Wage differences between migrants and natives

	All	EU	Non-EU	Tertiary educated
Australia	0.0079476	..	..	-0.02817
	(0.018)	..	..	(0.02682)
Austria	-0.09362 ***	-0.031004	-0.138715 ***	-0.13163 ***
	(0.02293)	(0.03195)	(0.02954)	(0.04464)
Belgium	-0.071454 ***	-0.050745	-0.095213 ***	-0.15648 ***
	(0.02683)	(0.0394)	(0.03416)	(0.05625)
Canada	-0.109152 ***	0.0013632	-0.139551	-0.16749 ***
	(0.01613)	(0.02443)	(0.01835)	(0.01942)
Denmark	-0.060694 **	-0.051013 **	-0.067535 *	-0.15965 ***
	(0.02767)	(0.02478)	(0.03812)	(0.03198)
Estonia	-0.116157 ***	-0.151612	-0.113999 ***	-0.16526 ***
	(0.03218)	(0.12019)	(0.03275)	(0.04724)
Finland	-0.110012 ***	-0.047177	-0.14581 ***	-0.18592 ***
	(0.03233)	(0.04175)	(0.04265)	(0.05777)
France	0.0266154	0.0810511 **	0.0066304	-0.12652 ***
	(0.0168)	(0.03658)	(0.01996)	(0.03593)
Germany	0.0143892	..	..	-0.17186 ***
	(0.04396)	..	..	(0.06082)
Ireland	-0.136694 ***	-0.184265 ***	0.0210777	-0.08576
	(0.03309)	(0.03717)	(0.05605)	(0.04447)
Italy	-0.161971 ***	-0.281748 ***	-0.083704	-0.31961 **
	(0.04223)	(0.05675)	(0.05292)	(0.1226)
Netherlands	-0.044581	0.0706318	-0.064956 **	-0.22254 ***
	(0.03298)	(0.16337)	(0.02923)	(0.04277)
Norway	-0.140136 ***	-0.121302 ***	-0.160272 ***	-0.17032 ***
	(0.02823)	(0.04376)	(0.03274)	(0.05322)
Spain	-0.17229 ***	-0.149666 **	-0.180545 ***	-0.22591 ***
	(0.04067)	(0.05998)	(0.04586)	(0.08177)
Sweden	-0.064854 ***	-0.013407	-0.09961 ***	-0.06228 **
	(0.0162)	(0.03034)	(0.01667)	(0.03042)
United Kingdom	-0.071209 **	-0.104533 **	-0.05364	-0.10481 **
	(0.02983)	(0.04213)	(0.03651)	(0.04411)
United States	0.0390381	0.0715191	0.0361874	-0.07997
	(0.07558)	(0.21741)	(0.07879)	(0.07479)

Note: Each cell in columns 1 and 4 is estimated in a separate regression with log wages as the dependent variable and represents the wage gap (in percent) between migrants and natives. For instance, the coefficient for Austria in the first column, indicates that migrants earn on average 9.3% less than natives with similar characteristics. The coefficients in columns 2 and 3 come from the same regression where instead of a dummy variable for foreign-born persons, two dummies have been used according to the country of birth of the individual (EU versus non-EU). The last column focuses on tertiary-educated persons only. All regressions include controls for years of experience (no distinction between that acquired in the host country and abroad), years of schooling, gender, a dummy variable for part-time work and an intercept. The sample includes persons aged 16 to 65. Wages are hourly wages, including bonuses. Standard errors in brackets. *** p<1% ; ** p<5%; * p<10%.

Source: Survey of Adult Skills (PIAAC) 2012.

The returns to schooling, literacy and numeracy skills

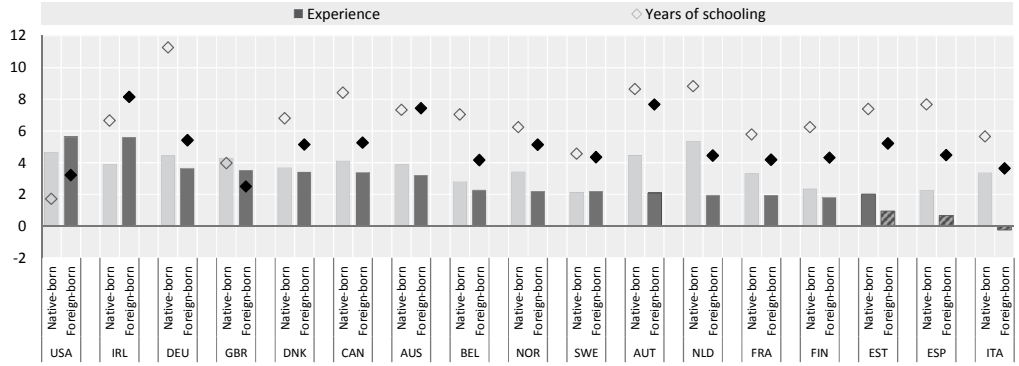
A well-established fact in the empirical literature is that migrants get lower returns to education than natives in terms of employment, occupational matching and earnings, and this irrespectively of the educational level and the category of entry. Possible explanations of this phenomenon include differences in the quality of the educational systems across countries, limited knowledge of the host-country language which does not allow migrants to get full rewards for their credentials, slow or non-recognition of foreign educational credentials and lastly discrimination. In addition, there are concerns about whether the available and commonly used measures of education do actually capture the real skills that migrants bring with them. This section, will mainly examine the role of language skills, along with rewards to educational credentials and professional experience in explaining wage gaps between migrants and natives.

In this section, we examine in detail the wage returns to schooling and educational attainment and analyse how these differ between immigrants and natives. Figure 8.25 presents the returns to years of schooling (linear) and years of experience (quadratic) in terms of wages, separately for migrants and natives, without accounting for literacy or numeracy proficiency. The results show that an additional year of schooling increases the wages of native-born persons more than those of the foreign-born, except in the United States and Ireland where the returns are higher for migrants than for natives and Australia where there is no difference between the two. These results could possibly reflect the fact that the model assumes constant returns to schooling (rather than decreasing). On average, the returns to schooling are about 7% for natives and 5% for migrant workers, but they vary greatly across countries. The highest returns to schooling (11% for every additional year) are found in Germany for natives, but for immigrants they are less than half of that. For migrants, schooling pays off more in Ireland, Austria and Australia in comparison with the other countries in Figure 8.25. Overall, there is less variation in terms of returns to education across countries among migrants than among natives.

Figure 8.26 presents the returns to higher education separately for foreign-born and native-born persons (Panel A) and then separately for migrants with host-country qualifications and those with foreign qualifications (Panel B). The results in this figure suggest that in most countries there are no major differences in the returns to higher education between immigrants and natives. However, important differences exist in Germany and Spain and to a lesser extent in the Netherlands, Estonia and the United Kingdom. In Germany, the returns for natives are the highest among the countries examined and twice those for migrants. The wage premium associated with higher education for migrants ranges from 30% in Finland to 64% in Austria. It is close to 30% in some Scandinavian countries (Denmark, Sweden) and Estonia and around 40% in the Netherlands, Germany, Spain and Norway. The lower returns to education for migrants relative to natives may be explained by either lower skills acquired in formal education for this group, a signal of lower quality in terms of unobserved characteristics in comparison with native persons or even some sort of discrimination. It may also reflect a greater probability of overqualification for migrants who are then find themselves more often than natives in jobs that offer lower returns to their formal qualifications.

Figure 8.25. The returns to experience and schooling, by place of birth

Percent increase in wages

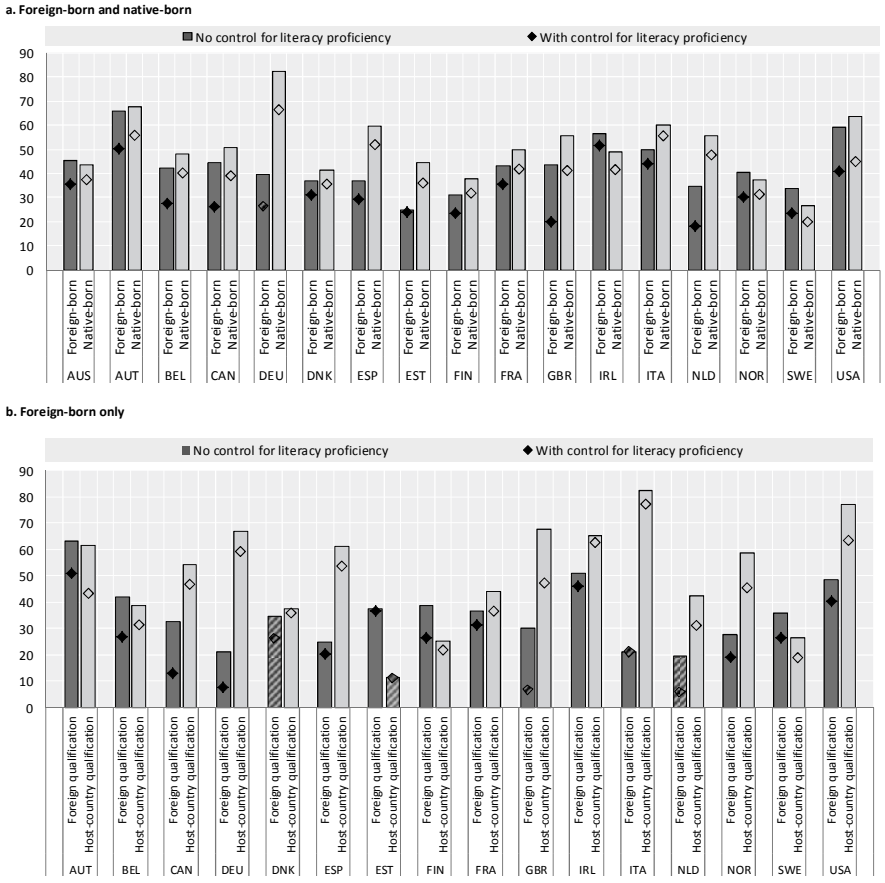


Note: The sample includes persons aged 16 to 65. The regressions are estimated separately with log wages as the dependent variable for foreign-born and native-born workers and include years of schooling, years of experience and experience squared, a dummy variable for part-time work, a gender dummy and an intercept.

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.26. The returns to tertiary education

Percent increase in wages



Note: The sample includes persons aged 16 to 65. The regressions are estimated separately with log wages as the dependent variable for foreign-born and native-born workers and include two dummies on educational attainment (high and medium), years of experience and experience squared, a dummy variable for part-time work, a gender dummy and an intercept.

Source: Survey of Adult Skills (PIAAC) 2012.

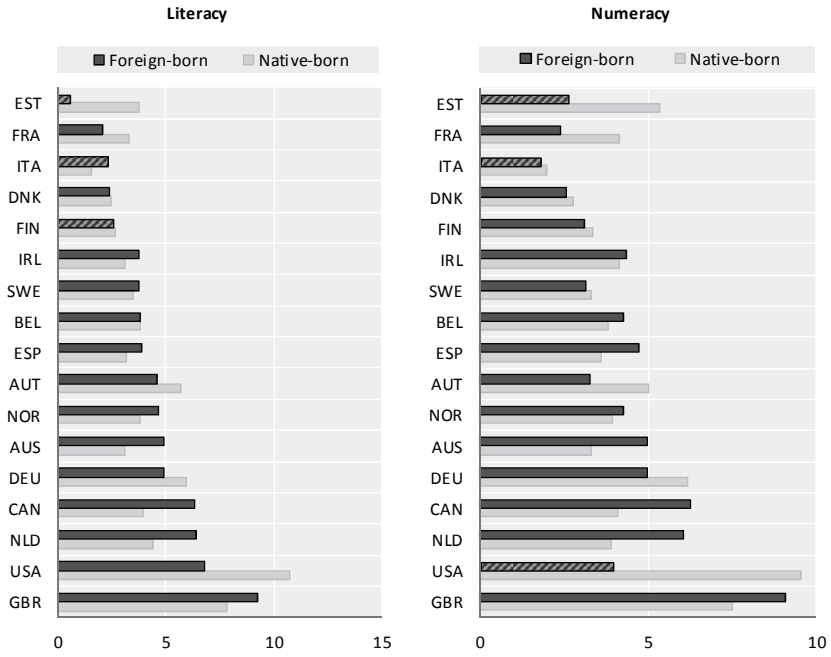
Even though literacy proficiency and educational attainment are strongly correlated, accounting for literacy proficiency in the regressions in Figure 8.26 (Panel A) should allow isolating the signalling effect of education. As expected, when controls for literacy are included in the regressions, the returns to higher education in Figure 8.26 decline both for migrants and for natives. In most countries, the returns to higher education for native-born persons are 20% lower when literacy skills have been taken into account. In the United States, Sweden, Belgium, Canada and the United Kingdom literacy skills pick up a greater share of the returns to formal education. For migrants, the returns to education become substantially lower both in comparison with the analysis without controls for assessed skills and in comparison with natives. In the United Kingdom, Belgium and Canada, controlling for literacy skills reduces by half the returns to higher education for migrant workers. In the United States, Sweden and Norway, these are about three quarters of their original magnitude. This finding could for example suggest that for at least some groups of migrants, higher educational attainment is only an imperfect signal to prospective employers. Once real skills have been accounted for, the returns to tertiary education (relative to low-levels of educational attainment) for migrants are lower than those for native workers. A separate analysis (Panel B in Figure 8.26) has been made focusing on migrants and distinguishing between two groups based on the country where the higher education was acquired. Indeed, in many countries, controlling for literacy skills, reduces the returns to tertiary education by more for migrants who have completed their education abroad in comparison with those who have studied in the host country.

A question that arises next concerns the rewards to literacy and numeracy proficiency and how these differ between migrant and native workers. According to the results in Figure 8.27 the returns to literacy and numeracy are positive and statistically significant both for migrants and natives, with some exceptions for migrants. Overall, an increase by 25 points in literacy proficiency (which is equivalent to half a level in literacy proficiency) corresponds to a wage increase by 4% for migrants. The highest returns to literacy and numeracy for migrants are found in the United Kingdom, the United States, the Netherlands and Canada, but they are small or not significantly different from zero in Estonia, France, Italy, Denmark and Finland. Overall, the results are very similar when numeracy is considered. Only notable exception is the United States, where the returns to numeracy for migrants are not statistically different from zero.

The results in Figure 8.27 suggest that in contrast to the returns to education, there are no major differences in the returns to literacy and numeracy between migrants and natives, in most OECD countries considered. However, some exceptions exist, notably the United States, which present the highest returns both to literacy and numeracy proficiency among natives, but those among migrants are either much smaller (two-thirds in the case of literacy) on not statistically significant (in the case of numeracy). Some differences in favour of migrants are found in Australia, Canada, the Netherlands and the United Kingdom where the returns are higher for migrants in comparison with natives, both for literacy and numeracy proficiency. However, it should be noted that the magnitude of the difference is rather limited. Moving up the literacy proficiency score by half a level, is associated with a wage increase which is 2 percentage points higher for migrants than natives.

Figure 8.27. The returns to assessed skills

Percent increase in wages



Note: The sample includes persons aged 16 to 65. The regressions are estimated with log wages as the dependent variable separately for foreign-born and native-born workers and include controls for schooling, years of experience and experience squared, a dummy variable for part-time work, a gender dummy and an intercept. The estimated coefficients have been multiplied by 25 which corresponds to half a level in the literacy proficiency score. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

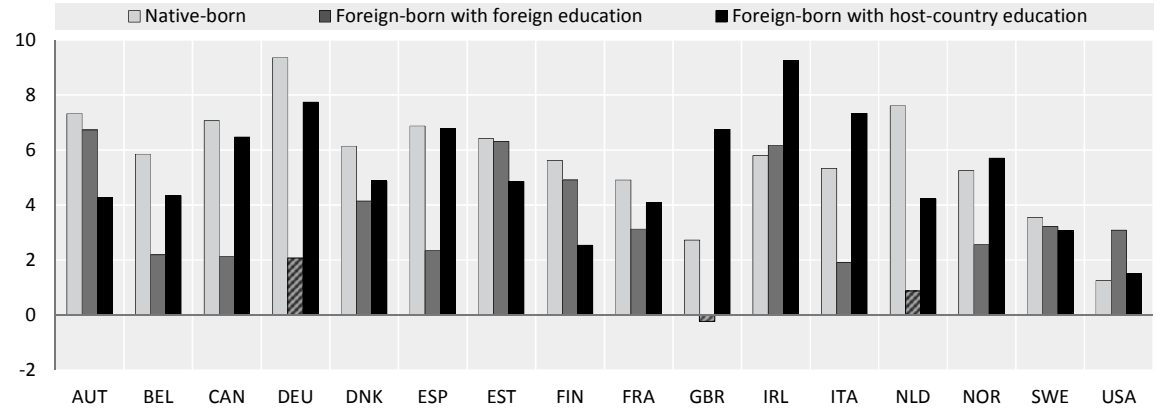
A crucial distinction between qualifications acquired in the host country and those acquired abroad

As already shown in Sections 8.2 and 8.3 of this chapter, the country in which a migrant' qualification was obtained is an important predicting factor of literacy and numeracy proficiency, but also labour market outcomes. In some countries, this is actually more important than the actual country of birth. The empirical evidence suggests that the returns to foreign education are lower than those to education acquired in the country. In this section, we examine first the returns to education distinguishing between qualifications obtained abroad and domestic ones. Differences in the returns between foreign and domestic education may capture to some extent differences in the quality and content of the educational system. They may also reflect the employers' limited capacity to evaluate foreign credentials, in particular those from countries they no ties with, or limitations in the system of formal recognition of foreign credentials or also the limited interest on the migrant side to have his/her credentials recognised. Indeed, data from the 2008 ad hoc module of the European Labour Force Survey show that only 15% of migrants used the facilities for establishing what highest qualification equates to in the host-country system. This percentage is higher for those with higher education (24%) as often migrants go through this process in order to enrol in further education in the host country.

In eight out of the 13 countries with statistically significant results in Figure 8.28, the returns to education are higher for those who acquired their highest qualification in the host country. In Canada, Italy, Spain and Ireland the difference is quite substantial (for Canada, Ferrer and Riddell, 2008, find similar evidence). In these countries, one year of schooling increases the earnings of migrants with host country qualifications by 3 percentage points more than for migrants with foreign qualifications. In the United Kingdom, Germany and the Netherlands, the returns to foreign-qualifications are zero or statistically insignificant, whereas they are positive and statistically significant for migrants with host-country qualifications. These findings suggest that even after controlling for literacy proficiency which is expected to account for any language-related factors as well as cognitive skills, the returns to host-country qualifications are higher. This can be because of limited transferability of foreign educational credentials and discrimination. It can also be because of the limited information available to employers who use a host-country degree as a signal of quality and knowledge of the culture and norms of the country. Unfortunately it is not possible to distinguish between the two with the available data.

Figure 8.28. The returns to years of schooling, by place of birth and place of acquisition of highest qualification

Percent increase in wages



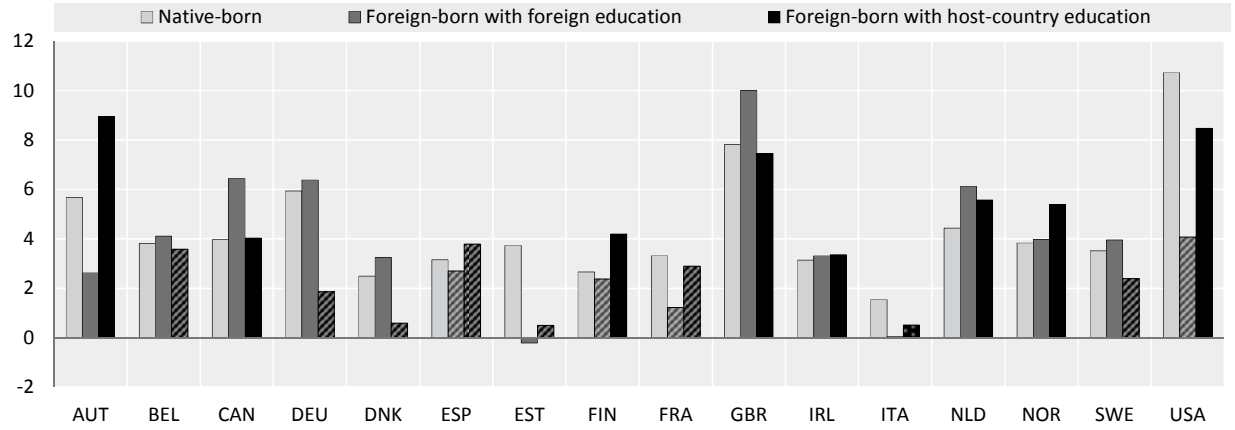
Note. The coefficients in the figure are estimated with log-linear models of wages with controls for literacy proficiency, gender, part-time work, experience and experience squared. Separate regressions have been estimated for natives, foreign-born from EU and foreign-born from non-EU countries. The coefficients represent the increase in wages in percentages, associated with an increase of one year of schooling. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

In Figure 8.29 we present the returns to literacy proficiency separately for migrants with host and those with foreign qualifications. The picture differs across countries. On the one hand, in Australia, Finland, Norway and the United States, the returns to literacy are greater for those with domestic qualifications. In contrast in Canada, the United Kingdom and Germany, the returns are higher among those with foreign qualifications.

Figure 8.29. The returns to literacy proficiency, by place of birth and place of acquisition of highest qualification

Percent increase in wages



Note. The coefficients in the figure are estimated with log-linear models of wages with controls for years of schooling, gender, part-time work, experience and experience squared. They represent the increase in wages in percentage, associated with an increase in literacy proficiency by half a level (25 points). The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

The returns to labour market experience acquired abroad and in the host country

Having examined the returns to education, we now turn to the returns to professional experience. Figure 8.25 presents the wage increase associated with an additional year of experience, separately for migrants and natives. In all countries except the United States and the United Kingdom, a year of professional experience pays less than an extra year of schooling, both for migrants and natives. The returns to professional experience for foreign-born workers range from about 2% in Finland, France and the Netherlands to close to a high of 6% in the Unites States and Ireland. On average, an additional year of work experience increases the wages of migrants by about 3% in countries in which the estimated returns are statistically significant (2.3% if all countries are taken into account).

In the vast majority of countries the returns to experience are higher for natives than for immigrants and the difference between the two is quite important in at least four countries: the Netherlands, Austria, France and Norway. Lower returns to overall experience for migrants in comparison with native workers can be due to low or zero returns to experience acquired prior to migration. The literature analysing how wages increase with professional experience for migrants shows that experience acquired abroad is not rewarded –or gets lower returns- relative to that acquired in the host country. One of the factors explaining these low or zero returns is a possible change in occupations and sectors with migration, which renders prior experience less valuable. It can also be linked to limited transferability of professional competences acquired in the home country to the host-country labour market.

Evidence from PIAAC (Table 8.7) confirms that immigrants get zero or low returns to their experience acquired abroad. In the majority of countries in Table 8.7, the returns to foreign experience are not significantly different from zero. The negative returns to

foreign experience estimated in some countries may reflect the lower wages of migrants who arrived at an older age. In contrast, the returns to domestic experience are positive and in the majority of countries statistically significant. An extra year of host-country experience for migrants is associated with 5% higher wages in the United States. For the majority of countries, the returns range between 2% and 3% for every additional year of experience.

Table 8.7. The returns to domestic experience and experience acquired abroad

	Domestic experience	Foreign experience
Austria	0.026530 ***	-0.016526 *
	(0.0077)	(0.0098)
Belgium	0.0215 *	-0.0073
	(0.012)	(0.0113)
Canada	0.035395 ***	-0.014908 ***
	(0.0035)	(0.004)
Denmark	0.030477 ***	0.009596
	(0.0074)	(0.0087)
Estonia	0.008053	-0.014929
	(0.0097)	(0.0166)
Finland	0.0134 **	0.0171
	(0.0069)	(0.0171)
France	0.018541 ***	0.011212
	(0.0059)	(0.0098)
Germany	0.0343 ***	0.0170
	(0.0092)	(0.0276)
Ireland	0.050096 ***	-0.000544
	(0.0112)	(0.011)
Italy	-0.0094	0.0003
	(0.0236)	(0.017)
Netherlands	0.025958	-0.031639 *
	(0.0168)	(0.0174)
Norway	0.0199 **	0.0052
	(0.0077)	(0.0117)
Spain	0.016807	-0.027886 **
	(0.0118)	(0.0136)
Sweden	0.022763 ***	-0.015403
	(0.0071)	(0.0139)
United Kingdom	0.023778 ***	0.001811
	(0.0085)	(0.0112)
United States	0.0505 ***	0.0264
	(0.0093)	(0.0434)

Note: The sample includes migrants aged 16-65. These are results from regressions with log wages as the dependent variable which include control for years of schooling, a gender dummy, a dummy for part-time work, a dummy for migrants who have been in the country for more than five years and the score in literacy proficiency. The coefficients represent the percent change in the wages of migrants associated with an additional year of experience acquired in the host country. For instance, the coefficient on domestic experience in Austria indicates that migrants earn 2.7% higher wages with every additional year of experience. Standard errors in brackets. *** p<1% ; ** p<5%; * p<10%.

Source: Survey of Adult Skills (PIAAC) 2012.

What is the remaining wage gap between migrants and natives?

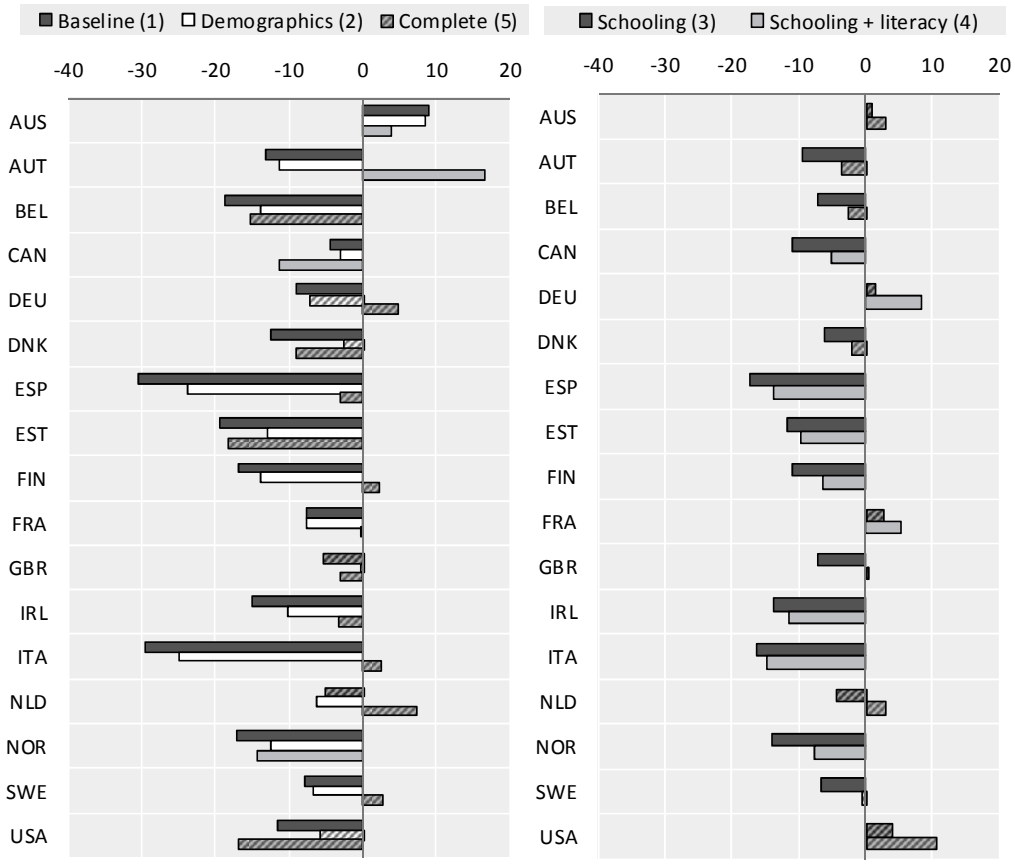
A relevant question for integration policy is whether there is a remaining wage gap between migrants and natives once all relevant variables and factors have been taken into account. This section attempts to answer this question. First, we examine to what extent

the wage gap between foreign-born and native-born persons is driven by differences in skills which are usually unobserved in the majority of analyses as they are not available in common datasets (right panel in Figure 8.30). Controlling for literacy proficiency renders the foreign-born coefficient no statistically different from zero in five countries (Austria, Denmark, the United Kingdom, Belgium and Sweden). In seven more countries, the wage gap between immigrants and natives is reduced significant once differences in literacy skills between natives and migrants have been taken into account. In Canada, literacy skills account for about half of the wage gap, while this is between 42% and 45% in Finland and Norway. The result for Canada is similar in magnitude to that found in Ferrer et al. (2006). In Ireland, Estonia and Spain, controlling for literacy proficiency reduces the wage gap between migrants and natives by 15 to 20%.

In the left panel of Figure 8.30, we estimate a "complete" wage model which contains controls for the country in which the highest qualification was acquired, a dummy variable for migrants who have been in the country for more than five years, an indicator of EU country of birth and a control for language, in addition to literacy, schooling and experience. The wage differentials between natives and migrants disappear in the majority of countries, once these factors have been accounted for. In Austria and Australia, the adjusted differences between migrants and natives turn positive once controls for literacy, country in which the qualification was acquired and language spoken at home are taken into account. The wage gap of 17% and 16% between migrants and natives in Spain and Italy respectively as estimated in the simple model which includes only controls for basic demographic variables is among the highest in the countries reported in Figure 8.30. However, this differential becomes non-statistically significant when all other factors have been taken into account, suggesting that the initial gap was mainly driven by the composition of migrants in terms of educational attainment and literacy skills as well as language proficiency and the country where their qualification was acquired. In contrast, a negative wage differential is estimated in Canada and Norway, of the order of 10% and 15% respectively, even after all migrant-related factors have been taken into account. This result may be driven by differences in their unobserved characteristics and skills, partial recognition of their qualifications or discrimination. Unfortunately it is not possible to take these factors into account given the available information in PIAAC or identify which ones are the responsible factors for this result.

When only tertiary-educated persons are considered, wage gaps between migrants and natives are greater than those presented in Figure 8.30 (results are available upon request). When literacy proficiency is accounted for, the remaining wage differential is either very small or becomes insignificant in the United Kingdom, Germany, Ireland and Sweden. In the other countries, controlling for literacy reduces significantly the wage gap between highly educated migrants and similar native. Differences in literacy proficiency account for 15% of the wage gap in France and up to 51% in Canada. In Austria, Denmark, the Netherlands and Norway, 30-35% of the wage gap is related to differences in literacy proficiency between migrants and natives with higher education.

Figure 8.30. The remaining wage differential between natives and migrants



Note: The sample includes persons aged 16 to 65. Every coefficient in the two figures is estimated in separate log-linear models of wages. The "baseline" regressions are simple correlations between wages and a dummy for foreign-born individuals. The "demographics" model includes controls for gender, a quadratic in age, a dummy variable for part-time work and an intercept. The "schooling" model also includes years of schooling and "schooling+ literacy" is augmented by the continuous variable on literacy proficiency. The "complete" model includes in addition to that, a dummy for language spoken being the language of the host country, a variable for foreign qualification, a variable for migrants who have been in the country for more than five years and a variable for EU origin. The reported coeffiecients represent the wage gap (in percent) between migrants and natives. For instance, for Australia, the coefficient of the baseline specification indicates that migrants earn on average 10% more than natives. The striped bars indicate coefficients which are not statistically significant (at 10% level).

Source: Survey of Adult Skills (PIAAC) 2012.

Table 8.8 presents more detailed results of the complete model which was estimated to provide the coefficient for the foreign-born variable in Figure 8.30. In all countries, having a foreign qualification is associated with lower wages on average. However, in about half of the countries included in the analysis, the coefficient of foreign qualification is not statistically significant. Overall, having a qualification acquired abroad is associated with a wage penalty which ranges between 7% in France and 25% in Italy. In most countries, after controlling for all relevant variables, there is little or no effect of speaking the host-country language (has learned the language as a child and still speaks it) on top of what has already been taken into account through the literacy score and years of schooling. Exceptions are Australia, Canada, the United Kingdom and Estonia, where speaking the host-country language is associated with a wage premium ranging from 5% in Canada to 16% in the United Kingdom. In Canada, where both the foreign

qualification variable and that on host-country language are statistically significant, the negative effect of having a foreign qualification amounts to four times the wage premium of speaking the host-country language.

This analysis on wages demonstrates that, similar to the analysis of overqualification, migrants who have been less exposed to the host-country language and labour market earn on average less than those who been in the country for longer, either as workers or as students and an important element in this is the ability to speak the host-country language.

Table 8.8. The determinants of wages

	Literacy	Years of schooling	Experience	Foreign-born	Duration of stay>5	Foreign qualification	Host-country language
Australia	0.0014 ***	0.0663 ***	0.0354 ***	0.0386 *			0.0341
	(0.0003)	(0.0038)	(0.0025)	(0.0199)			(0.0313)
Austria	0.0020 ***	0.0696 ***	0.0416 ***	0.1922	-0.1192	-0.1877 ***	-0.0001
	(0.0003)	(0.0031)	(0.0031)	(0.0832)	(0.0723)	(0.0547)	(0.0342)
Belgium	0.0014 ***	0.0572 ***	0.0283 ***	-0.1284	0.080705	0.0180	-0.0745 **
	(0.0003)	(0.0031)	(0.0024)	(0.0849)	(0.0778)	(0.0614)	(0.0375)
Canada	0.0016 ***	0.0689 ***	0.0393 ***	-0.0985 **	0.1454 ***	-0.1315	0.0273
	(0.0002)	(0.0031)	(0.002)	(0.041)	(0.0318)	(0.0251)	(0.0213)
Denmark	0.0010 ***	0.0594 ***	0.0366 ***	-0.0847	0.061925	-0.0510	-0.0919
	(0.0003)	(0.0027)	(0.0021)	(0.0588)	(0.0464)	(0.0497)	(0.0571)
Estonia	0.0012 ***	0.0659 ***	0.0201 ***	-0.1845	0.1432	-0.1250 *	0.1083 **
	(0.0003)	(0.004)	(0.0024)	(0.1941)	(0.1924)	(0.064)	(0.0536)
Finland	0.0010 ***	0.0556 ***	0.0232 ***	0.0410	-0.09623	0.0527	0.0849 *
	(0.0003)	(0.0022)	(0.002)	(0.1282)	(0.1165)	(0.0713)	(0.0471)
France	0.0011 ***	0.0509 ***	0.0308 ***	0.0173	0.0160	0.0220	-0.0469
	(0.0002)	(0.0024)	(0.0022)	(0.0857)	(0.0856)	(0.0423)	(0.0455)
Germany	0.0023 ***	0.0832 ***	0.0456 ***	0.0495	0.053617	0.0157	0.0709
	(0.0004)	(0.0049)	(0.003)	(0.1152)	(0.1171)	(0.0974)	(0.0765)
Ireland	0.0013 ***	0.0604 ***	0.0397 ***	-0.2086 ***	0.1646 ***	-0.0144	0.0189
	(0.0004)	(0.0045)	(0.0056)	(0.065)	(0.0562)	(0.0498)	(0.0527)
Italy	0.0005 *	0.0503 ***	0.0277 ***	-0.1074	0.115484	-0.1899 *	-0.0057
	(0.0004)	(0.0037)	(0.005)	(0.1425)	(0.107)	(0.0966)	(0.0608)
Netherlands	0.0018 ***	0.0684 ***	0.0515 ***	0.1090	-0.0271	-0.0851	0.0478
	(0.0004)	(0.0054)	(0.0031)	(0.2806)	(0.2778)	(0.0655)	(0.1508)
Norway	0.0015 ***	0.0511 ***	0.0320 ***	-0.1327 *	0.078405	-0.0002	-0.0004
	(0.0003)	(0.0036)	(0.0019)	(0.0736)	(0.074)	(0.0453)	(0.044)
Spain	0.0013 ***	0.0649 ***	0.0207 ***	-0.0464	0.057817	-0.2049 **	-0.1588
	(0.0003)	(0.0037)	(0.0042)	(0.1292)	(0.1027)	(0.0795)	(0.1235)
Sweden	0.0014 ***	0.0347 ***	0.0216 ***	0.0556	-0.03477	-0.0938 ***	-0.0238
	(0.0002)	(0.0026)	(0.0017)	(0.0489)	(0.0489)	(0.0306)	(0.0328)
United Kingdom	0.0028 ***	0.0696 ***	0.0388 ***	-0.0562	0.114742	0.0303	0.1364 ***
	(0.0003)	(0.0051)	(0.0032)	(0.0786)	(0.0681)	(0.0534)	(0.0503)
United States	0.0021 ***	0.0777 ***	0.0413 ***	-0.1632	0.165649	0.1727 *	-0.0517
	(0.0005)	(0.0072)	(0.0042)	(0.1163)	(0.1179)	(0.0848)	(0.0644)

Note: The sample includes persons aged 16 to 65. The depedent variable is log wages. The regressions also include experience squared, a gender dummy and a dummy for part-time work. The coefficients should be interpreted as the percent change in wages associated with an one unit change in the independent variable. For instance, the coefficient of years of schooling for Australia suggests that an additional year of schooling is associated with 6.6% higher wages. Standard errors in brackets. *** p<1% ; ** p<5%; * p<10%.

Source: Survey of Adult Skills (PIAAC) 2012.

8.6. Conclusion

This chapter has provided a preliminary analysis of the Adults Skills Survey data on the skills of migrants in selected OECD countries participating in the survey. It has analysed how these skills compare with those of native-born persons with similar

characteristics but has also examined possible differences across migrant groups and across countries. In addition, the chapter has examined the utilisation of migrants' skills in the labour market and the returns they receive both in terms of the kind of job they have and whether this corresponds to their qualifications (the probability of overqualification) and in terms of wages. Overall, the Adult Skills Survey has shown that educational attainment is an imperfect proxy for skills, and this is even truer in the case of migrants and especially those who have completed their education abroad. There is a lot of heterogeneity within the three levels of formal education (low, medium and high) in terms of literacy and numeracy skills and this is greater for migrants in comparison with native-born individuals.

Rising numbers of highly-educated across the world in combination with a great degree of heterogeneity within this group of university graduates suggests that immigrations policies that select people only on the basis of their educational attainment may not be successful in identifying and attracting the most skilled ones. Other factors may need to be taken into account, such as language proficiency or specific work-related skills which are tested prior to migration. Indeed, certain OECD countries have introduced additional elements of selection into their immigration policies. Some countries target graduates from top universities (e.g. the Netherlands with its Regeling Hoogopgeleiden scheme). Others, such as Canada and Germany, increasingly validate skills prior to arrival. Most OECD countries have also made it easier for international students to stay in the country upon graduation, on the assumption that this group of migrants possesses relevant skills, including a good proficiency in the host-country language and knowledge of the social norms of the country. Finally, in some countries employers are given a greater role than in the past and are called to select directly the skilled persons who seem suitable for the job.

The analysis in this chapter has demonstrated that differences in literacy proficiency between migrants and natives are smaller for migrants who have stayed longer in the country and those who have a host-country qualification. The analysis on language and foreign qualifications suggests that an important part of the differences in literacy proficiency between migrants and natives reflect language difficulties and differences in the quality of education across countries. Literacy proficiency is also greater for migrants who arrived as young children and completed their education in the host country. This result offers some support to policies that facilitate and encourage rapid family reunification in families with young children.

Mastery of the host-country language is indeed a key factor in achieving better labour market outcomes and getting full rewards for one's qualifications. This may suggest that selective immigration policies should place a greater focus on language assessment rather than select solely on the basis of education and experience acquired in the home country. This result also highlights the need for language courses in particular for migrants who arrive in the country as adults and those who have completed their education abroad. Combining such language training with some form of host-country short qualification or certification which would validate prior education could provide an advantage to those migrants, because employers tend to perceive host-country qualifications as a signal of better skills and language ability.

Education and professional experience acquired abroad are strongly discounted in the host-country labour market in comparison with those acquired domestically. The analysis on the probability of overqualification and wages suggests that in most countries, the country in which the highest qualification was obtained matters more than the actual

country of birth for immigrants. Evidence also suggests that migrants do get only limited returns to experience acquired outside the host-country's labour market. This points to the need to encourage recognition and certification of experience in addition to qualifications obtained abroad.

An additional element concerns the age at arrival in the host country. In addition to the early arrival as students, two pieces of evidence in this chapter suggest that an early arrival in the host country can promote their skills utilisation and improve their labour market outcomes. First, both overqualification and wage outcomes improve with time since migration. Second, persons who arrive at an older age and have spent some years working in their home country's labour market, get no value in the host-country labour market for their experience acquired abroad. This evidence could provide support for certain countries' immigration policies, such as Canada, which favour the immigration of young persons relative to more experienced workers.

The analysis in this chapter is only a first exploration of the Survey of Adult Skills relative to migrants and many relevant policy questions have not been addressed yet. First, a key question is whether migrants are indeed positively selected relative to their compatriots who have not migrated. This issue could possibly be investigated with the Survey of Adult Skills as some important countries of origin of recent migration to OECD (e.g. Poland, the Slovak Republic, Estonia and the Czech Republic) also participate in the survey.

A second area which has not been investigated in this chapter but it of great interest to policy makers is the access to training (both on the job and outside) and possible differences between migrants and natives. As already mentioned, following some training and most importantly getting a certification for such training can be valuable for migrants who have acquired their education abroad. The Survey of Adult Skills contains detailed information on training undertaken by participants and would allow for a detailed comparison between the two groups. It could also be used to explore the role of training in labour market outcomes and its role in closing the gap between foreign-born and native-born persons.

Finally, in recent years, there has been a lot of discussion about non-cognitive skills, soft skills that although they are not perfectly correlated with educational attainment, are important predictors of individuals' success in the labour market. Because of the complexity of measuring such skills, little is known about differences between migrants and natives in the use of such skills in the workplace. The Survey of Adult Skills contains a series of questions about the use at work of a range of generic skills, such as influencing others, cooperating with others, use task discretion, planning or organisation at work, among others that could be exploited to analyse possible differences in the type of jobs immigrants and natives perform. In addition to such skills, the Survey of Adults Skills offers the possibility to examine multilingualism and its rewards in the labour market.

Notes

1. The Survey of Adult Skills covers a total of 18 EU countries.

2. Footnote by Turkey. The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

3. Footnote by all the European Union Member States of the OECD and the European Union. The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus."

4. The term literacy and numeracy skill is used interchangeably with literacy and numeracy proficiency throughout the text.

5. The remaining 5% were either missing or failed the assessment and were directed to the reading components.

6. According to the OECD (2013a), the share of persons with foreign nationality was 1.6% in Japan 2011 (Register of foreigners at the Immigration bureau, Ministry of Justice) and 2.2% in Korea in 2011 (Ministry of Justice). The share of foreign-born was 1.8% in Poland in 2011 (Central Statistical Office) and 4.6% in the Slovak Republic in 2005 (Ministry of the Interior).

7. Foreign qualification is defined as a qualification that was acquired outside the country of current residence.

8. A variant of Figure 8.6 which breaks down foreign-born persons into those from EU and non-EU countries for selected OECD countries can be found in Figure 8.A1.3 in the annex.

9 A variant of Figure 8.7 which also shows the gap between EU-born migrants and native-born persons for selected OECD countries can be found in Figure 8.A1.4 in the annex.

10. In this chapter, regressions results are often presented in the form of figures for the sake of simplicity. In these figures, significance is indicated at the 10% level. Given the small number of observations of migrants in some of the analyses undertaken in this chapter, using the conventional 5% level would imply a number of statistically insignificant results and hence loss of valuable information. The detailed regression outputs are available upon request.

11. The reference category is that neither parent has attained upper secondary education. Category two is "at least one parent has attained secondary education and post-secondary, non-tertiary education" and category 3 is "at least one parent has attained tertiary education".

12. The results for numeracy (Figure 8.A1.5 in the annex) are similar to those for literacy and only education seems to be more highly correlated with numeracy test scores, both for migrants and natives.

13. In this section, mismatch refers to the situation where a person works in a job which required skills or educational credentials that are different from those that the person possesses.

14. This distinction is not possible in the Survey of Adult Skills because of the small number of observations for most of the countries covered by the data.

15. Linear probability models have been estimated throughout Section 8.4.

16. This variable is defined on the basis of the different languages one speaks or learned as a child, as well as the language commonly spoken at home. If none of these languages is the language spoken in the host country, then the dummy variable takes the value zero. If at least one of them is the host-country language, then the dummy takes the value one.

17. The results can be made available upon request.

18. It would be interesting to examine how the wages of immigrants compare with those of natives in shortage occupations, in countries where these are clearly defined. However, this is not possible because of the small samples which do not allow a fine disaggregation by occupation.

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Annex 8.A1

Further descriptives and analysis

Table 8.A1.1. Descriptives of migrants in the International Survey of Adult Skills

Percentages

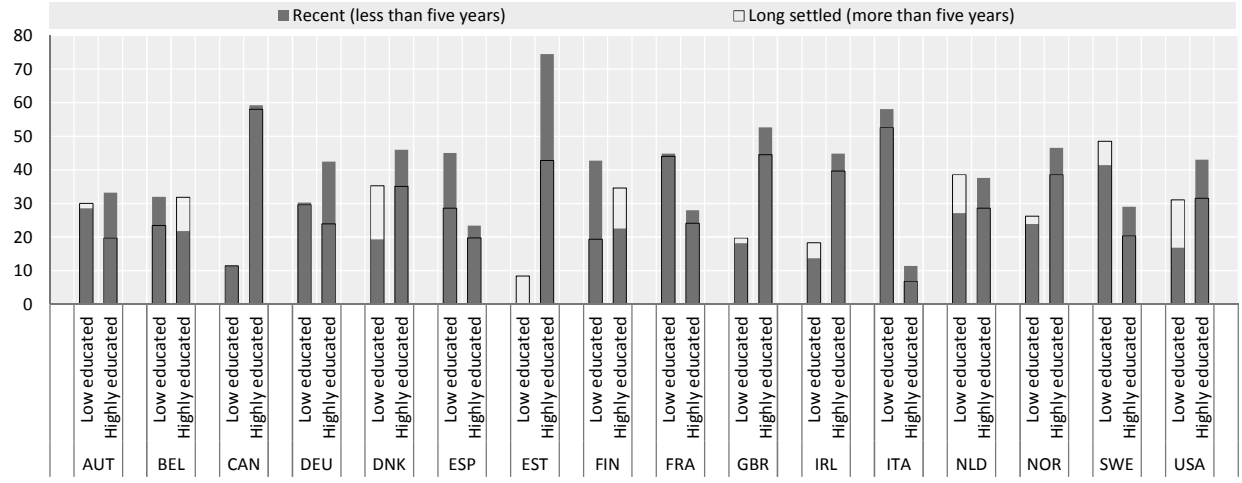
	Share of recent migrants	Share of immigrants who arrived before age 6	Share of immigrants who are native in the host-country language	Share of immigrants with foreign qualifications	Share of EU migrants
Australia	..	..	49.7	..	..
Austria	14.5	11.2	26.0	69.9	39.3
Belgium	16.2	18.0	43.3	64.3	46.5
Canada	19.9	13.7	32.0	55.3	21.6
Denmark	26.4	17.3	14.4	53.2	35.5
Estonia	2.3	30.4	87.0	40.5	5.5
Finland	21.7	17.7	36.3	53.0	29.3
France	9.0	20.3	42.1	51.4	24.2
Germany	8.1	13.9	..	57.3	..
Ireland	31.6	16.0	55.3	63.3	74.2
Iraly	14.8	17.2	21.4	68.2	40.2
Netherlands	9.9	19.9	26.8	56.7	15.3
Norway	32.3	10.4	8.3	61.7	46.0
Spain	6.8	7.6	62.0	77.4	24.5
Sweden	78.7	15.4	11.7	52.5	32.3
United Kingdom	30.1	15.5	41.0	56.5	32.0
United States	30.7	14.5	25.2	55.9	9.5

Note: The sample includes persons aged 16-65.

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.A1.1. Educational attainment of migrants by time since migration

Percentage among the recent or long-settled migrants

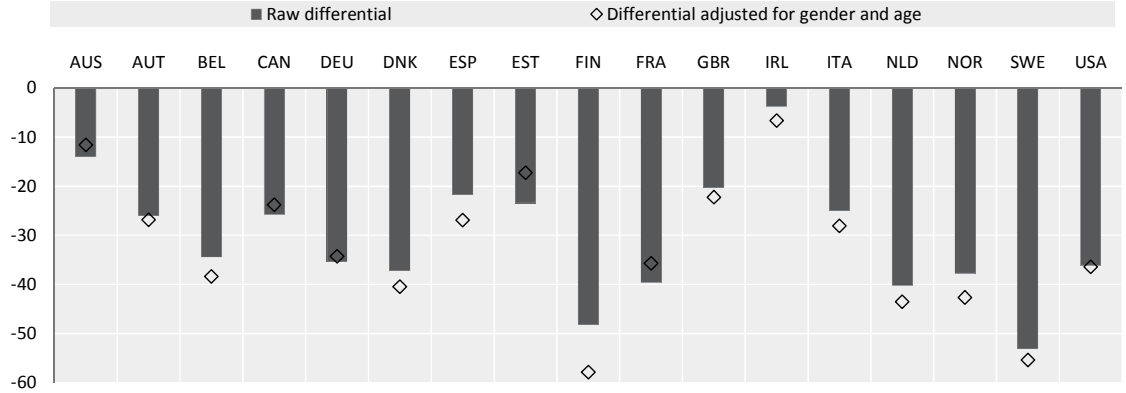


Note: The sample includes persons aged 16-65. Low educational attainment refers to less than upper secondary education and high educational attainment to tertiary education.

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.A1.2. Adjusted and unadjusted differences between natives and migrants in literacy proficiency

Score points

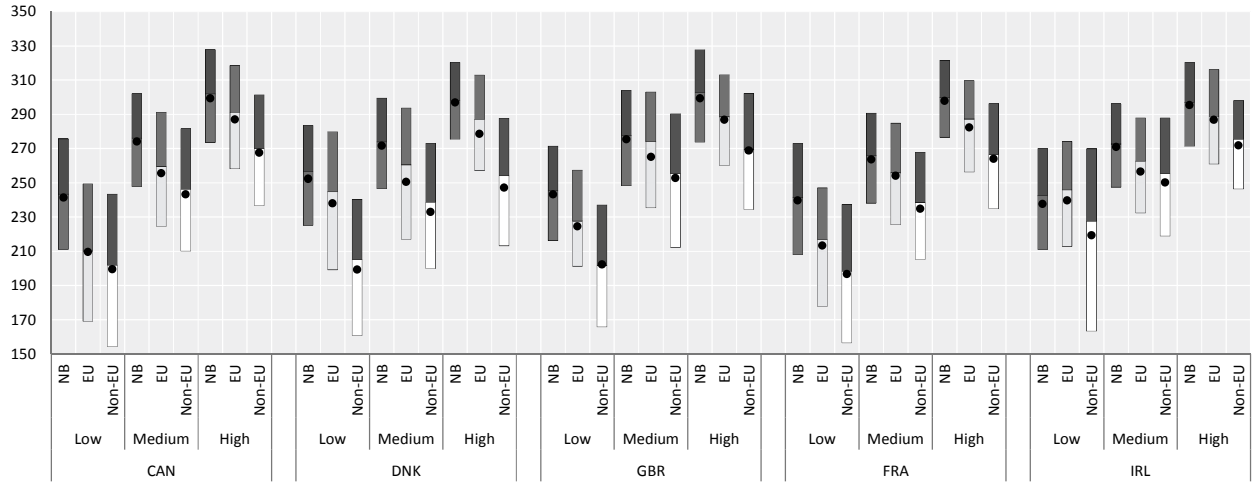


Note: The sample includes persons aged 16-65. The bars represent the raw difference in literacy proficiency between migrants and natives. The diamonds are the coefficients of a foreign-born dummy variable estimated in a model of literacy proficiency which controls for age and gender.

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.A1.3. Distribution of literacy scores, by education and EU/non-EU status

Score points

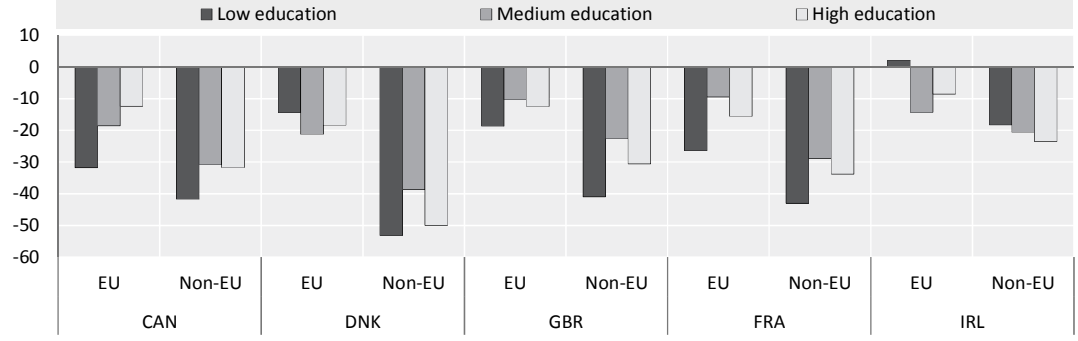


Note: The sample includes persons aged 16 to 65. The lower end of the bar represents the 25th percentile, while the upper one the 75% percentile. The black dot in the middle is the mean.

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.A1.4. Gap in literacy performance between migrants born in the EU or outside the EU and natives, by education level

Score point difference

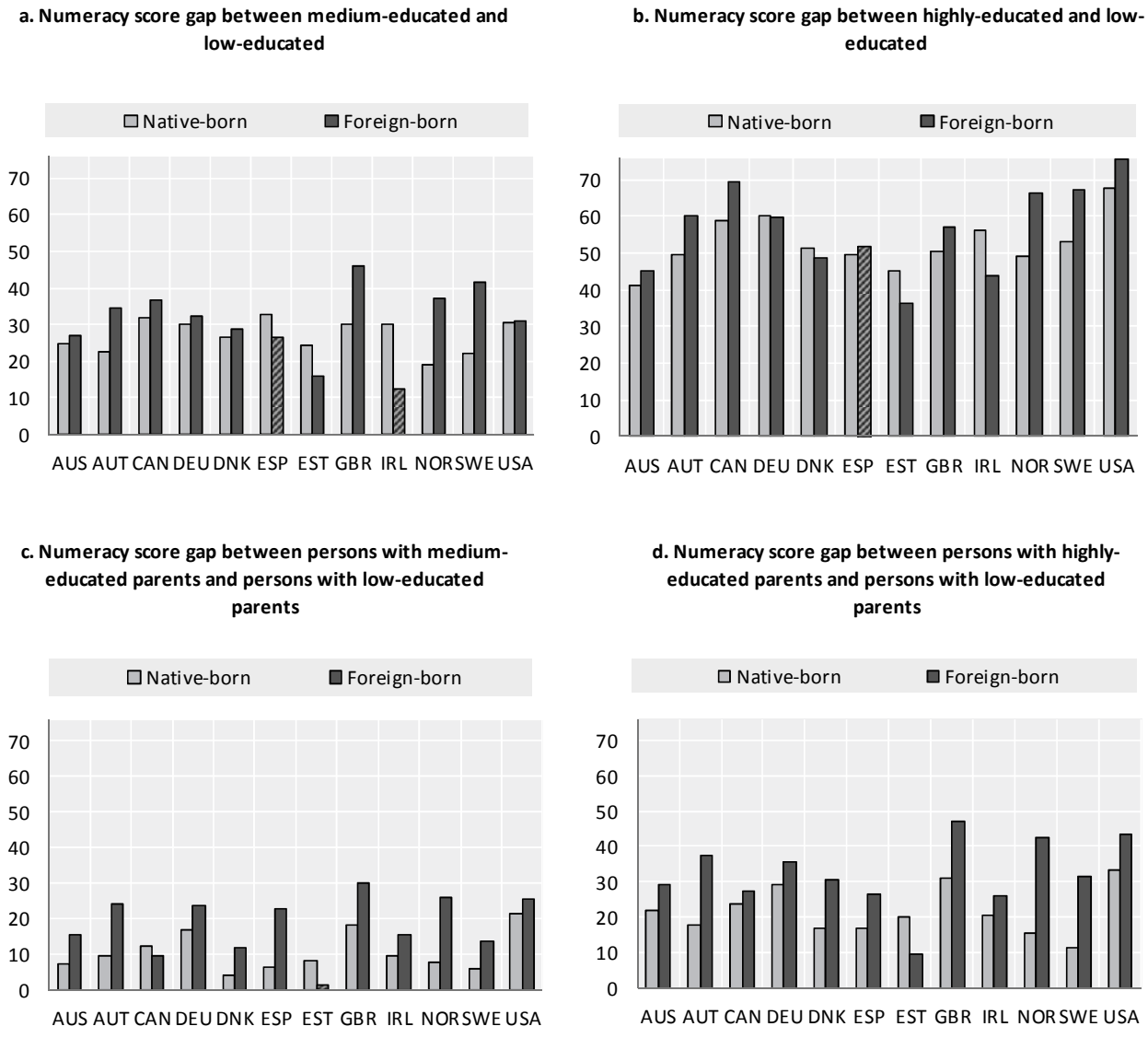


Note: The sample includes persons aged 16 to 65. Low education corresponds to less than upper secondary, medium education to upper secondary and high education to tertiary education.

Source: Survey of Adult Skills (PIAAC) 2012.

Figure 8.A1.5. Gap in numeracy performance between migrants and natives, by education level and parental education level

Literacy score points



Source: Survey of Adult Skills (PIAAC) 2012.

Part III. Labour shortages and migration

Chapter 9

Projected labour market imbalances in Europe: Policy challenges in meeting the Europe 2020 employment targets

Cedefop's Skills Analysis Team
under the supervision of Pascaline Descy, Head of Area, Research and Policy Analysis[1]

This chapter investigates the extent to which the economies of EU member states are likely to encounter aggregate skill imbalances by the year 2020, and assesses the necessity of appropriate policies (e.g. activation, migration) for addressing such imbalances. The baseline projections of Cedefop's European skills forecasting model are used to examine the nature of anticipated discrepancies between the supply and demand for labour in EU member states. The chapter subsequently examines the implications for "sustainable" activity rates based on the counterfactual hypothesis that all EU countries will meet their headline EU 2020 employment targets. The results highlight that meeting the respective EU2020 employment targets is dependent on considerable activation efforts by several EU member states, which will have to outweigh existing policies. To meet employment targets with shrinking populations at natural rates of unemployment, European policy makers will have to rely on a menu of policy choices to increase activity rates by about 4.3 percentage points on average in the EU economy. This may entail the activation of a significant share of the currently inactive EU population, or a reliance on migration and other socio-demographic policies to ensure that the future supply of labour will be sufficient to meet skill needs.

9.1. Introduction

After five years of anaemic economic recovery, following the financial crisis that shocked the global economy in 2008, the European Union is faced with historically high numbers of unemployed workers, declining employment rates and rising levels of poverty and social exclusion (European Commission, 2014). In the period between 2008 and 2012, the EU28 employment rate for people of working age (20-64 age group) dropped by 1.8 percentage points (from 70.3% in 2008 to 68.5% in 2012) and total employment (15+) fell by 5.4 million jobs, wiping out to a considerable extent the gains that were made in the first half of the decade. This rising tide of unemployment predominantly affected younger workers and individuals possessing a lower level of skills. The aftermath of the crisis saw widening imbalances in the demand and supply for people with different levels of educational attainment, leading to concerns about rising skill mismatches in European economies (European Commission, 2012a). Masked behind this overall negative outlook are marked divergences between the individual member states, with southern countries (e.g. Greece, Spain, Portugal, Cyprus[2,3]) suffering greatly as a result of pronounced macroeconomic imbalances in the pre-crisis era.

Against this backdrop of weakening labour market performance and social conditions, the attainment of the Europe 2020 headline employment target of 75% (for those aged 20-64) has become more difficult. For this reason, the European Commission recently recommended a series of policy measures to EU member states for returning back to positive employment growth rates, the so-called Employment Package (European Commission, 2012b). Nevertheless, the uncertain economic environment poses great challenges to both European and national policy makers who, faced with additional structural changes in their economies including adverse demographic trends, subdued productivity growth, increased global competition and weak aggregate demand, are confronted with the difficult task of ensuring that Europe does not get entangled into a jobless recovery.

The aim of this chapter is to investigate the extent to which the European economy, and those of member states, is likely to encounter aggregate imbalances and shortages of skills in the run-up to 2020. To do so the baseline projections of the Cedefop pan-European skill forecasting model are utilised to examine the nature of potential discrepancies between the supply and demand for labour of different skill levels in EU member states. After outlining the projections of a baseline scenario that relies on a set of plausible assumptions regarding Europe's anticipated employment growth, the chapter examines different counterfactual hypotheses based on the assumption that all European countries will meet their pre-specified EU2020 employment targets. The results illustrate that about 16 million new jobs would have to be created by 2020 in the European Union so that the 75% headline target is reached. To meet employment targets with shrinking populations, European policy makers would have to rely on a menu of choices to increase activity rates by about 4.3 percentage points to sustain such high employment rates at non-accelerating inflation rates of unemployment. These choices may include the activation of a significant share of the inactive European population of working age, or to rely on migration and demographic policies that will ensure that the future supply of labour in Europe will be sufficient to meet higher skill needs.

Section 9.2 of the chapter discusses the current state of play regarding the gaps that national governments are facing in meeting the Europe 2020 employment target. Section 9.3 assesses the extent to which European and national policy makers will have to invest in activation and/or migration policies should they wish to attain the Europe 2020

employment goal under full employment labour market conditions. Section 9.4 engages in hypothetical simulations of anticipated labour market imbalances in European countries by the year 2020, identifying the extent to which different EU member states will be faced with activation needs due to a shrinking active workforce. Finally, Section 9.5 concludes.

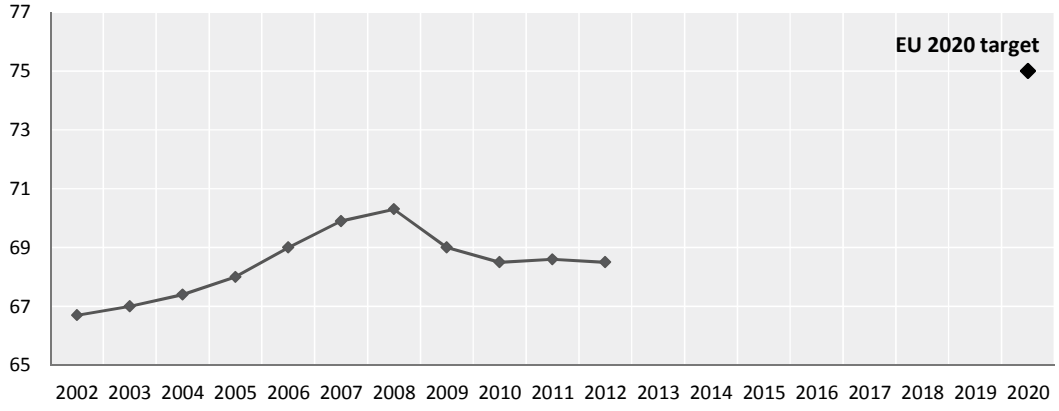
9.2. Employment rate gaps in EU member states

The attainment of an employment rate of 75% (of those of working age) constitutes one of the five headline targets of the Europe 2020 growth plan, an overarching strategy agreed for the whole of the European Union in 2010. This EU level target is translated into different national pre-specified targets for the employment rate, the latter taking into account particular national specificities and circumstances, ranging from a low of 59% for Croatia up to 80% for Denmark, Netherlands and Sweden.

In the years prior to the global financial crisis of 2008, major progress was made at both the EU and national level in terms of raising the proportion of working-age adults who were in employment. Nevertheless, a significant part of this progress has been lost as a result of the marked decline in employment experienced in most EU member states. As shown in Figure 9.1, the decline in the EU27 headline target between 2008 and 2012 implies that Europe needs to recover about 6.5 percentage points in its employment rate in the space of seven years if it is to reach the EU2020 target. This constitutes a challenging task considering that the EU employment rate rose by 3.7 percentage points in the pre-crisis period (2000-08), under relatively favourable economic and credit market conditions. Furthermore, the wedge between current and national employment rate targets increased in ten member states, decreased in 15 and remained unchanged in two (European Commission, 2014). In countries such as Greece, Spain, Bulgaria and Hungary, experiencing employment rate gaps of between 13-15%, a considerable amount of jobs need be created if they are to move closer to meeting their respective national employment rate targets by the end of the decade. By contrast, countries such as Germany, Sweden, Malta, Austria, the Czech Republic, the United Kingdom and the Baltic states are already close to attaining their individual targets.

Figure 9.1. Employment rate and EU2020 target, EU27

Percentages



Source: Eurostat.

9.3. Meeting the EU2020 employment target

The evolution of future labour market outcomes in market economies is fundamentally unknown and any attempt to predict its path is characterised by a considerable degree of uncertainty. Forces related to globalisation, technological progress, demographic changes (including migration flows) and changes in work organisation (including the substitution of non-routine tasks by automation) will shape the future landscape of employment. New industries and jobs related to the gradual shift to low carbon sustainable economies and different socioeconomic realities are likely to emerge and other established occupations and sectors will be replaced or rendered obsolete (Cedefop, 2013a). Even if the numbers of available active workers, determined by demographic and socioeconomic factors, were to be perfectly compatible with the available numbers of job openings, it is well known that a considerable degree of labour market mismatch and other qualitative skill mismatches in the economy will still prevail (Sattinger, 2013; European Commission, 2012a).

Nevertheless, there is a high likelihood that some of the underlying structural trends affecting the European labour markets in previous years will persist in the future, including the shift towards a service-oriented economy, ageing workforces and the process of educational upgrading (Cedefop, 2013b). It has been well documented that due to the gradual decline in the European population in future decades, a shrinking working-age population is likely to exert considerable strain on the age dependency ratio and on economic performance, including a slower, maybe even negative, employment growth over the next years in some countries. As discussed by Peschner and Fotakis (2013), the demographic dividend that Europe enjoyed in the last 40 years has been exhausted and Europe has entered onto a path of higher demographic dependency from 2012 onwards.

The baseline scenario of the Cedefop model

The Cedefop pan-European skill supply and skill demand forecasts are developed using a multi-modular macroeconomic model that produces regular and comparable projections of employment and of the active population for 33 countries (EU28 + Norway, Switzerland, Iceland, Turkey and the former Yugoslav Republic of Macedonia) on a bi-annual basis using harmonised data.[4] The model is based on a long time-series of macro-economic data spanning back to the 1970s to produce country-specific estimates of labour demand and labour supply. Assumptions regarding GDP and productivity growth rates, investment and other macroeconomic aggregates for the European economies are made in accordance with those of the European Commission's Directorate General for Economic and Financial Affairs (DG ECFIN).[5]

Historical and anticipated patterns of labour demand are approximated by the time trend of employment, which is disaggregated by 41 economic sectors (compatible with NACE rev. 2) (Cedefop, 2012). Within two separate modules, occupational and education qualification distributions within sectors are then exploited to break down the industrial level of employment into predictions of labour demand by 27 occupational groups (compatible with the ISCO 08 classification) and three broad levels of educational attainment (low, medium and high according to the ISCED classification). Replacement demand by occupation and qualification level, namely the number of job openings that will arise at the end of the decade due to the need to replace the workforce that will retire or leave the labour market, is an integral component of the model and is generated using a pseudo-cohort methodology. Together, the level of expansion and replacement demand

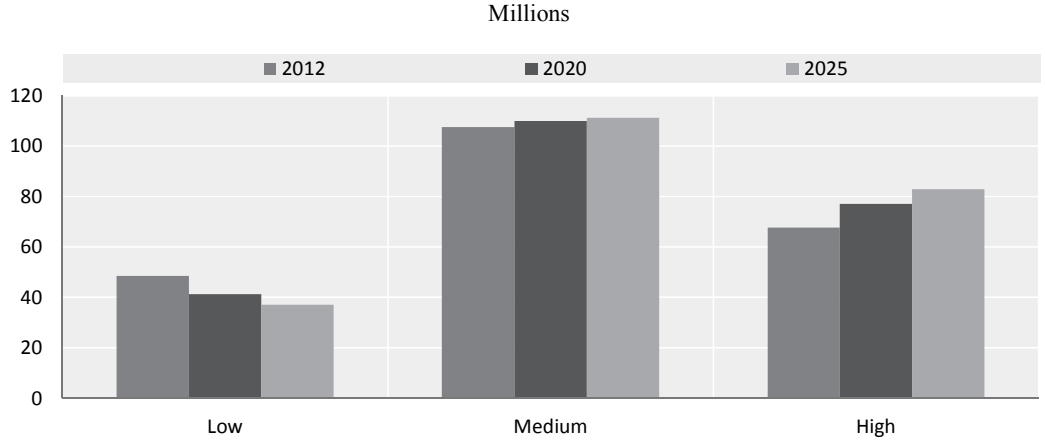
provides an estimate of the total number of job openings by skill level (as approximated by occupational groups and education qualifications).

The model also provides medium-term projections of overall labour and skill supply broken down by five-year age bands, gender and 3 educational qualification levels, derived on the basis of a historical analysis of demographic and labour supply trends in European countries. The population projections are compatible with the respective Eurostat EUROPOP2010 projections, whilst the assumed activity rates of different socioeconomic groups determining the population of working age are also based on pre-existing trends and reasonable assumptions of growth rates based on existing national policies. Moreover, an analysis of EU-LFS micro data is used to predict (using logit modelling) the probabilities of the labour force having different levels of educational attainment.

Together these country-specific estimates provide projections of trends that are anticipated to prevail in the next decade. A dedicated network of national experts (the so-called *Skillsnet*) scrutinises the national findings and highlights potential anomalies in the projected trends. The latest forecast results extend up to the year 2025 and are available online via Cedefop's web portal.

Figure 9.2 illustrates the anticipated skill composition of employment of the EU28 economy between 2012 and 2025, under a baseline set of assumptions (see Box 9.1). The model projects that the share of jobs employing higher-educated labour is likely to increase in the next decade, while the share of demand for lower-skilled workers will continue to decrease. On the basis of the model it is also expected that, overall, Europe will be characterised by sluggish employment growth, with about 2.8 million new jobs created in the space of the next seven years. This corresponds to an increase of about 1.3% in employment, enough to increase the number of people of working age (20-64) in the European Union that are employed from about 209 million workers in 2012 to approximately 212 million by 2020.[6]

Figure 9.2. Projected employment trends by level of educational attainment, EU28, 2012-25



Note: Baseline scenario. A low education level corresponds to ISCED 0-2, medium to ISCED 3-4 and high to ISCED 5-6.

Source: Cedefop country workbooks (see Annex 9.A1).

Box 9.1. Baseline assumptions of the Cedefop forecast model

The baseline scenario assumes a modest economic recovery while in the short-term trends are in line with the macroeconomic forecasts of the European Commission's Directorate General for Economic and Financial Affairs (DG ECFIN). The baseline scenario assumes that there will be a slow increase in overall economic confidence and a rise of investment, consumer spending and exports. Inflation stays in the target range and interest rates remain low. Higher tax revenues help governments to reduce debt levels. In such an economic environment an annual average GDP growth rate of 2.0% will be the norm in the time period 2013-20, while GDP growth will be 1.8% in the period 2020-25. The overall response of the labour market is positive reaching pre-crisis levels of employment (i.e. those experienced in 2008) by the year 2023. The labour supply trends (economic active population) will reflect the Eurostat EUROPOP2010 projections. Economic activity rates reflect all currently known national policies. All assumptions and results are validated by country experts to ensure their plausibility at the national level.

Table 9.1 displays the key labour market characteristics of the current baseline scenario. It is apparent that unless the current slow rate of employment growth is accelerated via the adoption of appropriate job friendly policy initiatives, the EU employment rate will only exceed the value it had before the 2008 economic crisis after the year 2020. Furthermore, Europe's employment rate will be considerably below the Europe 2020 headline target even in the year 2025.

Table 9.1. Projected labour market indicators of the working-age population (20-64) in the EU28, 2012-25

Percentages

	2012	2020	2025
Activity rate	76.0	77.6	78.4
Employment rate	68.5	69.6	71.2
Unemployment rate	10.2	10.3	9.1
Inactivity rate	24.0	22.4	21.6

Note: Baseline scenario.

Source: Cedefop country workbooks (see Annex 9.A1).

Meeting the Europe 2020 target without activation – a "naïve" scenario

Taking into account the adverse demographic trends as implied by the Eurostat Europop2010 projections, the European Commission (2014) infers that the EU27 labour market will have to create about 16 million jobs between 2012 and 2020 in order to meet the 75% headline target. This corresponds to an annual average growth rate of employment equal to 0.90%, with nearly 3% employment growth needed per year in countries such as Greece and Spain.[7]

In order to achieve the aforementioned scenario, taking into account the upper ceiling imposed by the shrinking working-age population, policy makers would need to take measures to expand the European labour force. The inescapable need to expand the active workforce becomes evident if one examines the consequences for the EU economy if it is to accomplish a 75% employment rate under its current activity rate (i.e. 76% in 2013) or, in fact, its anticipated activity rate in 2020 (77.6% as inferred by the baseline scenario of Cedefop's model). As shown by equation (1) below, which applies the tight link that exists by definition between the activity, employment and unemployment rates within any economy, meeting the 75% employment target without a corresponding increase in

Europe's activity rate would result in very low unemployment rates. These rates would range between 1.3% and 3.3%, depending on whether the current or expected baseline activity rate is assumed:

$$u_{2020} = 1 - \frac{E_{2020}}{LF_{2020}} = 1 - \frac{e_{2020} * POP_{2020}}{a_{2020} * POP_{2020}} = 1 - \frac{e_{2020}}{a_{2020}} = 1 - \frac{75}{77.6} = 3.3\% \qquad (1)$$

where u = unemployment rate, E = employment, LF = labour force, Pop = working-age population (20-64), e = employment rate and a = activity rate. Nevertheless, such low unemployment rates are likely to be unsustainable or infeasible. A certain level of frictional unemployment and labour market mismatches will always exist in the labour market, while the economy will be confronted with wage and inflationary pressures as it reaches its activity limits.

From equation (1) it is thus evident that a necessary (but not sufficient) condition for the European economy to attain its EU2020 employment headline target, in light of relentless demographic pressures, is to expand the continent's active workforce. Even under "normal" (baseline) assumptions, which take into account existing national practices and policies that have been adopted to raise current activity rates, it is apparent that the shrinking pie of available active workers will act as a constraint on the ability of the European economy to sustain a 75% employment rate. Alternative policies to expand the active workforce are therefore needed, which may include the encouragement of labour market participation among Europe's existing inactive population of working age (in particular younger people, women, older workers and migrants), investment in further education and training, immigration or other (longer-term) policies to stem the demographic decline.

Meeting the Europe 2020 target: Simulating sustainable scenarios

Any increase in a country's employment rate is unlikely to be generated in a vacuum. As expected by economic theory, rising employment is likely to be an outcome of higher GDP, investment and productivity growth. This will, in turn, have different implications for the wage rate depending on the extent of labour market flexibility and the nature of collective wage bargaining, as well as the assumed skill mix of the employed population. Changes in the wage rate will subsequently affect reservation wages and the observed activity rates of different subgroups of the population.

Modelling the above processes requires a full general equilibrium framework that allows for the incorporation of different behavioural assumptions regarding the interaction between key economic variables and the examination of the response of the endogenous variables of the model to alternative policy or economic shocks. While such an exercise is beyond the scope of this chapter, different possible scenarios are examined below to identify "*sustainable activity rates*" for the European economy. The latter are defined as those activity rates that prevail under the assumption that the EU2020 employment rate target of 75% is met whilst respecting the fact that the European unemployment rate cannot fall below historically low levels (e.g. as in the year 2008) or levels associated with non-accelerating inflation rates.[8]

Table 9.2 outlines the corresponding activity rates that are compatible with a 75% European employment rate and alternative assumptions made for unemployment in the EU27 economic area, in accordance with equation (1). It is clear that if Europe wishes to return back to the very low levels of unemployment that preceded the 2008 recession by

2020, namely a level of about 6.6% (Scenario 2 in bold), by concurrently raising its employment rate to 75%, an increase of about 4.3% in the activity rate will be necessary (i.e. the difference between the current value of 76.0% and the required level of 80.3%). What this implies is that even if the European economy manages to create jobs for the entire pool of individuals that became unemployed between 2008 and 2012 (about 8.2 million workers), there will still be a need to bring an additional 12% of the anticipated inactive population of working age (about 8.3 million workers) into the labour force, to accommodate the 16 million jobs created as a result of meeting the 75% employment rate target.

Furthermore, it is apparent from Table 9.2 that failure to reduce the unemployment rate below levels that were historically compatible with subdued inflationary pressures, implies a greater pressure to expand the activity pool. Considering the much lower activity rates of low- and medium-educated workers relative to those with high skills, policy makers will need to activate a sizeable 30-40% of the inactive population of lower-skilled workers if they wish to accomplish a 75% employment rate whilst tolerating an unemployment rate in excess of 10%.[9] But with activation policies to increase the labour force attachment of lower-skilled inactive individuals posing a relatively high fiscal cost to national budgets, policy makers in the European economy may have to resort to alternative measures to expand their active workforces, including migration policies.

Table 9.2. Simulated activity rates and need for activation under the assumption that the Europe 2020 75% employment rate target is met, EU27, 2020

Percentages

Scenario (1)	Unemployment rate (2)	Activity rate (3)	Additional need for activation (total pool of inactive) (4)	Additional need for activation (pool of low and medium-educated inactive) (5)
1	5.0	78.9	6.0	7.0
2	**6.6**	**80.3**	**12.0**	**14.0**
3	8.0	81.5	18.0	21.0
4	10.0	83.3	26.0	30.0
5	12.0	85.2	34.0	40.0

Note: The additional need for activation in column 4 refers to the extra share of workers required to be activated from the total projected inactive population in 2020 (Cedefop baseline scenario), to be consistent with the implied activity rate in column 3. Column 5 indicates the share of low- and medium-skilled inactive workers that need to be activated by 2020, corresponding to the respective activity rate in column 3.

Source: Cedefop's own calculations based on application of Equation (1).

9.4. Labour imbalances and the need for activation in EU member states

Considering the current economic conditions and high levels of unemployment, discussing policies necessary to achieve the EU2020 employment rate target may appear in some countries to be an abstraction of reality. But the aggregate EU activity and employment rates mask significant differences between member states and implicitly assume perfect mobility of workers across national borders. In fact, some EU countries are already quite close to achieving their employment goals and will most likely reach their national employment target by 2020 (if not earlier). In these economies the ceiling imposed by their currently high active workforces is already binding.

The implications of achieving the EU2020 national employment rate targets and the potential impact on the respective labour markets of EU member states are depicted in Table 9.3 below. Following a similar line of reasoning as for the total EU economy, "sustainable activity rates" have been derived (applying equation 1). This is done under the hypothetical scenario that all countries meet their respective national employment targets at the same time that their unemployment rates return by 2020 to the lowest level attained prior to the economic crisis (i.e. during the period 2004-08).

As is evident in Table 9.3 and Figure 9.3, the feasibility of reaching the national employment rate targets by the year 2020 varies significantly across different countries. Based on current Eurostat data, only Malta has already met its pre-specified target by 2012. A small difference of less than 2 percentage points exists between the current employment rate and the 2020 national target in five countries (Austria, Germany, Luxembourg, Sweden and the United Kingdom), while in four member states there is a very large discrepancy of more than 10 percentage points (Bulgaria, Spain, Greece and Hungary).

Figure 9.3 also reveals that only nine EU member states [Estonia, Ireland, Croatia, Cyprus (see notes 2 and 3), Latvia, Lithuania, Malta, Sweden and the United Kingdom] have the capacity to reach their national employment targets by bringing their unemployment rates back to pre-crisis levels until 2020, without having to expand their active workforces further than present levels. It needs to be pointed out, though, that only two of these countries (Estonia, Sweden) have set national targets that exceed the EU headline target. For the other countries in this group the pressure to expand their available labour forces will surface if their national employment rate is set above the EU's 75% benchmark. Labour supply constraints are, by contrast, already binding for all remaining member states, as it is apparent that even if they fully exploit their reserves of non-frictional unemployed labour, they will still need to increase their active workforces further to attain their national employment targets. Such activation needs range from between 1-3% for a group of countries that are already quite close to meeting their EU2020 national employment targets (Germany, Austria, Luxembourg, Netherlands, Czech Republic, Denmark, Finland), to about 3-6% for those closer to the average EU situation (e.g. France, Italy, Poland, Slovenia, Slovakia, Romani, Belgium). For Portugal, Greece and Spain the activation needs are relatively restrained due to the significantly large reserves of unemployed labour available. Hungary and Bulgaria are instead confronted with a twin challenge of engaging in substantial job creation in the face of significant labour supply bottlenecks.

Under the baseline scenario of Cedefop's forecasting model, EU countries will continue to increase their activity rates until the end of the decade and to implement a set of appropriate national policies towards achieving this goal. Furthermore, as discussed above, many EU economies will have to expand their activity rates further if they wish to meet their respective EU2020 employment target in a sustainable manner. Figure 9.4 therefore breaks down the total change needed for each EU country to attain its "sustainable activity rate" (i.e. $a^* - a$) during the period 2012-20 into two components, namely i) the change that is projected by the baseline scenario (dark grey bars) and ii) the remaining change that is required so that each country can have exactly its "sustainable activity rate" by the year 2020 (light grey bars).

Table 9.3. Current and "sustainable" activity rates compatible with EU2020 national employment targets, EU member states, 2012 and 2020

Percentages

	2012			2020		
	e	u	a	e*	u*	a*
EU28	68.4	10.2	76.1	75	6.7	80.4
EU27	68.5	10.1	76.2	75	6.7	80.4
Belgium	67.2	7.4	72.5	73.2	6.8	78.5
Bulgaria	63	12	71.6	76	5.4	80.3
Czech Republic	71.5	6.8	76.7	75	4.3	78.4
Denmark	75.4	7	81.1	80	3	82.5
Germany	76.7	5.5	81.1	77	7.5	83.2
Estonia	72.1	10.1	80.1	76	4.5	79.6
Ireland	63.7	14.4	74.4	69	4.1	71.9
Greece	55.3	24.1	72.8	70	7.6	75.8
Spain	59.3	24.5	78.6	74	7.8	80.3
France	69.3	9.5	76.6	75	7.1	80.7
Croatia	55.4	15.3	65.4	59	8	64.1
Italy	61	10.4	68	67	5.8	71.1
Cyprus[1,2]	70.2	11.8	79.6	75	3.7	77.9
Latvia	68.1	14.9	80	73	5.8	77.5
Lithuania	68.5	13.5	79.1	72.8	4.3	76.1
Luxembourg	71.4	5	75.2	73	3.8	75.9
Hungary	62.1	10.8	69.6	75	5.7	79.5
Malta	63.1	5.5	66.8	62.9	4.9	66.1
Netherlands	77.2	4.7	81.1	80	2.4	82
Austria	75.6	4.1	78.8	77	3.5	79.8
Poland	64.7	10	71.9	71	7	76.3
Portugal	66.5	15.9	79	75	6.4	80.1
Romania	63.8	7	68.6	70	5.6	74.2
Slovenia	68.3	8.9	74.9	75	4.3	78.4
Slovak Republic	65.1	13.6	75.3	72	9.2	79.3
Finland	74	7	79.5	78	5.6	82.6
Sweden	79.4	7.1	85.5	80	5.1	84.3
United Kingdom[3]	74.2	6.9	79.7	75	4	78.1

Note:

e* = national EU2020 target on employment rate of population of working age (20-64 years).

u* = simulated unemployment rate defined as the lowest rate in the pre-crisis period (2004-08).

a*= sustainable activity rate compatible with e* and u* (after application of equation 1).

1. Note by Turkey: The information in this chapter with reference to « Cyprus » relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

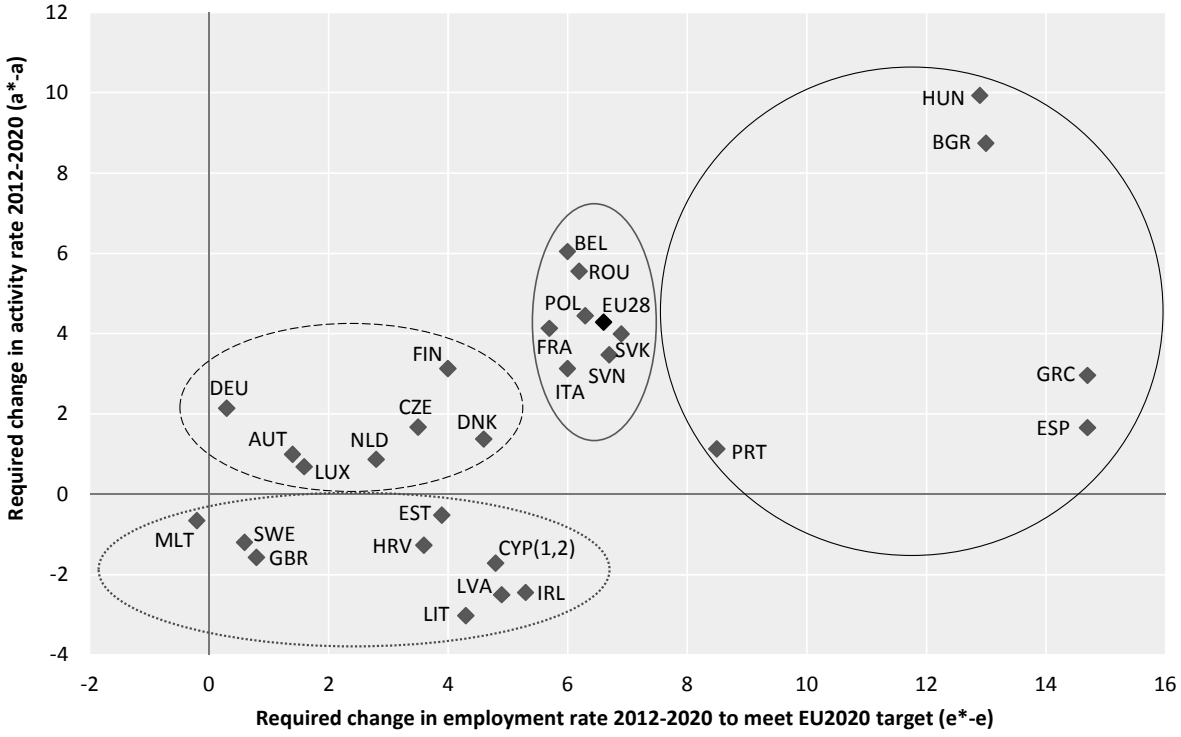
2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

3. The EU2020 employment target for the United Kingdom is not officially set. For the purpose of this exercise the EU headline employment target is assumed.

Source: 2012 data based on Eurostat; 2020 data based on own calculations.

A positive difference between the baseline and the EU2020 target scenario indicates that for some countries (e.g. Hungary, Belgium, Bulgaria, Italy, Slovenia, Romania) there is likely to be an anticipated shortfall in current efforts to increase activity rates. Therefore there is an immediate need for further activation efforts to take place over currently applied policies, aimed at expanding the activity rate to a^* and preventing potential bottlenecks from materialising. In contrast, there are some member states (marked with *) where the expected growth in activity rates under the baseline scenario is already enough to realise their "sustainable activity rate".[10]

Figure 9.3. Required changes in activity and employment rates in EU member states to meet the EU2020 national employment targets, 2012-20

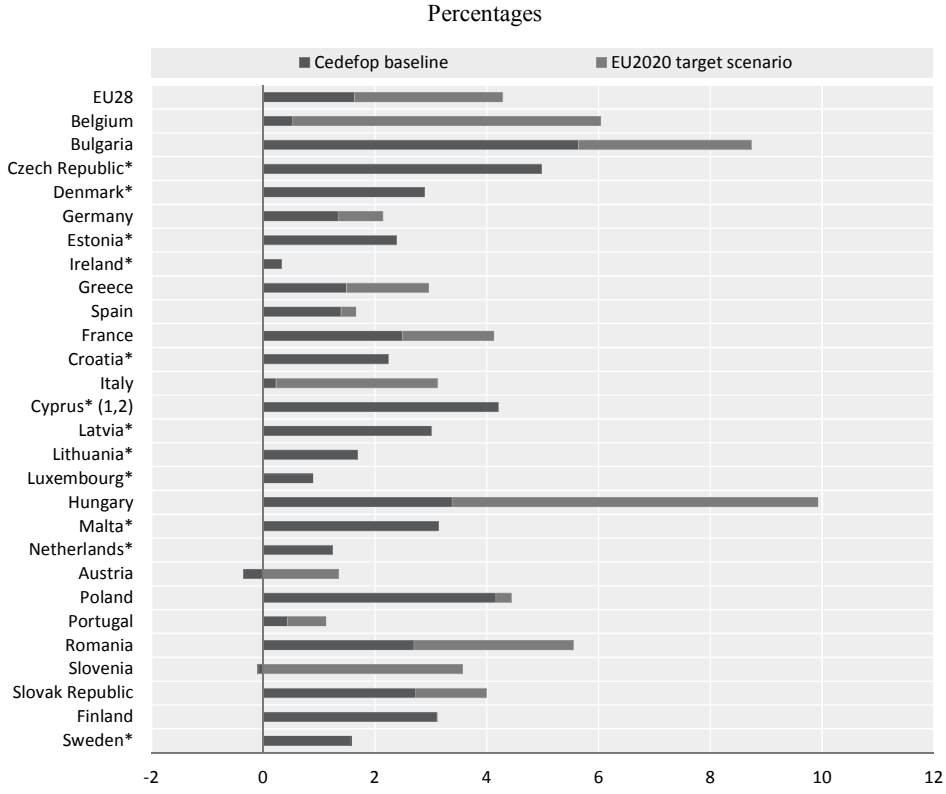


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Source: 2012 data based on Eurostat; 2020 data based on own calculations.

Figure 9.4. Projected growth of activity rates in EU member states, 2012-20: Cedefop baseline scenario and meeting the EU2020 national employment target scenario



Note: * indicates countries where the sustainable activity rate (*a**) will be achieved (or exceeded) on the basis of currently applied policies (as taken into account by the Cedefop baseline scenario).

1. Note by Turkey: The information in this chapter with reference to « Cyprus » relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

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Source: Cedefop calculations (see Annex 9.A1).

9.5. Conclusion

This chapter has analysed the impact on the European labour market of reaching the EU2020 employment rate headline target, with emphasis on the implications for labour supply shortages or surpluses. By examining alternative hypothetical scenarios that allow for different values of the unemployment rate, it is shown that meeting the employment target is dependent on considerable activation efforts by several EU member states, which will have to outweigh existing practices and policies. The magnitude of the population that needs to be activated in the European economy is significant. For example, if Europe were to accept an unemployment rate that exceeds 10% (i.e. a level close to what may be considered Europe's current structural unemployment rate), more than a quarter of the inactive population will have to be brought into the labour market by 2020 to achieve a 75% employment rate.

The nature of such activation will depend on the capacity for bringing different groups of the inactive population into the labour market, considering that activity rates vary markedly between individuals of different gender, age and levels of educational attainment. It is well understood in this respect that EU member states should direct their efforts towards increasing the relatively low activity rates of females, young and older individuals as well as those of lower educational level. However, the additional activation required will also be determined by the need to meet the wide range of anticipated skill needs in the European labour market, which will include jobs at both the higher- and the lower- end of the spectrum of skill requirements (Cedefop, 2013b).

While activation policies and better education and training are key ingredients for attaining this goal, the high fiscal cost imposed on debt-laden economies implies that other solutions will inevitably have to be explored. This is particularly the case considering the limits of stimulating the non-active domestic population, which is characterised to a certain proportion by individuals that cannot be brought into the job market due to severe health incapacities or other personal constraints. A reliance on higher levels of immigration may thus provide an additional option in the arsenal of policy makers for meeting Europe's diverse skill needs in the face of a shrinking workforce.

Notes

1. Vladimir Kvetan and Konstantinos Pouliakas undertook the data analysis and authored the chapter. The advice and support of Alena Zukersteinova, Antonio Ranieri, Giovanni Russo, Nicholas Sofroniou and Ioannis Katsikis is gratefully acknowledged.

2. Footnote by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

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4. See the annex for a fuller description of the model. The Cedefop model constitutes a powerful tool of labour market intelligence and its findings are publicly available through a web-interface maintained by Cedefop: www.cedefop.europa.eu/EN/about-cedefop/projects/forecasting-skill-demand-and-supply/skills-forecasts.aspx

5. For some European countries, particularly those currently under heavy fiscal consolidation programmes, these forecasts may be considered optimistic.

6. The model projects that employment will increase by a further 0.9% between 2020 and 2025, adding about another 2 million jobs to the aggregate EU28 employment pool.

7. In contrast, about 13 million jobs (0.75% percentage points annual growth in employment) are expected to be created between 2012 and 2020 if the national EU2020 employment targets are attained (74% EU average).

8. For the remainder of the chapter, we refer to these as "sustainable activity rates".

9. The activity rates of higher educated people are anticipated to be close to a 90% by 2020, in contrast to the much lower rates of 63% and 76% projected for the low- and medium-educated individuals.

10. Of course, national authorities in these countries may wish to expand their active workforce furtr for other reasons, including the adverse age dependency ratio which will put a greater strain on their social security systems. They may also wish to consider setting more ambitious employment targets.

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Annex 9.A1

The Cedefop pan-European forecasting model of skill supply and skill demand

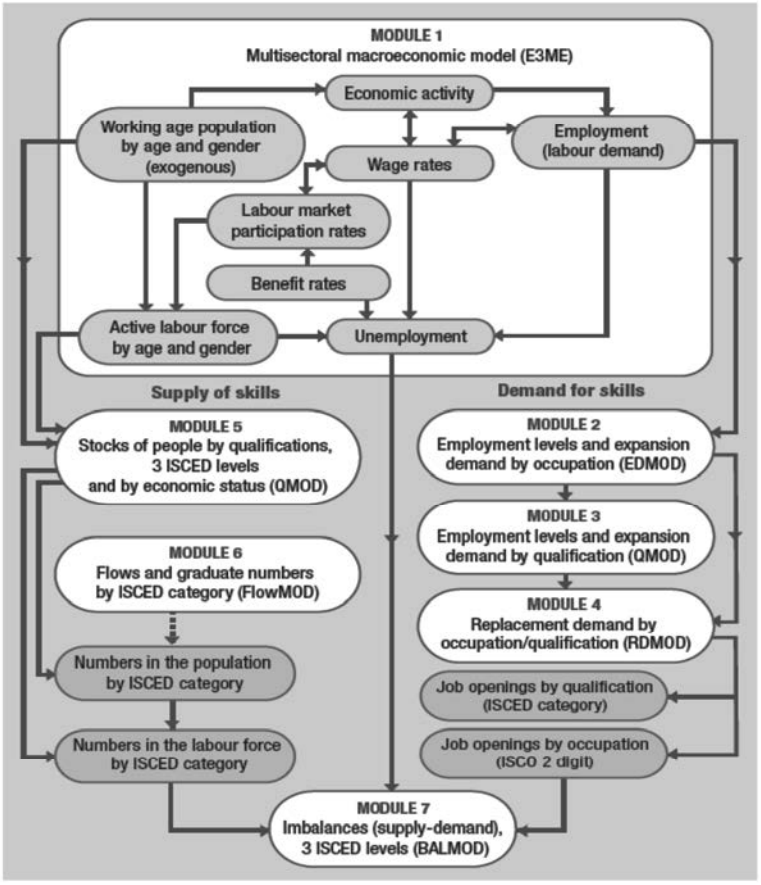
The modelling framework used to produce Cedefop's future skill supply and demand projections for the European economy is relatively complex.[1] It is based on several interconnected modules comprising of different labour market elements (see Figure 9.A1.1). This allows for the refinement of different modelling approaches used for projecting occupations, qualification structures and replacement demand. It also allows for improvement or replacement of data for particular countries or sectors when there are specific concerns about data quality and their robustness. Each module is associated with its specific database. This framework has been designed in order to promote further development, customisation and addition of new elements to the overall modelling exercise.

The information used to generate the labour demand and supply forecasts are based on official data sources. The database draws primarily on Eurostat sources. In particular it draws on Eurostat demographic data, national accounts (NA), the labour force survey (LFS) and additional data on flows of those acquiring and attaining qualifications. The LFS data, in particular, is subject to considerable scrutiny and analysis to avoid discontinuities and other problems. An important task in this respect is also the customisation of the LFS data in order to obtain detailed employment trends by occupations and qualification as well as for different labour supply estimates. Employment data are provided by national accounts, which are used for the overall modelling of macroeconomic and structural trends. Current changes of key classifications (i.e. the introduction of NACE rev. 2 and ISCO 08) are taken into account in the modelling framework.

The demand side involves four main elements (modules). The underlying macroeconomic module (E3ME model) produces a set of multi-sectoral macroeconomic forecasts.[2] This model delivers a set of consistent sectoral projections, which are transparent in terms of the assumptions made about the main external influences on the various countries (including technological change and the impact of global competition). This model combines the features of an annual medium-term sectoral model, estimated by formal econometric methods, with the some Input-Output modelling elements. It can be used for dynamic policy simulations and for forecasting and projecting macroeconomic variables over the medium and long term.

An occupational model (EDMOD) focuses on producing the estimates of expansion demand (employment growth) within sectors adopting common classifications and data sources. The occupational model (EDMOD) is based on European LFS data. The main advantage of the EU-LFS is that data collection is conducted on a rather frequent basis adopting standardised sets of questions and systems of classification. While there are still some differences across countries, the EU-LFS provides a broadly consistent set of data which can be used for producing occupational employment projections within the industries identified in macroeconomic models such as E3ME.

Figure 9.A1.1. Conceptual framework of modelling the demand for and supply of skills



Source: Cedefop (2012), "Skills Supply and Demand in Europe: Methodological Framework", *Cedefop Research Paper*, No. 25, Publications Office of the European Union, Luxembourg.

The qualifications module (QUALMOD), also using EU-LFS data as the main source of information, focuses on qualification intensities within occupations. The qualifications model (QUALMOD) translates occupational employment projections into anticipated demand for three measures of skills, defined by the three broad levels of formal qualifications consistent with the ISCED classification.[3]

The replacement demand module (RDMOD) has been built to reflect the crucial importance of considering not only changing occupational employment levels but also the need to replace those leaving the workforce because of retirement, net migration and occupational mobility. Estimating replacement demand is not straightforward and is quite sensitive to the data sources used. Information on age and gender structure is required because many labour market flows, especially retirements and occupational mobility, are age and gender specific. Age structures also vary significantly by occupation. While older-aged individuals tend to leave the labour market due to retirement, younger people change occupations more frequently, form families or migrate within regions or countries.

The supply side focuses on producing medium-term projections of skill supply, as measured by the highest qualification attained (consistent with the levels as defined in the QUALMOD module) defined by five-year age bands and gender. The models on the

supply side produce consistent pan-European skills supply projections, using existing data (skills measured by qualifications) which are compatible with the projections of skills demand (focusing on qualifications). Ideally, the modelling and forecasting of the supply of qualifications requires a detailed and comprehensive stock-flow model, with behavioural links which can be used to predict the distribution of people in the total population and labour force by qualification.

The main values of labour supply are modelled within an augmented E3ME model as a function of economic activity, real wage rates, unemployment rates and benefit rates. At present, model parameters are estimated for labour market participation in each country by gender and separately for different age groups. This is of key importance for modelling educational participation and attainment since these are known to be age specific. This expanded model framework is then used to create a detailed set of baseline projections for labour supply, disaggregated by country, age group and gender and covering a 10-15 year period. This forms a key input to the analysis of the supply of qualifications and skills and provides the link between economic activity and labour market supply.

The main motivation for the development of skill demand and supply forecasts is to identify potential labour market imbalances and skill mismatches. The final reconciliation and balancing of the supply and demand projections is undertaken by the module BALMOD. The aim of this module is to reconcile the skill demand and skill supply projections, focussing on qualifications. However, comparing current demand and supply projections is problematic for both practical and theoretical reasons. Unless the two sets of results are based on common data sets and are carried out simultaneously, they cannot be directly compared. There are also various other conceptual and methodological issues regarding imbalances that need to be considered. Using a RAS procedure, BALMOD distributes the available supply of people with qualifications to the jobs on offer, making certain assumptions about the patterns of unemployment rates for the three qualification categories (high, medium and low qualified).

The results produced by the Cedefop skill forecast model and key exogenous variables are the subject of continuous dialogue with experts from individual countries who have better insight of labour market trends and data sources in their own countries. The use of such a network of national experts (the so-called *Skillsnet* network) increases efficiency and transparency and ensures the robustness of the national empirical results.

Notes

1. The modeling framework as such has been designed and developed in cooperation with the Institute of Employment Research, University of Warwick and is described in detail in Cedefop (2012).
2. The E3ME model is developed by Cambridge econometrics. More information on this model is available in Cedefop 2012, or at the following link: www.camecon.com/EnergyEnvironment/EnergyEnvironmentEurope/ModellingCapability/E3ME.aspx.
3. Low qualification = ISCED 1 and 2; Medium qualification = ISCED 3 and 4; High qualification = ISCED 5 and 6.

Chapter 10

Occupational labour shortages: Underlying concepts and their role in US migration policy

Burt S. Barnow
George Washington University

There are many factors that can be taken into account in migration policy, such as family reunification, increasing the nation's stock of human capital, increasing gross domestic product, and alleviating occupational labour shortages. This chapter examines the concept of occupational labour shortages and describes how occupation-based immigration policy in the United States currently is structured and proposals that have been considered to improve how occupational labour shortages are measured and used in immigration policy. The chapter first explains the economic concept of occupational labour shortages and describes the reasons why shortages might arise. Next, the chapter discusses how occupational labour shortages can be recognised. This is followed by a summary of findings from an analysis of whether there are shortages for four occupations in the United States, and the conclusions from the study. The second part of the chapter deals with occupation-based immigration in the United States. The current US system for permanent and temporary labor is described, and current and past proposals for improving the system are discussed.

10.1. Introduction

There are many factors that a country can take into account in its migration policy, such as family reunification, increasing the nation's stock of human capital, increasing gross domestic product, and alleviating occupational labour shortages. Nations vary in how much emphasis they place on various goals and in how the goals are reflected in actual migration policy. This chapter examines the concept of occupational labour shortages and describes how occupation-based immigration policy in the United States currently is structured and proposals that have been considered to improve how occupational labour shortages are measured and used in immigration policy.

This chapter first explains the economic concept of occupational labour shortages and describes the reasons why shortages might arise (Section 10.2). Next, the chapter discusses how occupational labour shortages can be recognised. This is followed by a summary of findings from case studies of whether there are shortages for four occupations in the United States, special education teachers, pharmacists, physical therapists, and home care workers; the chapter then draws conclusions from the four case studies. Section 10.3 deals with occupation-based immigration in the United States. The current US system for permanent and temporary labour is described, and current and past proposals for improving the system are described and assessed. Section 10.4 provides conclusions.

10.2. Occupational labour shortages in theory and practice

The term "labour shortage" has no universally agreed upon definition. It sometimes refers to a shortfall in the total number of individuals in the labour force and sometimes denotes the possible mismatch between workers and jobs in the economy. We define an occupational labour shortage as a sustained market disequilibrium between supply and demand in which the quantity of workers demanded exceeds the supply available and willing to work at the prevailing wage and working conditions at a particular place and point in time. In general, the quantity of labour workers are willing to provide is an increasing function of the wages (i.e., price) they can obtain, and the relationship between the amount that workers are willing to provide at various prices, with other factors held constant, is referred to as the labour supply curve.

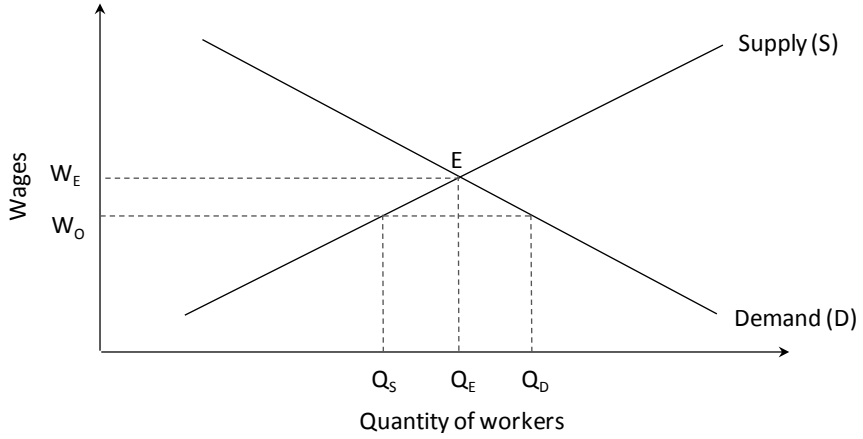
Figure 10.1 shows a typical upward-sloping supply curve for labour. As the wage rate is increased, more workers are willing to enter a particular occupation and current workers are generally willing to provide more labour. In Figure 10.1, the amount of labour that employers wish to hire at alternative prices is indicated by the downward-sloping demand curve. The point labelled E in Figure 10.1 is the market equilibrium point. If the wage is equal to W_E, then the quantity of labour that workers are willing to supply at that wage (Q_E) is exactly equal to the quantity of labour that employers will wish to hire. The market is in equilibrium because the quantity supplied is equal to the quantity demanded. If, for some reason, the prevailing wage rate in the market is W_0 rather than W_E, then the quantity of labour that workers are willing to supply is equal to Q_S – the point on the supply curve corresponding to W_0. Employers, however, would like to hire Q_D at that wage rate. The difference between the amount of labour that employers wish to hire and the amount that workers are willing to provide ($Q_D - Q_S$) is the amount of the shortage.

Unfortunately, identifying a shortage is not easy. Just as the concept of "full employment" does not mean zero unemployment, a labour market is likely to have some

vacancies in equilibrium; thus, the question is when are there excess vacancies that signify a shortage? Likewise, markets do not adjust instantaneously to shocks, so how long must a market have excess vacancies before it is considered to have a shortage? Drawing the line between a shortage and a tight labour market is not easy. Finally, in the United States, the Bureau of Labour Statistics does not publish data on vacancies by occupation, so even if there was agreement on what constitutes a shortage, the data needed to identify shortages does not exist.

Economists and other analysts have proposed alternative definitions of occupational shortages. Early studies by Arrow and Capron (1959) and Blank and Stigler (1957) defined shortages as situations where demand for labour increases faster than supply can grow – a situation sometimes observed in the market for engineers during economic booms; the Arrow-Capron and Blank–Stigler concepts of an occupational labour shortage are illustrated in Figure 10.2. Although rapid increases in demand can lead to labour shortages, there are other potential causes as well. As the baby-boomers reach retirement age, some occupations may experience rapid drops in labour supply, and if sufficient workers do not enter the occupation to replace them, a shortage may result. Shortages can also result when there are long periods required for employers or workers to become aware of or make adjustments to changes in supply or demand. For example, it takes many years to train physicians, so even when an increase in demand becomes apparent, there is no way for the supply to increase quickly. Finally, shortages can result when the labour market does not operate freely. Examples include where the wage is set by a third party, such as often occurs for health occupations, or when supply is limited by entry restrictions. Regulation of prices and wages is of particular interest in some US labour markets, such as health care.

Figure 10.1. Illustration of a labour shortage



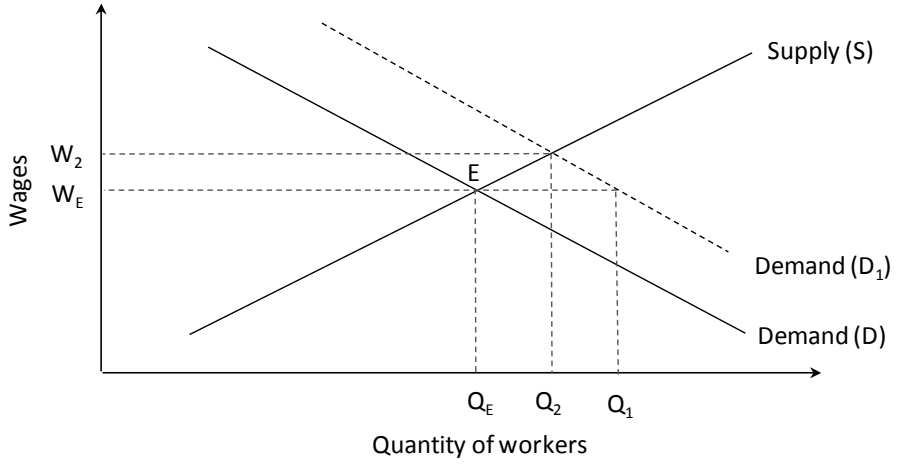
Source: Author's own work.

Although most prices are determined competitively by markets in the United States, the price of labour or the price of the final product is regulated in some industries. For example, cities generally regulate the price that taxi drivers can charge. In such instances, the supply curve is truncated at the regulated price. This situation is illustrated in Figure 10.3. The wage rate is restricted to be no higher than W_M, so the supply curve at higher wages is indicated by a dashed line. The labour that will be

supplied at that wage is Q_S. At that wage, however, the demand is for Q_D workers, so there is a shortage of $Q_D - Q_S$ workers. An example of this type of shortage during some periods is the US Government's market for entry-level Ph.D. economists. The federal government traditionally hires entry-level economists at the GS-12 pay level, and agencies are generally not permitted to pay a higher wage rate. Sometimes the market wage for entry-level economists is higher, so there is sometimes a shortage of entry-level Ph.D. economists in government agencies.

More commonly, the government regulates the prices of products and services rather than labour. In industries where labour comprises a relatively small share of the product's price, such as in the generation of electric power, product price regulation is not likely to cause a labour shortage. In very labour-intensive industries, however, output price regulation can be tantamount to regulating the price of labour. Examples include the health care industry in general and the home care industry in particular. A large share of the US health industry is financed by the Medicare and Medicaid programmes. In the case of Medicare, the federal government limits the reimbursements that providers can obtain for treating covered elderly patients. State governments provide similar regulation under Medicaid programmes for the poor. By restricting the charges that providers can make, the providers face limits on what they can pay workers and still cover their costs.

Figure 10.2. Illustration of Blank-Stigler and Arrow-Capron shortages



Source: Author's own work.

In the absence of vacancy measures, shortages can only be identified by employer actions to obtain additional labour: If a shortage exists, we would expect employers to undertake one or more of the following actions. The first thing we would expect to see is that employers would increase their recruiting efforts. Specifically, we would expect employers to take one or more of the following actions to expand recruiting:

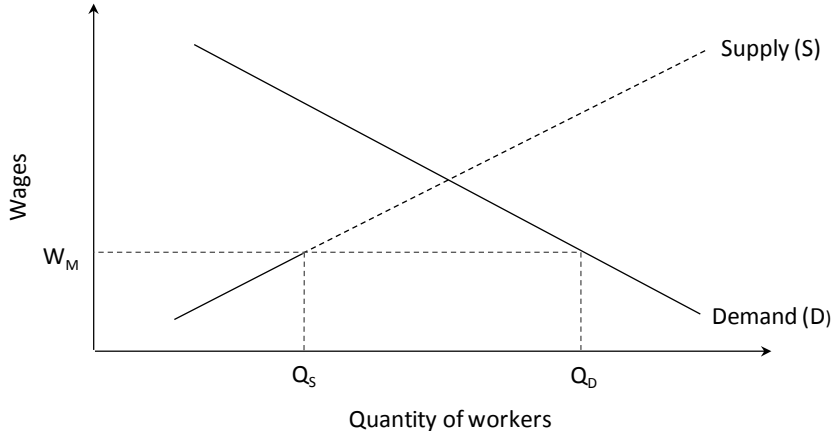
- increase advertising in usual outlets
- advertise in other media
- expand the recruiting area, possibly including other countries
- use public or private employment agencies

- pay bonuses to employees who bring in workers.

Other actions employers might take to eliminate a shortage include:

- increase use of overtime
- reduce minimum qualifications for the job
- restructure work to use fewer of "shortage" occupations
- substitute machinery and equipment for labour
- train workers for the jobs
- improve working conditions
- offer bonuses to new workers
- offer stock options to workers
- improve pay and fringe benefits
- contract out work
- turn down work.

Figure 10.3. Illustration of labour shortage arising from restrictions on wages



Source: Author's own work.

These options are not always available; for example, reducing the minimum qualifications is not feasible for a licensed occupation. Some of the actions can be undertaken quickly, such as increasing the use of overtime, but others, such as substituting capital for labour, might require several years to implement. Some of the options, such as use of overtime, are easy to reverse, but others, such as increasing pay and benefits, are likely to be hard to reverse. In conducting the case studies described below, we did not expect employers to undertake all the actions described above, but if there was a shortage, we expected employers to take some of these actions to alleviate the shortage.

We decided not to use a quantitative measure to define a shortage for our study because there is no simple way to aggregate the signs of a shortage, but others have

developed specific measures, particularly for use in immigration policy. These measures are discussed later in the chapter.

We conducted case studies of four occupations where we had seen press reports of shortages or where we found evidence of shortages in previous research: home care workers, pharmacists, physical therapists, and special education teachers. Identifying occupational labour shortages in the absence of vacancy data is challenging. In our case studies, we relied on interviews with employers, worker organisations such as unions, and academics and other researchers who studied the occupation, as well as analysis of data published by the Bureau of Labour Statistics, the Department of Education, and trade associations. In looking at published data, we expected that if there was a shortage, wages in the occupation should generally rise relative to occupations with similar requirements; exceptions to this expectation include situations where the wages are not market determined (such as many health care occupations) and if the comparison occupations are also experiencing a tight labour market. In the interviews with employers and trade associations, we looked for evidence that employers were undertaking some of the actions described above to deal with shortages. Interviews with worker associations and unions provide some balance, as employers sometimes claim there is a shortage, and workers counter that they are unwilling to use the extant workforce efficiently.

Perhaps in large part because the US economy was experiencing the worst recession since the Great Depression when we conducted our research, we did not find shortages in any of the four occupations. Even industry representatives, who often complained of shortages in our previous studies of home care workers and special education teachers, made no claims of a current shortage. Industry representatives indicated that there were shortages of pharmacists in the recent past when grocery stores began adding pharmacy sections and pharmacies extended their hours dramatically; however, as it became increasingly difficult to fill positions there was upward pressure on wages, and the demand for pharmacists declined. The labour market for home care workers is tight, but there was no evidence of widespread inability of people in need of such services to obtain them. Because home care is a relatively low-skill occupation with a short training period, one might not expect labour shortages, but in our prior work we found that government regulations on reimbursement for Medicare and Medicaid patients often led to difficulty in recruiting and retaining workers. Finally, our study of the market for physical therapists indicates that the market is very tight, but because of the severe recession, a shortage was not observed.

Several key conclusions emerge from the study in addition to the conclusion that there are no current shortages in the occupations studied:

Measuring occupational shortages is difficult

There are a number of reasons why it is difficult determine if a shortage is present. First, the best indication of a shortage is an increase in the number and duration of vacancies, but in the United States occupational vacancy data are not available for most occupations. Second, there is no precise dividing line between a tight labour market and a shortage. Third, the Standard Occupational Classification (SOC) system used in the United States measures occupations too coarsely for measuring shortages; for example, all computer programmers are included in a single occupation, but employers want programmers with specific skills such as Java or HTML. Finally, using interviews to assess the presence of a shortage is imprecise.

For policy purposes, it is important to go beyond the economic definition of a shortage

Sometimes labour markets do not provide the socially optimal number of workers in an occupation. This is particularly the case when the labour market is highly regulated by government. If rates of pay are set at a low level, the labour market will clear in an economic sense, but there may be what Arrow and Capron (1959) called a "social demand shortage", that is, the market produces less than what society would like.

Paradoxically, many occupations with persistently tight labour markets have recently increased or are considering increasing entry requirement

Pharmacists recently began requiring that entrants hold a doctorate degree, and the American Physical Therapy Association is striving to have all new physical therapists enter the labour market with a doctorate, and some have advocated that the minimum education for registered nurses be increased to a bachelor's degree. Although there may well be good reasons for increasing the educational requirements, the extra costs of increasing qualifications could exacerbate tight labour markets, as we observed in our case study of pharmacists.

Because of the importance of gathering good data on shortages, consideration should be given to improving data on job vacancies and the detail of occupational measurement

Occupational labour market information is crucial for activities including career guidance and immigration decisions. The lack of adequate vacancy data and measuring occupations at too high a level make it difficult to sort out the situation for specific occupations. Because increased government funding is currently difficult, collaboration with industries to alleviate these problems should be explored.

10.3. Using occupational shortage data for immigration and temporary visas

Occupational shortage data can play an important role in the determination of which occupations are good candidates for admitting temporary or permanent foreign labour to fill vacancies. In this section, we describe the approach used in the United States to assess the availability of US workers for jobs that employers wish to fill with immigrant or migrant workers, the approach developed for the United States Department of Labour by Malcolm Cohen, and the potential for changes in the system.

It is important to keep in mind that US immigration policy is based primarily on family reunification, with only a minority of permanent admittances based on employment needs of employers. As shown in Table 10.1, in fiscal year 2012, only 144 000 of the 1 032 000 granted permanent legal admissions, about 14%, were admitted through employment-based preferences (Monger and Yankay, 2013).

Table 10.1. Legal United States permanent resident flow by major category of admission for 2012

Category of admission	Number	Percentage of total
Family-sponsored immigrants	681 000	66.0
Employment-based preferences	144 000	14.0
Priority workers	39 000	3.8
Professionals with advanced degrees	51 000	4.9
Skilled workers, professionals, and unskilled workers	39 000	3.8
Special immigrants	8 000	0.8
Investors	7 000	0.6
Diversity programmes	40 000	3.9
Refugees and asylees	151 000	14.6
Parolees	1 000	0.1
Other	15 000	1.5
Total	1031 000	100.0

Source: Monger, R. and J. Yankay (2012), "US Legal Permanent Residents: 2012", US Department of Homeland Security, Office of Immigration Statistics, Washington, DC.

Although this chapter will focus primarily on the permanent admissions, the United States also has several employment-based temporary visa programmes with interesting features.[1] The H-1B programme allows foreign workers who are specialty workers or fashion models to work in the United States for three years, with possible renewal of an additional three years. The Department of Labour states that "A specialty occupation requires the theoretical and practical application of a body of specialised knowledge and a bachelor's degree or the equivalent in the specific specialty (e.g. sciences, medicine, health care, education, biotechnology, and business specialties, etc.)."[2] The number of visas permitted under the H-1B programme is currently set at 65 000 annually, but in some previous years over twice as many visas were authorised. Demand by employers for the H-1B visas greatly exceeds the annual cap, so a lottery is held each year. In the fiscal year 2013, the US Department of Labour processed 442 254 requests for 909 465 positions for the 65 000 slots available for the H-1B programme;[3] however the number of positions applied for is likely an overstatement as there is no penalty for not filling all approved positions. The top seven occupations for the requested H-1B visas were all IT related.

Temporary visas are also available for agricultural (H-2A) and non-agricultural (H-2B) openings that employers believe cannot be filled with American workers. The H-2B programme currently has a statutory cap of 66 000 workers annually (www.uscis.gov/working-united-states/temporary-workers/h-2b-non-agricultural-workers/cap-count-h-2b-nonimmigrants retrieved January 25, 2014). In the fiscal year 2013, employers requested certification for 98 000 positions, and 82 000 positions were certified; the surplus of requests over certifications does not imply excess demand, as requests can be turned down for many reasons having nothing to do with demand. As shown in Table 10.2, the requests for H-2B visas were generally for low-skill jobs such as landscape workers, amusement and recreation attendants, and waiters and waitresses. The H2-A programme does not include an annual cap; in the fiscal year 2013, 98 813 positions were certified.

Table 10.2. Top-10 occupations certified for H-2B temporary non-agricultural visas, fiscal year 2013

Occupation	Number of positions certified
Landscaping and groundskeeping workers	31 287
Forest and conservation workers	9 573
Amusement and recreation attendants	5 788
Maids and housekeeping cleaners	5 626
Meat, poultry, and fish cutters and trimmers	3 051
Construction labourers	2 106
Nonfarm animal caretakers	1 639
Waiters and waitresses	1 566
Coaches and scouts	1 553
Fishers and related fishing workers	1 282

Source: US Department of Labour, Office of Foreign Labour Certification. Retrieved from www.foreignlaborcert.doleta.gov/performancedata.cfm, January 25, 2014.

Employers who would like to hire permanent workers or temporary workers from abroad must submit the vacancy data and information about the applicant they wish to hire to the US Department of Labour's Office of Foreign Labour Certification to receive certification that the positions meet the federal requirements under the appropriate visa programme. The employer is required to recruit domestic workers for the position and be prepared to demonstrate that adequate recruiting was conducted and that no qualified domestic workers were available for the position; recruiting requirements are explained in the Code of Federal Regulations.[4] Furthermore, employers are required to pay at least the "prevailing wage" for the position to assure that domestic workers are not adversely affected by the employment of a foreign worker. In general, the prevailing wage is the mean wage of the occupation in the relevant labour market or the wage called for in a collective bargaining agreement. Recruiting requirements are much less specific when filing for H1-B workers.

When applying for permanent visas, employers can bypass the review by the Department of Labour's Office of Foreign Labour Certification for occupations that are on the Department of Labour's Schedule A. For many years, the only two occupations that have been on Schedule A are physical therapists and registered nurses. For all other occupations a review is required to assure that the employer has searched adequately for a domestic worker before offering the position to a foreigner.

Employers seeking to hire a foreign worker with permanent resident status must file with the US Citizenship and Immigration Services (USCIS) after their Application for Permanent Labour Certification is approved by the Department of Labour. There are restrictions on employment-related visas by employment preference category and by country. The four employer-sponsored preferences are:

- Priority workers, which includes aliens with extraordinary ability in the sciences, arts, education, business, or athletics; outstanding professors and researchers; and multinational executives and managers.
- *Professionals* with advanced degrees or persons with exceptional ability, which includes aliens who, because of their exceptional ability in the sciences, arts, or business, will substantially benefit the national economy, cultural, or educational interests or welfare of the United States; and aliens who are members of professions holding advanced degrees or the equivalent.

- *Professional or skilled workers*, which includes professionals with a baccalaureate degree; aliens capable of performing skilled labour for which qualified workers are not available in the United States; and aliens capable of performing unskilled labour for which qualified workers are not available in the United States.
- *Special immigrants*, which includes religious workers; Panama Canal Company employees, certain physicians, and others.[5]

The fiscal year 2012 limits on employment-related permanent visas are approximately 41 000 for the first three categories and 10 930 for the fourth and fifth categories (Monger and Yonkay, 2013). In addition, there is a limit of 7% of the permanent visas per country.

The current system for reviewing and certifying the need for foreign labour for temporary or permanent job openings is labour intensive. Until the system was revised and special temporary processing offices were opened, there was a backlog of over 300 000 cases, and the certification process often required several years. It is not surprising that the Department of Labour sought to develop measures that could be used to determine if foreign workers are needed based on data that are already available, in effect developing criteria for expanding Schedule A. In an effort to achieve this goal, the US Department of Labour retained Malcolm Cohen twice to develop approaches to use existing data to rank occupations as candidates for admission of foreign labour (Cohen and Schwartz, 1982; Cohen, 1990).[6] Cohen's approach is somewhat similar to the basic approach used in our research (Barnow et al., 2013). However, the Department of Labour wanted a quantitative ranking system based on regularly available data rather than a system that relied in part on interviews with knowledgeable parties. Cohen identified seven indicators of occupational shortages based on economic theory:

- employment change in the recent past
- occupational unemployment rate in the recent past
- wage change in the recent past
- training required for the occupation
- replacement demand
- projected increase in occupational demand
- immigrants certified in the recent past.[7]

In his 1990 report, Cohen created an index of shortage by developing a seven-point scale for each indicator and summing the score of the seven indicators. Thus, an occupation could receive a score between 1 and 49; in the 1990 study, the occupations with the tightest labour markets were for physical therapists and registered nurses, each of which scored 39. Although both of Cohen's reports were accepted by the Department of Labour, the government has never implemented the type of scheme he developed; this may be due to the fact that the processing backlog that was once several years has been reduced to a few months.

The United Kingdom, on the other hand, has implemented a system that makes use of comprehensive occupational shortage data and feedback from interested parties to identify shortage occupations that are eligible for immigration.[8] Under this system, the Migration Advisory Committee (MAC), which includes five economists and a representative of the UK Commission for Employment and Skills, makes recommendations to the government about which occupations are experiencing shortages.

The MAC only deals with occupations with highly skilled workers (Tier 1) and skilled workers (Tier 2). To qualify for inclusion on the list, an occupation must be skilled, have a shortage, and be a "sensible" candidate for the list, and these three criteria are applied sequentially. The MAC uses both top-down and bottom-up approaches in its work, relying on labour market data from national surveys and presentations and meetings with stakeholders. Once it is determined whether an occupation uses enough skills to qualify for Tier 1 or Tier 2, an assessment is made on whether the occupation is experiencing a shortage. The MAC uses 12 indicators in four broad categories to determine if there is a shortage (Downs, 2009).

The work done by Cohen and Schwartz (1982) and Cohen (1990) in the United States and by the MAC in the United Kingdom indicates that it is feasible to use labour market data to assist in the process of determining shortages for admission of foreign workers on a temporary or permanent basis. Although Cohen (1990) developed a numerical scale to rank occupations and the MAC approach also includes quantitative components, the flexibility of the MAC approach has the advantage of recognising the lack of a clear measure of a shortage and permitting qualitative data to be used in the process.

Immigration reform is a highly contentious issue in the United States today, but the controversies currently focus more on dealing with the undocumented worker population and border security than the appropriate mix of skill-based visas and family-based visas, the appropriate size of the H-1B visa cap, and how the employment-based system should operate. At the time this chapter was prepared, the US Senate had passed a bill in 2013, the Border Security, Economic Opportunity, and Immigration Modernization Act of 2013, but the House of Representatives has not yet acted, and it is not clear if or when US immigration reform will occur. Because the Senate bill includes some major changes to the employment-based component of immigration policy, it is briefly discussed here. Sumption and Bergeron (2013) analysed the Senate bill and present their best estimates of how immigration is likely to change if the bill is enacted. They note that the Senate bill places more emphasis on employment and skills based immigration and that the introduction of a points system, similar to what is used in some other nations, would likely reduce the waiting time for immigrants from some countries; the points system would also reward workers with US work experience and allow for some skilled workers to initiate the immigration process rather than rely on employers. In addition, the Senate bill would introduce a formal analysis of shortages for the first time, conducted by a new bureau within USCIS that is loosely modelled on the MAC. This analysis would be used to identify shortage occupations that would receive priority for the new low-skilled W visa in the event that they are oversubscribed. The bill would also make it more difficult for employers to hire low-skilled workers in localities where unemployment exceeds 8.5%, and it introduces a formula for adjusting the number of W and H-1B visas over time, depending on various metrics of demand.

10.4. Conclusion

For various reasons, labour markets do not always clear, sometimes resulting in occupational labour shortages. This chapter explores the reasons why occupational labour shortages can occur and identifies ways to ascertain if a shortage exists. Objective labour market information, such as vacancy rates, unemployment rates, and changes in wage rates can be useful in diagnosing shortages, but our research suggests that relying on market signals alone is sometimes misleading. The current US employment-based immigration system is extremely complex and is only partly responsive to market signals.

The US Department of Labour has considered moving to a system for where shortages are determined by formulas based on labour market data, but such a system has never been implemented. The immigration reform bill that recently was passed by the Senate but stalled in the House of Representatives expands employment-based immigration somewhat and includes a points system that rewarded education, skills, and prior employment in the United States. Based on our research on occupational labour shortages, the type of system used in the United Kingdom, which relies more on specific evidence as well as labour market signals, is likely to do a better job of identifying situations where the use of foreign labour is appropriate than the current system used in the United States. It should be kept in mind that immigration policy is at its heart political in nature, so the system adopted in a country must reflect the desires of the population rather than relying only on market signals.

Notes

1. The US immigration and temporary foreign labour system is far too complex to capture in a brief paper. The description below ignores many smaller programmes (such as a separate temporary visa programme for skilled workers from Chile) and special provisions (such as the ones for sheepherders).
2. Retrieved from www.foreignlaborcert.doleta.gov/h-1b.cfm on January 25, 2014.
3. Data on all foreign labour certifications were retrieved from www.foreignlaborcert.doleta.gov/performancedata.cfm on January 25, 2014.
4. The regulations for permanent workers are available at www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=10c56468aa6598a5caff8afa9ddc01dc&ty=HTML&h=L&n=20y3.0.2.1.27&r=PART#20:3.0.2.1.27.4.40.1 retrieved on January 25, 2014.
5. "I am an employer: How do I sponsor an employee for US permanent resident status?", US Citizenship and Immigration Services, Washington, DC, October 2013.
6. Cohen's work for the Department of Labour was later published as Cohen (1995).
7. In a presentation made at a symposium held by the Economic Policy Institute in 2009, Cohen indicated that job vacancies would be a good measure if they were available (see http://epi.3cdn.net/85ec6cf493f0f84caf_36m6baufj.pdf, accessed January 22, 2014).
8. The description of the UK system is based on Downs (2009) and a presentation by Martin Ruhs at the symposium held for this project. The Ruhs presentation is available at http://epi.3cdn.net/7329ec8745d286ac32_zbm6b9nzz.pdf (accessed January 22, 2014).

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Chapter 11

Migration in Europe: An overview of results from the 2008 immigrant module with implications for labour migration

Georges Lemaître
OECD

According to a new recent data source, it would appear that only a fraction of labour migrants in EU countries are actually recruited as labour migrants from abroad and that more high-skilled jobs are filled by migrants recruited in the country than those recruited from abroad. This same source suggests that retention rates for immigrants having the most favourable labour market outcomes tend to be lower and that half of highly skilled labour migrants are no longer in the same jobs for which they were initially recruited after five years.

These results suggest that shortage lists and labour market tests may not always be as relevant as generally considered as tools for regulating labour flows according to needs. Protection of domestic workers may best be ensured by seeing to it that wages and working conditions of first immigrant jobs are according to domestic standards.

In addition, ensuring greater retention, encouraging migrants to come with their families and inducing potential candidates to learn national languages will require more significant incentives than are currently offered. For this the right of permanent residence upon entry seems a likely candidate. Generally, the ability to obtain good employment and to demonstrate language proficiency needs to be rewarded far more than is currently the case in most countries.

It seems likely that the low levels of highly skilled labour migration in many European countries have less to do with low attractiveness than with the fact that employers are not recruiting significantly from abroad.

11.1. Introduction

International comparative analyses of the labour market outcomes of immigrants are based largely on labour force surveys (LFSs). This has advantages but it also has drawbacks which have, to a certain extent, retarded our understanding of international migration. Among the advantages are those inherent in any phenomenon captured through labour force surveys, namely a consistent picture over time based on common definitions and concepts. The downside is that such surveys do not identify one of the most important defining features of international migration, namely the reason for migration. We have learned from other sources, for example, that labour migrants have better labour market outcomes than family and humanitarian migrants, but we have no way of distinguishing between these various types of migration in labour force survey data and of examining their outcomes over time. We know that overall outcomes of immigrants tend to improve over time, but this clearly cannot be for labour migrants who arrive with a job, because integration for this group means that some of them will enter the ranks of the unemployed and of the inactive over time, so that their employment rates will decline. Our analyses based on labour force surveys tend to give a rudimentary and even distorting picture of labour market outcomes of immigrants, because they confound the various different types of movements. This is unfortunate because labour force surveys are our main comparative source of information on the labour market outcomes of international migrants.

We actually have singularly little cross-country information on the outcomes of the various types of migrants that are being admitted. As a result it is difficult to have a clear idea of the exact role which the various categories of migration (labour, family, humanitarian) play in the labour market with regard to satisfying skill needs. This is a critical point, because policy generally only has control over discretionary labour migration. Although governments do impose constraints on family and humanitarian migration, such as minimum income and lodging requirements or the need to satisfy the Geneva Convention criteria, these forms of migration cannot be stopped without calling into question commitment to basic human rights or without reneging on international treaties. Labour migration necessarily is conditional on the labour market role of these of other types of migrations, in the same way as it is conditional on the labour market role of native-born workers and previous migrants, but it is useful to know the role which all types of migration are playing, to have a better notion of the relative role of labour migration in particular.

Fortunately a recent (2008) data source makes it possible to examine the various categories of migration more closely. This is the ad-hoc immigrant module of the European Labour Force Survey. The analyses which follow are based largely on this data source and provide some insights into the nature of international migration in a number of European countries.

11.2. The data source

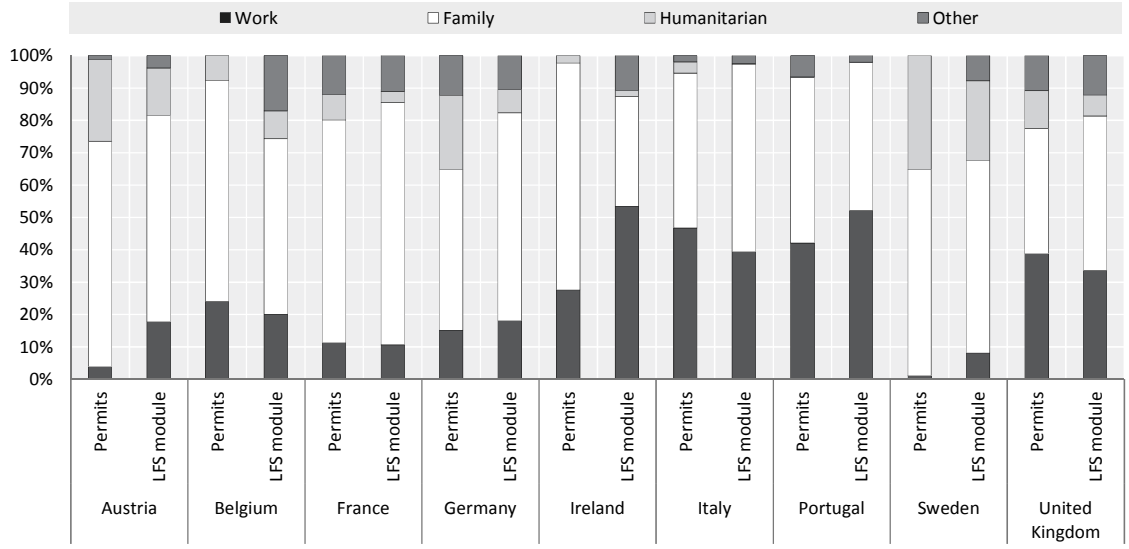
The 2008 ad-hoc module on international migration of the European Union Labour Force Survey was introduced in an attempt to obtain a more complete picture of international migration in Europe. It incorporated a number of questions of particular interest for our purposes, in particular one which asked the respondent the main reason for which he/she migrated. The responses were as follows:

- employment, intracorporate transfer
- employment, job found before arriving

- employment, no job found before arriving
- study
- international protection
- accompanying family/family reunification
- family formation
- other.

Ideally one would like to have information on the first permit granted upon entry or after arrival, because it is the data item which reflects immigration policy and the link between policy interventions and outcomes is of particular interest. However, since there may be significant numbers of respondents who may have arrived in an unauthorised fashion and were subsequently regularised and some who may still be unauthorised,[1] obtaining permit information on the first permit may be delicate, if not necessarily problematical. Notwithstanding the presence of unauthorised immigrants in the sample in some countries, the difference in the aggregate between the distribution of immigrants by reason for immigrating over the four years up to and including 2008 and the OECD standardised statistics for 2005-08 (non-EU migrants) is reasonably good[2,3] (see Figure 11.1) and the labour market outcomes, as will be seen, do generally correspond to what administrative data tell us about outcomes for the various categories of migration. This suggests that one can have some confidence in the module data,[4] even if the differences in the percentage of labour migrants between labour force survey data and administrative statistics is not insignificant for some countries (Austria, Ireland).

Figure 11.1. A comparison of labour force survey and of OECD standardised permit data (non-EU migrants), 2005-08 cumulative



Source: Eurostat Labour Force Survey ad-hoc immigrant module and OECD standardised immigration.

11.3. International migration by reason for migrating

Table 11.1 gives a breakdown of the reasons for migrating given by respondents by region of destination and EU/non-EU migrant.

Table 11.1. Distribution of immigrants for reason for migrating, region of destination and of origin, all immigrants and those entering in 1999-2008

		Employment, intracorporate transfer	Employment, job found before migrating	Employment, no job found before migrating	Study	International protection	Accompanying family/Family reunification	Family formation	Other	All reasons	Share of total migration
All immigrants											
Southern Europe	EU migrants	3	11	16	5	-	17	18	30	100	5
	Non-EU migrants	1	10	48	3	1	26	5	6	100	34
Northern and Western Europe	EU migrants	5	14	24	9	1	19	13	15	100	19
	Non-EU migrants	3	5	12	15	10	29	14	12	100	42
Recent migrants (1999-2008)											
Southern Europe	EU migrants	3	9	19	4	-	14	13	38	100	3
	Non-EU migrants	-	10	49	3	1	28	4	4	100	40
Northern and Western Europe	EU migrants	7	15	26	11	-	16	9	16	100	17
	Non-EU migrants	4	5	10	16	11	27	16	11	100	39

Note: Southern Europe comprises Greece, Italy, Portugal and Spain. Northern and Western Europe includes Austria, Belgium, Germany, France, Ireland, Lithuania, Luxembourg, Sweden and the United Kingdom.

Source: Eurostat Labour Force Survey ad-hoc immigrant module.

Before we comment on these results, a few words concerning the presentation of the data in this table and in other tables and figures in this chapter.

First of all, the sample sizes for the immigrant module are small, so one often needs to aggregate across countries of destination to obtain sufficient samples on which to draw conclusions. This is all the more the case here because the focus of the analysis is largely immigrants who entered in the ten years prior to 2008. We retained this restriction because we would like the results to reflect recent migration patterns, not those which were prevalent 20 to 40 years ago. As the results in Table 11.1 show, however, there does not appear to be much difference between recent migrants and all migrants in the distribution of migration by reason. We will nonetheless maintain the focus on recent migrants, because what may be true for the distribution of migrants by the reason for migrating may not be true in general for other characteristics. Since we wish to draw some implications for policy from the results, it is preferable that these be based on recent migration patterns as well as labour market outcomes.

In what follows country data have been aggregated into two groups, namely Southern Europe (SE) and Northern and Western Europe (NWE). The nature of migration to these two regions has been very different, with, in Southern Europe, few restrictions on occupational skill levels for which migration is allowed and a very high proportion of labour migrants, especially from non-EU countries (almost 60%, of all migrants – excluding intracorporate transfers – being labour migrants). The corresponding percentage for Northern and Western Europe is scarcely 15%.

Secondly, free circulation migration is clearly not subject to the same restrictions as that from so-called "third countries"; migrants moving under a free circulation regime are free to come and go as they please and in particular, do not need to have a prior job in order to be admitted as labour migrants. The results will thus generally be presented separately in what follows for EU migrants and non-EU migrants.

Despite the general agreement of LFS results with permit data mentioned earlier (modulo the coverage differences), there are a number of anomalies in the data which are difficult to explain *a priori*. The first concerns the percentage of persons who said they came for employment, but indicated that they did not have a pre-arranged job. In European countries, especially those in Northern and Western Europe, labour is generally demand-driven, with immigrants almost always required to have a job offer in principle before they can be admitted. However, it is almost certainly the case that employers are unlikely to hire a worker sight unseen, so some contact must exist before recruitment takes place, either directly through an interview or a prior contact or through an intermediary who can vouch for the recruit, which can be an existing worker, a recruitment agency, or through some other means. How labour migrants will respond if they are asked whether they had a job before arrival, when they were interviewed for their first job in the country of destination, is not entirely clear. One may conceive of such persons as arriving with a job, since the contact and interview request came while the candidate was abroad, but the hiring decision may have taken place while the candidate was in the country and this may be the determining element in their response to the LFS question. Finally in-country hiring may reflect unauthorised migrants who find work after arrival, or persons admitted under other statuses (including tourists) using these as expedients to enter the country to search for work.

Table 11.1 shows that that most non-EU self-declared labour migrants in both SE and NWE reported that they had arrived without a job in hand. The percentages are about 81% (48/59) in SE and about 60% in NWE. For recent migrants, those having arrived in the previous ten years, the results are similar. Of those who arrived with a job in NWE, about a third among EU migrants and a half among non-EU migrants were intracorporate transfers. If one excludes these, who properly speaking were not hired from abroad but merely transferred from an affiliate of the enterprise, the percentages are even higher. In other words, under migration regimes existing between 1998 and 2008, more labour immigrants were sourced from within the country than from outside; many labour migrants thus did not migrate in response to a precise recruitment effort by a domestic enterprise.

This is strongly at odds with the notion that recruitment of labour migrants from non-EU countries is occurring primarily from abroad. It is difficult to know how much of this may be due to labour migration, authorised or not, being recorded or having occurred under another status. Labour migrants arriving with and without jobs, for example, can be expected to differ in a number of respects. For example, one would expect that labour migrants negotiating a job from abroad would be less likely to take on work for which they perceive themselves to be overqualified, whereas those arriving without jobs may be willing to take on such work, in order to establish a foothold in the country of destination and to recoup the cost of their migration. We will examine this issue further below.

A second anomaly in the data concerns the "other" reasons reported by immigrants, which accounts for 30% of all EU migrants in Southern Europe and almost 40% of recent EU migrants in that region. Most of this (80-90%) consists of inactive EU15 migrants in Spain, but the age distribution does not suggest retirement migration, as one might have surmised. Other characteristics provide no clear indication, For Northern and Western Europe, there is no simple characterisation of this group. We will nonetheless include the "other" group in what follows, recognising that migrants characterised under this rubric remain something of an unknown.

The coverage of immigrants in the module is also uncertain. Certain immigrants may be excluded from interviews, for example, those remaining for short periods, and the interval between the drawing of the sample and the holding of the survey may means that some

immigrants may no longer be present when the survey is conducted. Response rates are also known to be lower among immigrants, because of both the possibility of language difficulties and because immigrants often belong to demographic groups who are harder to interview (e.g. young men).

Nonetheless, despite the anomalies and uncertain coverage, the data generally hold up well to scrutiny, as will be seen. In what follows, the two types of family migration will on occasion be grouped together and international protection aggregated with "other" reasons for migrating in presenting the results. The three employment categories will be kept separate, because it is these which will often be the focus of interest. The objective is to extract as much information from this data source about the nature of migration into EU countries, with a view to drawing out some implications for policy. This may involve making certain assumptions about the data, which the limitations of the data source and the small sample sizes make necessary.

11.4. The evolution of the distribution of reasons for migrating by years of residence

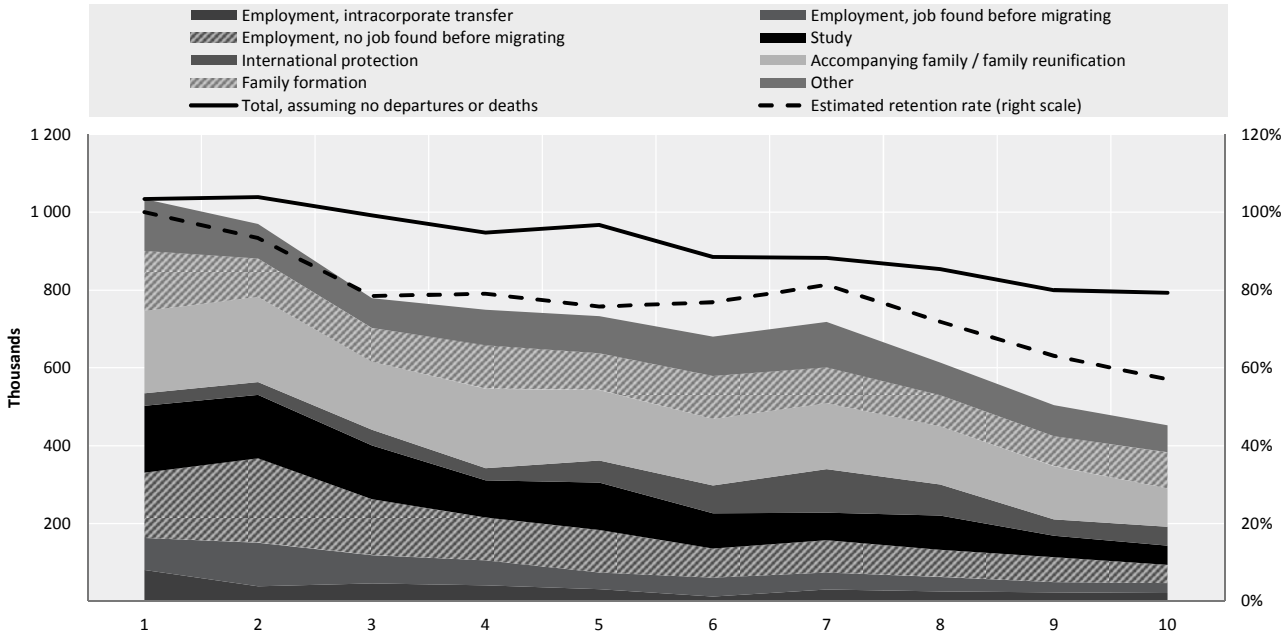
Not all immigrants who arrive in a country, even those granted the right of permanent residence upon entry, settle definitively. Some never intended to, but some may have done so but found that their expectations were not realised and, disappointed, return to their countries of origin. Still others, for example international students who complete their studies, may wish to stay but may not satisfy the conditions needed to do so, such as finding a job in the field in which they studied.

The immigrant module does not follow immigrants over time, but some indication of the evolution over time of the immigrant presence can be obtained by analysing differences in cohorts of different years of residence. One problem with this approach is that the cohorts are not all of the same size, so that variations in cohort size can confound analyses of the immigrant presence over time. For this reason, the cohort sizes have been adjusted in what follows using annual national data on inflows. This has been carried out for data for Northern and Western European countries only, however; the historical, official national inflow data for Southern Europe are subject to many undercoverage problems (due to high levels of unauthorised migration), making a plausible historical adjustment impossible.

Figure 11.2 shows the evolution, by years of residence, of immigration into Northern and Western Europe by category of migration. EU and non-EU migration have been grouped together for this analysis, because of sample size problems. The line at the top gives what the totals for the years of residence in question had been, if there had been no departures or deaths. The absolute numbers here should not be taken at face value; the trends reflect those observed in national inflow data, but the levels are those estimated in the labour force survey.

The data show the expected decline in the number of immigrants with years of residence; part of this decline, however, is attributable to the fact that immigrant numbers in past years were smaller. The topmost line gives the estimated cohort size for the entry year corresponding to the given year of residence. The ratio of the total observed number of immigrants still present to the cohort size for the year in question then provides a measure of the retention rate (modulo mortality); the estimate is approximately 75% after five years of residence and 57% after ten years. The figure also suggests that it is the employment and study components of international migration which have declined the most. Approximate estimates are that about 30-40% of persons migrating for employment or study reasons are still present 8-10 years after arrival, but about 55-60% of persons moving for family, international protection or other reasons Table 11.2).

Figure 11.2. Immigrants by reason for migrating and duration of residence (years), Northern and Western Europe, 2008



Note: The total curve is estimated using trends from national inflow statistics, *OECD Immigration Database*.

Source: Eurostat Labour Force Survey ad-hoc immigrant module.

Table 11.2. Estimated retention rates of recent immigrants after 4-6 and 8-10 years of presence, by reason for migrating, EU and non-EU migrants, Northern and Western Europe, 2008

Percentages

	4-6 years	8-10 years
Employment, intracorporate transfer	35	29
Employment, job found before migrating	63	37
Employment, no job found before migrating	59	36
Study	60	37
Accompanying family / family reunification	88	60
Family formation	68	54
Other	72	58
All reasons	**70**	**51**

Note: The observed LFS estimates have been adjusted to ensure that the trend for all reasons agrees with that observed in national inflow data.

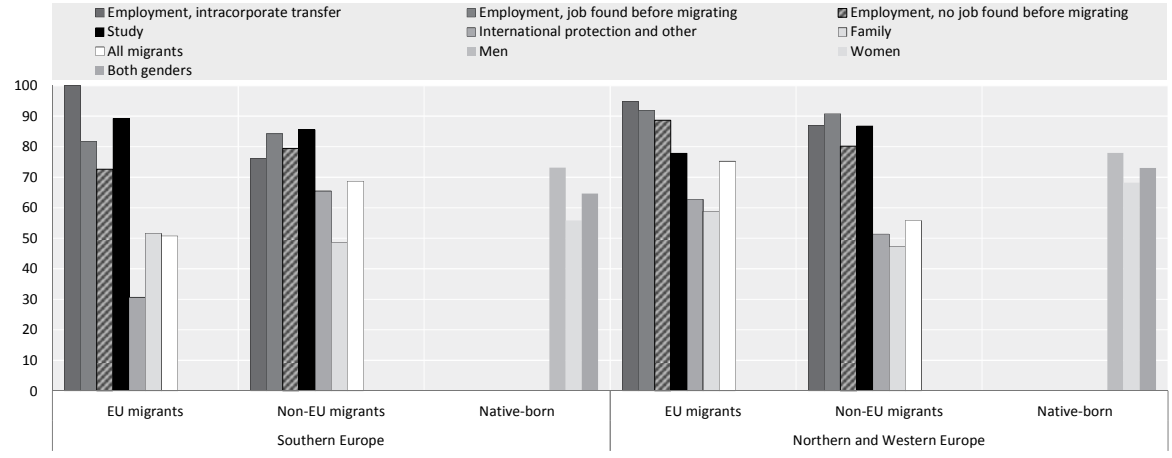
Source: Eurostat Labour Force Survey ad-hoc immigrant module.

11.5. Employment rates by category of entry and their evolution with years of residence

The requirement that migrants have a job before arrival would lead one to expect labour migrants to have very high employment rates in the early years of settlement compared to other migrants. The situation of persons declaring themselves to be labour migrants, but not having a prior job, is less certain, however.

The employment outcomes by self-declared reason for migration agree well with these expectations (Figure 11.3), with persons arriving with jobs showing the highest employment rates, generally close to or over 80%.[5] Those identifying themselves as migrating for work but without a prior job also show high rates of employment, more similar to those arriving with jobs than to family, international protection and other migrants (50% or more). The rates are, however, lower than those of persons arriving with jobs, so that there does appear to be a penalty associated with this kind of migration.

Figure 11.3. Employment rates of recent immigrants (10 years of residence or less) by reason for migration and of native-born persons of the same age distribution, 2008



Source: Eurostat Labour Force Survey ad-hoc immigrant module.

Persons arriving for study show relatively low employment rates as well, but this is attributable to not having completed their studies. The rates for persons in the country for ten years or less have been replaced by those in the country between 11 and 19 years in the figure. For these durations, they show employment rates comparable to those of persons migrating for employment.

Whether or not persons declaring themselves to be labour migrants actually entered as labour migrants, their labour market behaviour does tend to resemble that of other labour migrants. Thus it would seem that it is less having a job upon arrival than the reason for migrating that matters as far as labour market outcomes (measured through the employment rate) are concerned. Self-declared labour migrants without prior jobs attain much higher employment rates than family and humanitarian migrants and they do so relatively quickly.

Figure 11.4a tracks employment rates for immigrants at different years of residence and reasons for migrating for both EU and non-EU migrants. To reduce sampling variability, the rates shown have been averaged over three years centered on the year of residence indicated. For the purpose of these figures, data for all European countries have been

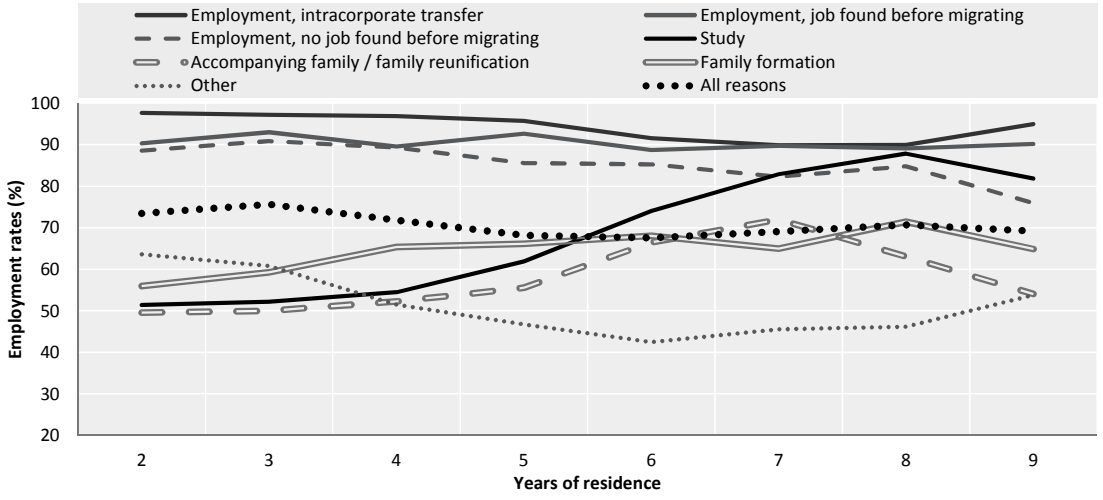
pooled. The data show, for non-EU migrants, a slight deterioration in outcomes over time for persons entering for employment reasons and a significant increase for persons entering for family, international protection and other reasons as well as for persons who entered for study. The latter reflects, for many of them, the completion of studies and entry into the work force. Over all reasons for migrating, the progression is from about 50% in the second year of residence to close to 70% in the ninth year.

Figure 11.4a. Employment rates by reason for migrating and years of residence (three-year moving averages), non-EU migrants, EU countries, 2008



Figure 11.4b shows a similar picture for EU migrants arriving for employment reasons, but generally less improvement for immigrants entering for family and other reasons. Note, however, that the latter have much higher employment rates in the early years after arrival than do non-EU migrants. Overall, EU migrants, if anything, show a deterioration in employment rates over time from about the mid-1970s to about 70%.

Figure 11.4b. Employment rates by reason for migrating and years of residence (three-year moving averages), EU migrants, EU countries, 2008

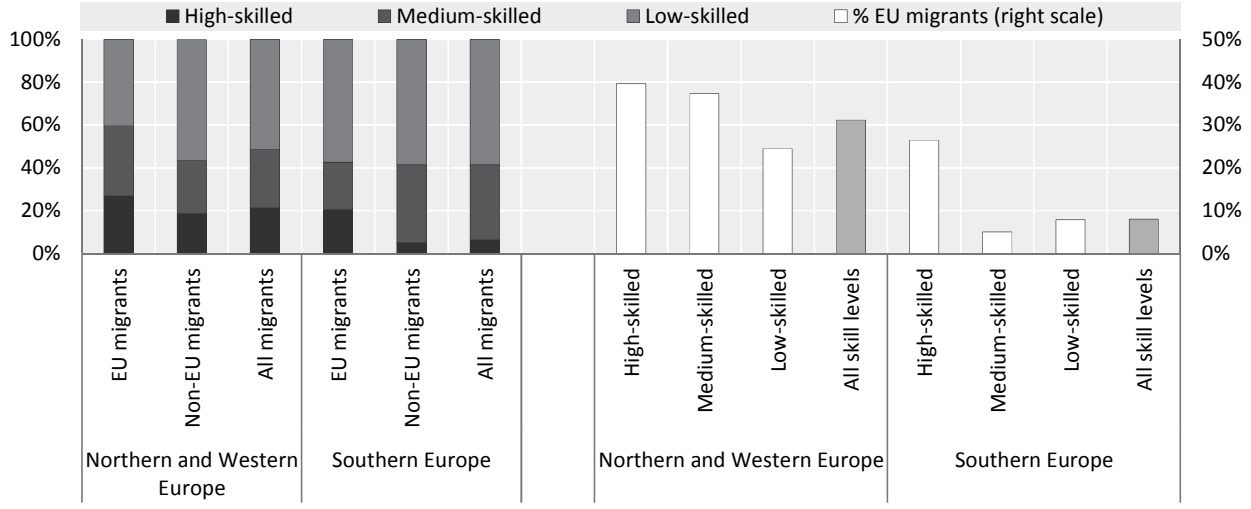


Source: Eurostat Labour Force Survey ad-hoc immigrant module.

11.6. Occupation skill levels of recent immigrants and overqualification

The distribution of skill levels of jobs held by EU and non-EU migrants are fairly similar (Figure 11.5), which suggests that the persons recruited from these two regions may be substitutable. In the short- and perhaps medium-term, the availability of labour from the new member states may have reduced the need for workers from non-EU countries, but as economic conditions improve in EU origin countries, the flows from EU countries are likely to decline and demand for workers from the non-EU side to expand.

Figure 11.5. Recent international migrant workers by skill level and region of origin and destination, 2008



Note: EU workers are a more significant component of the immigrant labour market in Northern and Western Europe (NWE) than in Southern Europe (SE), undoubtedly because of the higher wages there relative to those of Southern Europe.

Source: Eurostat Labour Force Survey ad-hoc immigrant module and OECD standardised immigration.

Table 11.3 gives a more complete picture of the distribution of occupation skill levels among persons specifying diverse reasons for migration. This is compared to the distribution for a native-born population with the same age distribution. Generally labour migrants who arrive with a job offer are in jobs which are more highly skilled than those of the corresponding native-born, except for non-EU migrants in Southern Europe. This is also the case for accompanying family/family reunification EU migrants in this region.

Over 70% of non-EU study migrants who have been in the country for 11-19 years are in high-skilled jobs, the highest percentage for non-EU migrants of any group. Generally less than 10% of recent non-EU family migrants and under 5% of persons entering for international protection are in high-skilled jobs, although one might expect that this average for all persons having arrived over the previous ten years would show some increase over time.

Table 11.3. Occupational skill levels of recent (10 years of residence or less) EU and non-EU migrants, by reason for migrating and region of destination, 2008

Percentage

Southern Europe		Job skill level			Total
		High-skilled	Medium-skilled	Low-skilled	
Employment, intracorporate transfer	EU migrants	88	12	-	100
	Non-EU migrants	35	24	41	100
Employment, job found before migrating	EU migrants	38	38	24	100
	Non-EU migrants	7	47	47	100
Employment, no job found before migrating	EU migrants	17	41	42	100
	Non-EU migrants	4	45	51	100
Study	EU migrants	16	7	77	100
	Non-EU migrants	71	16	13	100
Accompanying family / family reunification	EU migrants	49	27	25	100
	Non-EU migrants	3	28	70	100
Family formation	EU migrants	27	26	47	100
	Non-EU migrants	10	22	68	100
International protection	EU migrants	nr	nr	nr	100
	Non-EU migrants	4	38	58	100
Other	EU migrants	16	12	72	100
	Non-EU migrants	14	40	46	100
All reasons	EU migrants	25	23	52	100
	Non-EU migrants	5	39	56	100
Native-born	Men	25	43	32	100
	Women	23	27	49	100
	Both genders	24	35	41	100

Northern and Western Europe		Job skill level			Total
		High-skilled	Medium-skilled	Low-skilled	
Employment, intracorporate transfer	EU migrants	51	33	16	100
	Non-EU migrants	60	22	18	100
Employment, job found before migrating	EU migrants	38	37	25	100
	Non-EU migrants	55	27	17	100
Employment, no job found before migrating	EU migrants	19	44	38	100
	Non-EU migrants	23	37	40	100
Study	EU migrants	36	22	42	100
	Non-EU migrants	72	17	11	100
Accompanying family / family reunification	EU migrants	56	22	22	100
	Non-EU migrants	9	24	67	100
Family formation	EU migrants	22	29	49	100
	Non-EU migrants	12	26	63	100
International protection	EU migrants	5	21	74	100
	Non-EU migrants	6	23	70	100
Other	EU migrants	28	27	45	100
	Non-EU migrants	21	26	53	100
All reasons	EU migrants	31	33	36	100
	Non-EU migrants	18	26	56	100
Native-born	Men	34	38	28	100
	Women	31	32	37	100
	Both genders	32	35	32	100

ISCO: International Standard Classification of Occupations.

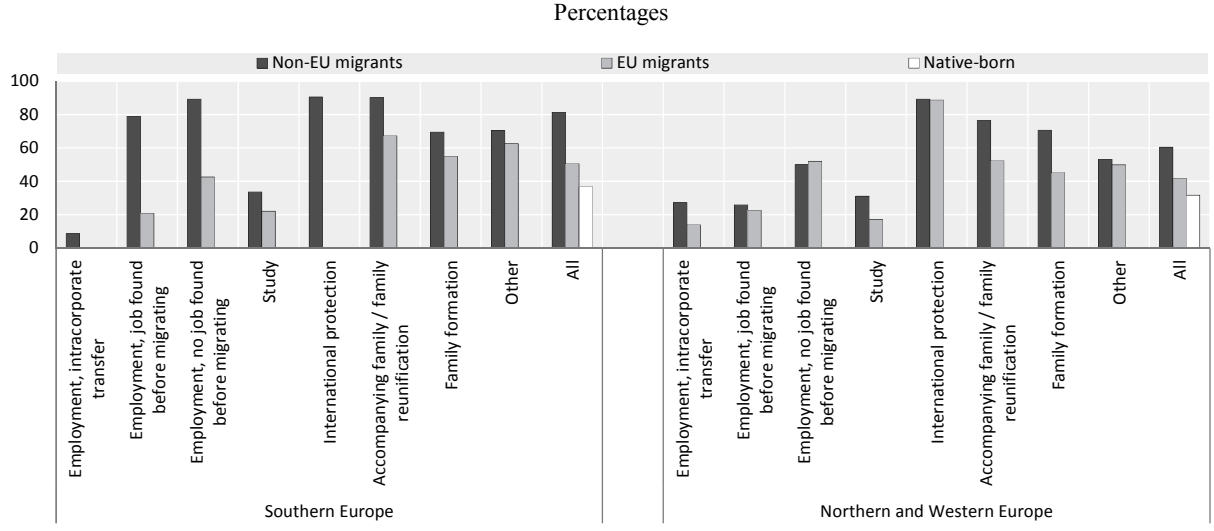
Note: High-skilled corresponds to ISCO 1-3, medium-skilled to ISCO 4-8 and low-skilled to ISCO 9.

Source: Eurostat Labour Force Survey ad-hoc immigrant module.

The rather low percentage of immigrants in high-skilled jobs may reflect some overqualification problems and this is indeed what one finds (Figure 11.6). On average fully 80% of recent non-EU migrants in Southern Europe and 60% in Northern and Western Europe (NWE) are nominally overqualified for the jobs they occupy. For

EU migrants the corresponding overqualification rates are approximately 50% in SE and 40% in NWE. The figure for the native-born of the same age distribution is about 37% in Southern Europe and 32% in Northern and Western Europe. Migrants who migrated for labour (with a job upon arrival) and study show much lower overqualification rates in NWE but only for intracorporate transfers and study migrants in SE. Those moving for international protection have the highest overqualification rates of all. Non-EU migrants have overqualification rates which exceed those of EU migrants by some 10 to 30 percentage points depending on the category and the region of destination. Note that non-EU migrants who arrived without a job in NWE have much higher overqualification rates than those who arrived with a job and differ more from the latter than was the case for employment rates. This does suggest that they have had to "settle" for jobs after arrival and have not had the luxury to refuse jobs not commensurate with their educational attainment.

Figure 11.6. Overqualification rates of recent immigrants by reason for migrating and of native-born persons of same age distribution, 2008



ISCO: International Standard Classification of Occupations.

Note: A worker is deemed to be overqualified if holding a tertiary degree and working in a job classified as medium or low-skilled (ISCO 4-9).

Source: Eurostat Labour Force Survey ad-hoc immigrant module.

Do the overqualification rates improve with years of residence? Table 11.4 provides some results on this and the picture is a complex one. First of all, persons who migrated for international study show large reductions in overqualification rates over time, for the obvious reason that they have gone from student jobs into regular employment after completion of studies. Family and other migrants do not generally show a decline in overqualification rates over time, except for EU migrants in NWE. Finally among labour migrants, highly educated EU migrants show the expected decline in overqualification rates with years of residence, but not non-EU migrants, who show no change in Southern Europe and a deterioration in Northern and Western Europe. Recall, however, that the two columns in the table represent different cohorts, so that one cannot be entirely certain that one would observe the same effect in the same cohort over time. In addition, certain migrants may have left the country and if those who left have tended to be less overqualified than those who remained, then their departure would mechanically increase the overqualification rates over time.

Table 11.4. Overqualification rates by years of presence in country, origin and destination countries and reasons for migrating, 2008

Percentages

		Reason for migrating	1-5 years	6-10 years
Northern and Western Europe	EU migrants	Employment	37	20
		Study	53	36
		Family and other	54	44
		All migrants	46	34
	Non-EU migrants	Employment	31	39
		Study	77	40
		Family and other	73	72
		All migrants	64	56
	All origins	Employment	34	32
		Study	72	39
		Family and other	67	66
		All migrants	57	50
Southern Europe	EU migrants	Employment	32	20
		Study	-	-
		Family and other	59	64
		All migrants	49	52
	Non-EU migrants	Employment	84	86
		Study	63	38
		Family and other	84	80
		All migrants	83	62
	All origins	Employment	76	80
		Study	59	41
		Family and other	78	76
		All migrants	76	76

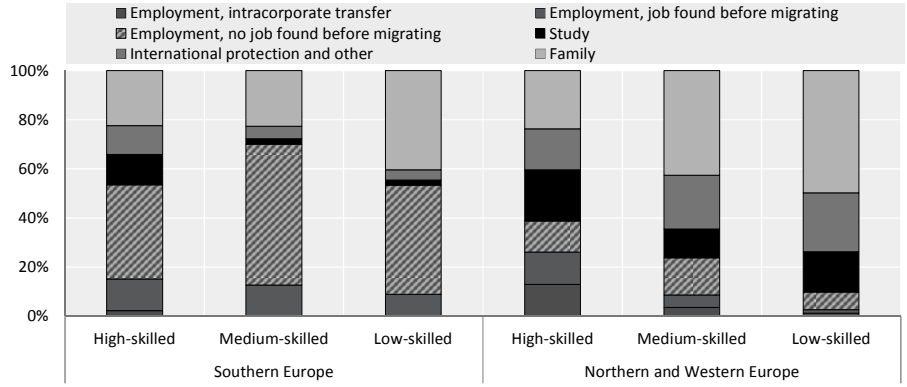
Source: Eurostat Labour Force Survey ad-hoc immigrant module and OECD standardised immigration.

11.7. Sources of skills

If labour migrants are largely the ones recruited from abroad to satisfy specific labour needs in the country, persons entering for other reasons also represent an important contribution to the work force. They may be significant sources of labour for high-skilled jobs and if many of them, as has been seen, are overqualified for the jobs which they occupy, they may be especially productive in these jobs. Indeed, studies have shown that overqualified persons have a wage premium in their jobs relative to other persons of lower educational attainment in the same occupations.

How important are labour migration channels for satisfying skill levels, and in particular, in meeting needs in high-skilled jobs? In Southern Europe, this is very much the case, with some 50 to 70% of recent immigrants in high-skilled jobs having come for employment reasons (Figure 11.7). For high-skilled jobs in Northern and Western Europe, the percentage is not quite 40%, and drops to about 25% for the medium-skilled and barely 10% for the low-skilled. Thus in NWE, family and other migration provide most of the labour for jobs at all skill levels, and more at lower than at higher skill levels. One question of interest then is whether high-skilled jobs which are filled by non-labour migrants are in any way different from those filled by labour migrants and, in particular, by those recruited from abroad. In other words, does recruitment from abroad, often in response to particular labour needs, translate into a manifestly different distribution of occupations held by immigrants recruited in this way, compared to immigrants recruited from within the country, many of whom did not even migrate for employment reasons?

Figure 11.7. Distribution of skill levels by reason for migrating, recent non-EU migrants, Southern Europe and Northern and Western Europe, 2008

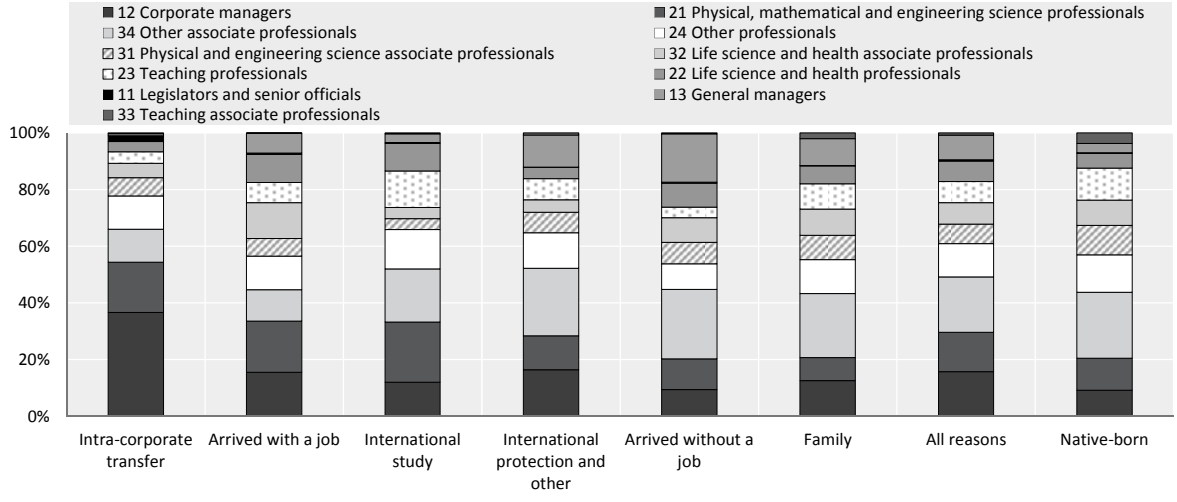


Note: The observed LFS estimates have been adjusted to ensure that the trend for all reasons agrees with that observed in national inflow data.

Source: Eurostat Labour Force Survey ad-hoc immigrant module.

We therefore look at the distribution of high-skilled jobs held by migrants, by reason for migration. A look at this (Figure 11.8a) shows that persons recruited from abroad (excluding intracorporate transfers) tend to be overrepresented among physical, mathematical and engineering science professionals as well as life science and health professionals and associate professionals. On the other hand, they are under-represented among other associate professionals, which include occupations such as business, legal and social science associate professionals, archivists and librarians, writer and other creative associate professionals and religious associate professionals. As expected, corporate managers are strongly overrepresented among intra-corporate transfers.

Figure 11.8a. Distribution of highly skilled occupations, by reason for migration, recent immigrants and native-born persons having completed their education over the previous ten years, 2008



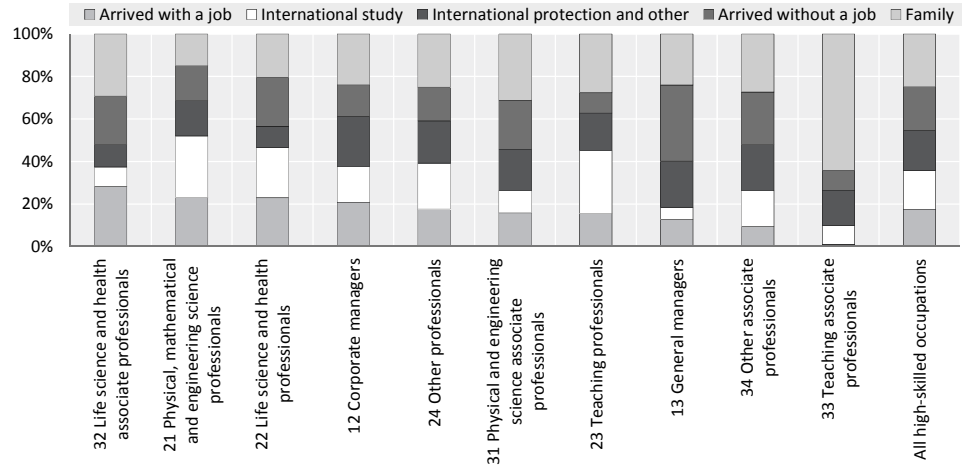
Source: Eurostat Labour Force Survey ad-hoc immigrant module and OECD standardised immigration.

Overall, however, the differences in the occupational distribution between migrants recruited from abroad and those recruited from within the country are not that large. Indeed it would take a reallocation of about 25% of labour migrants recruited from within the country and 20% of family migrants to make their occupational distributions coincide with that of persons recruited from abroad. Thus, at least at this level (two-digit occupation, which refers to the two-digit version of the International Standard Classification of Occupations), which is admittedly a crude one, the jobs for which immigrants were recruited directly by employers from abroad do not appear to differ substantially from those held by immigrants who found work in high-skilled jobs within the country.

By the same token it would take a reallocation of 26% of migrants recruited from abroad and a mere 11% of family migrants to make their distributions of high-skilled jobs by occupation coincide with that of the native-born who have completed their studies over the previous ten years prior to 2008. Indeed the differences in the distributions compared to that of the native-born is smaller for all groups recruited from within the country than it is for persons recruited from abroad. This does suggest a preference or need for certain occupations when recruiting from abroad, but one cannot say that differences are large compared to those recruited from within the country.

In addition, the percentage of high-skilled jobs held by migrants recruited from abroad is a relatively small fraction of all immigrants recruited into such jobs (Figure 11.8b) and this, for all high-skilled occupations (at the two-digit ISCO level).

Figure 11.8b. Distribution of immigrants in high-skilled occupations, by reasons for migrating (excluding intracorporate transfers), EU countries, recent immigrants, 2008



Source: Eurostat Labour Force Survey ad-hoc immigrant module and OECD standardised immigration.

Finally, there does not seem to be much evolution by years of presence in the country in the percentage of persons holding high-skilled jobs, with a few exceptions (Figure 11.9). There is naturally a large increase for persons in the country for study, but only two other groups show progression, namely persons moving for employment and arriving with a prior job in NWE and family formation migrants in SE. All other groups show scarcely any progress over time in the percentage of immigrants holding high-skilled jobs. Because many migrants do not stay on, however, it is difficult to decide whether this is a phenomenon associated with persons who stay on or reflects the effect of persons who have left and who may have held high-skilled jobs to a greater or lesser extent than those who stayed on.

Figure 11.9a. Percentage of persons in high-skilled jobs by reason for migration and years of residence (three-year moving averages), Northern and Western Europe, 2008

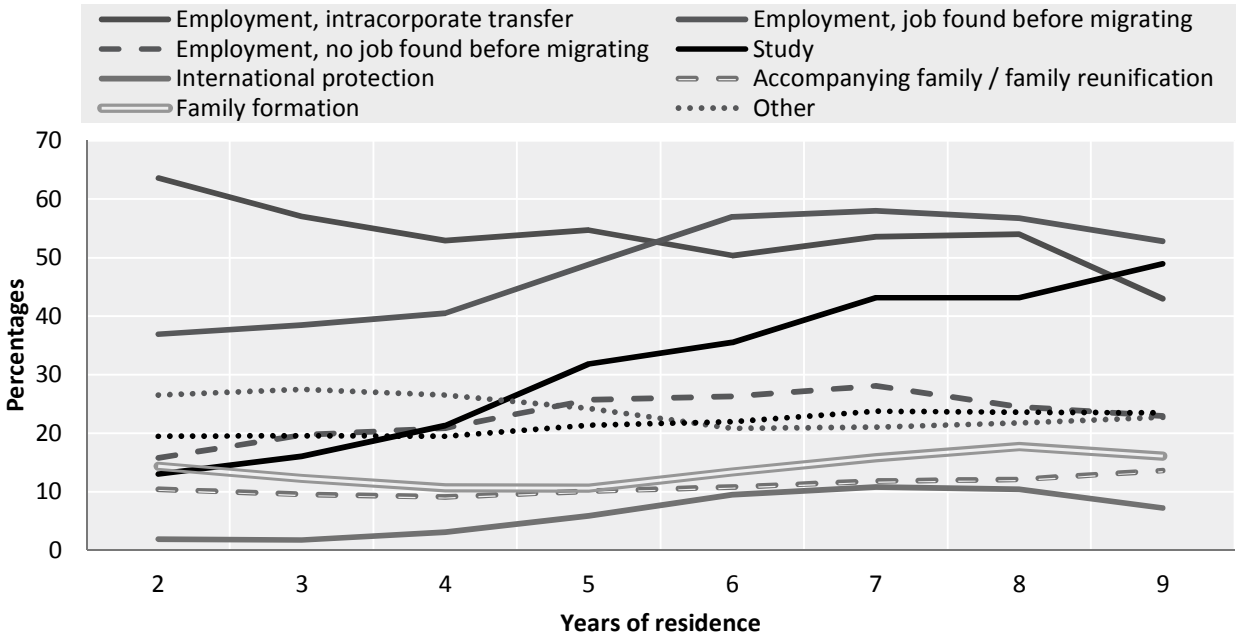
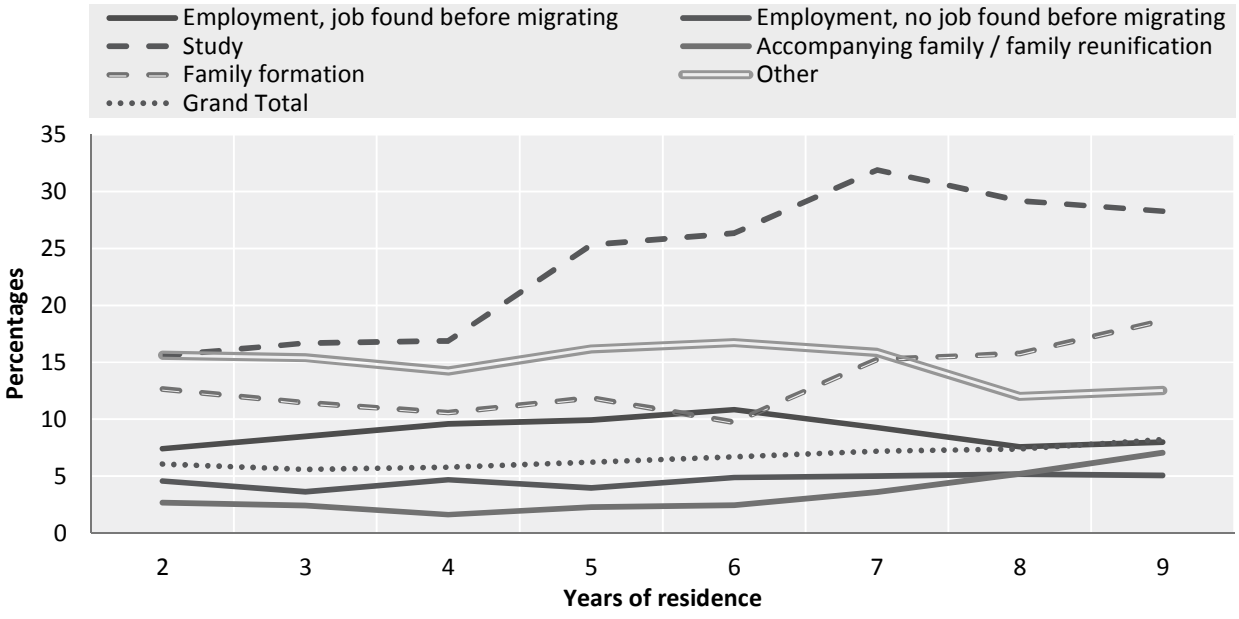


Figure 11.9b. Percentage of persons in high-skilled jobs by reason for migration and years of residence (three-year moving averages), Southern Europe, 2008



Source: Eurostat Labour Force Survey ad-hoc immigrant module and OECD standardised immigration.

11.8. Job-changing among recent international migrants

Many high-skilled labour migrants are in principle hired to fill specific labour needs that cannot be met in the domestic labour market. This may suggest that there is a tighter labour market in these occupations than in others and that immigrant workers may be able to look for and find different employment with better wages and working conditions after arrival, provided their work permit allows them to change employers. On the other hand, employers who have recruited them from abroad have an incentive to keep them, if for no other reason than to recoup the cost of their recruitment. What do the data show in practice with respect to job stability/permanence, by persons who stay on in the destination country?

In Southern Europe, some 60% of employed immigrants, five years after arrival, are still in the same job for which they were recruited or which they found soon after arrival (Figure 11.10). By contrast only 25% of employed native-born workers who completed their studies in the previous ten years are still in the same job they found in the year following the completion of studies.

The situation in Northern and Western Europe is rather different. First 35% of the native-born are in the same jobs five years after completion of their studies. Half of those arriving with jobs and still employed are in the same job as at arrival after five years, but only about 30% of those arriving without jobs have the same employment as the they had shortly after arrival. But the situation in Northern and Western Europe masks an underlying difference. When one looks at immigrants in medium- and low-skilled jobs, the same pattern as that observed in Southern Europe emerges, namely some 60% of immigrants are in the same jobs as at or shortly after arrival. Thus, contrary to what one might expect, immigrants in medium- and low-skilled jobs tend to keep the same jobs much more than those in high-skilled jobs.

These results are striking. They reveal much more mobility than one might have expected among labour migrants, especially if these have been recruited in response to specific labour needs. They suggest that the needs may sometimes be ephemeral or that the hiring conditions were such that the migrant could improve his/her situation by looking elsewhere.

Figure 11.10a. Percentage of workers in same job as in the year of arrival or as in the year after completion of studies (native-born), 2008, Southern Europe

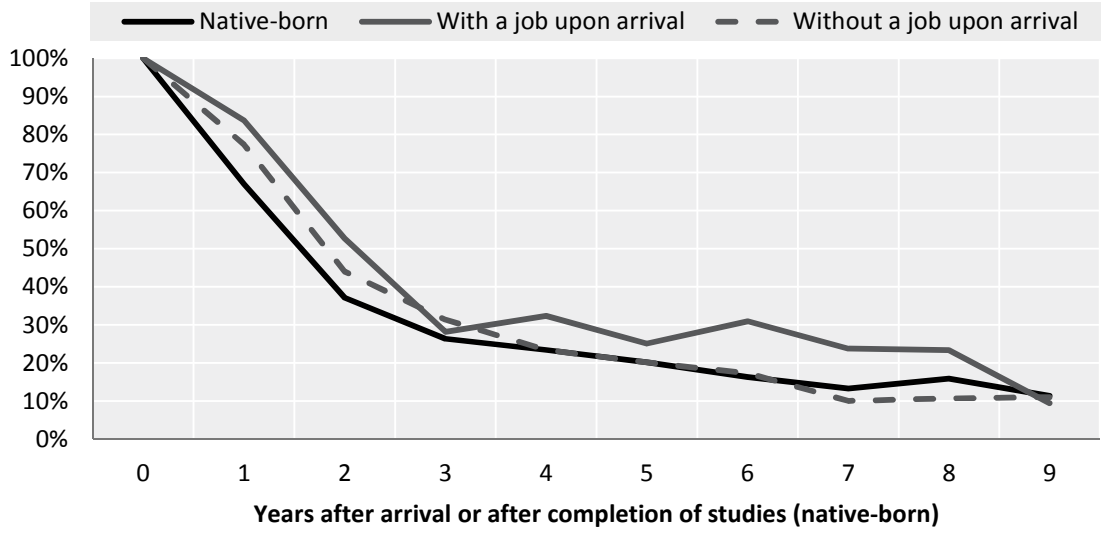
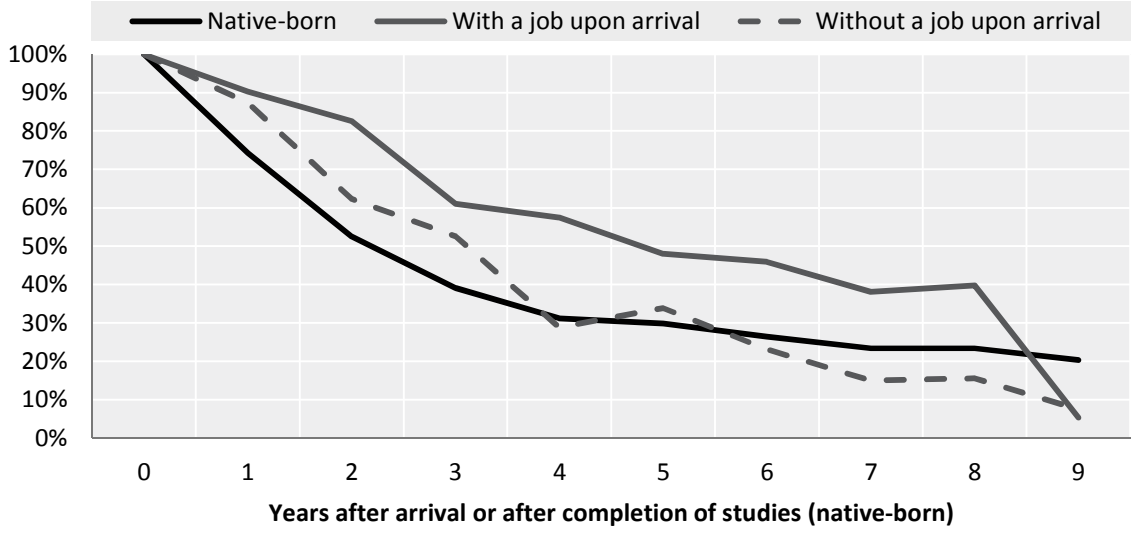


Figure 11.10b. Percentage of workers in same job as in the year of arrival or as in the year after completion of studies (native-born), 2008, Northern and Western Europe



Note: Covers workers 15-50 years of age.

Source: Eurostat Labour Force Survey ad-hoc immigrant module.

11.9. A recapitulation of results from the module

The 2008 immigrant module has been a rich source of information on the characteristics of migrants by reason for migrating and the evolution of their outcomes over time (as proxied by years of residence). It provides quite a number of useful points of reference

which we will recapitulate here. We recall first that these are results that refer to recent immigrants, namely those who arrived in the ten years prior to 2008.

First of all, there is little non-EU labour recruitment from abroad in EU countries, at best 5% of all migration in Northern and Western Europe, plus an additional 4% arriving as intracorporate transfers. In Southern Europe, the percentage of non-EU migrants who are recruited from abroad is about 10%. There is an additional group of self-declared labour migrants, namely those arriving without a job, who are several times more numerous than those recruited from abroad and are especially numerous in Southern Europe, where there have been high levels of unauthorised migration. The exact composition of this group is uncertain; it may consist in part of irregular migrants, former irregular immigrants who were regularised or even of persons who arrived in the country on another status (e.g. tourism, family visit), searched for and found work and stayed on.

The module confirms the far more favourable labour market outcomes of labour migrants, in terms of employment rates, compared to family and humanitarian migrants, whether they were transferred from abroad, arrived with a job or arrived without one. Those arriving without a job have employment rates which are somewhat lower than those arriving with, but there is a tendency for these to converge over time. International students who stay on and enter the labour market after study completion eventually reach employment rates comparable to those of labour migrants. Family and humanitarian migrants, on the other hand, have much lower employment rates which, even after ten years, remain some 15-20 percentage points below those of labour migrants.

One point distinguishes labour migrants recruited in the country from those transferred or recruited from abroad and that is their higher rates of overqualification, which in Northern and Western Europe are about midway between those of other labour migrants and family and humanitarian migrants. Family and humanitarian migrants have very high overqualification rates in general and the situation hardly improves with years of residence in the country. The rates of non-EU labour migrants in Northern and Western Europe actually deteriorate with years of residence, which suggest that job changes for this group are not necessarily towards better employment. International students, as one might expect, show significant progress in employment rates, as they move from student jobs into the regular labour market.

Labour migration is the source of a minority of recent immigrants in employment in Northern and Western Europe and this is as true of immigrants in highly skilled jobs as it is of those in low- and medium-skilled jobs. Persons arriving for international protection and for study each account for some 20-25% of recent immigrants in high-skilled jobs. However, the "yield" of persons in high-skilled jobs and its evolution over time differs considerably across reasons for migration. The only immigrants showing a high yield are those coming for work or study and those showing a significant improvement over time are those arriving for study as well as those who arrived with a job (in NWE). Persons arriving for other reasons show low percentages of persons in high-skilled jobs and little improvement with years of residence.

There do not appear to be large differences in the distribution of high-skilled occupations between persons recruited from abroad and other types of migrants. In other words, at the level at which one is measuring occupations here (two-digit ISCO), there is no strong skill specificity between migrants recruited from abroad and other types of migrants. The two observations one can make is that intracorporate transfers are more often corporate managers than other types of migrants and that persons recruited from abroad and persons who arrived for study are somewhat more often in STEM (Science, Technology,

Engineering and Math) and life science professional occupations and less often in social science-type professional occupations than those recruited in the country. In addition, for all high-skilled occupations without exception (two-digit ISCO level), there are far more recent immigrants recruited in the country into these occupations than from abroad.

In Southern Europe, 60% of labour migrants still present in the country, both those recruited from abroad and from within the country, are in the same job as when they were initially recruited some five years after arrival. This is in sharp contrast to native-born persons completing their studies, only about 25% of whom are in the same jobs they obtained after completing their studies five years before. In Northern and Western Europe, the situation is different. Among persons arriving without jobs and still present in the country and the native-born who have completed their studies, 35% are in the same jobs five years later; for persons arriving with jobs, it is 50%. If one looks at persons in low- and medium-skilled jobs, on the other hand, one observes the same result as for Southern Europe, namely some 60% of workers are in the same jobs as when they arrived five years before.

Finally retention rates after about 8-10 years of EU and non-EU labour and study migrants in Northern and Western Europe are from 30 to 40%, while those arriving for other reasons show retention rates between 55 and 60%.

11.10. Policy implications

Before we begin addressing these, there are a number of issues worth considering more closely.

With few exceptions, European countries have generally preferred an employer-driven approach to recruitment of immigrant workers from third countries, incorporating either facilitated procedures for occupations deemed to be in shortage or a test of the labour market in other cases. This ensures that immigrants arrive with a job and are active participants in the economy upon arrival. However, it does rely on the initiative of employers to recruit workers. In practice, as we have seen, recruitment of workers within the country outnumber those recruited from abroad both because many family and humanitarian migrants enter the labour market but also because there is a certain level of unauthorised migration in every country and many if not all persons in this situation manage to find jobs and to eventually become regularised.

Now one generally assumes that most employers will recruit from abroad if they need to maintain or expand their level of activity and cannot find employers in the domestic labour market. Expansion, however, may be optional for an enterprise and in the absence of needed workers or of workers with the right skills, employers could decide not to expand or to postpone hiring decisions. Indeed in employer surveys in both France and Germany, only a minority of employers (about 20%) indicated they expected to be hiring from abroad in the face of higher vacancies or recruitment difficulties.

Recruitment from abroad may not be the only option open to employers; they may be able to increase working hours of existing employees, subcontract, resort to technological solutions, delocalise, or train existing employees or new hires, although not all of these may be possible or affordable, especially for small businesses.[6]

The recruitment option also presupposes that employers have the contacts, the means and the knowledge to recruit from abroad. The hiring experience of most employers, however, is with candidates on the domestic labour market, most of whom have domestic qualifications and working experience and who, even if they do not, can be directly

interviewed.[7] Few employers will hire a candidate for employment sight unseen, or without some recommendation, whether this be from existing employees, employment agencies or other intermediaries.

In short, the existence of labour shortages does always imply that employers will recruit or attempt to recruit immigrant workers from abroad. The issue then is whether governments have an interest in ensuring that more foreign recruitment occurs and if so, what policies and incentives need to put in place which will induce more employers to do so. Why should governments act if market-based decisions by employers imply a decline in the size of the work force? One reason is that employer decisions do not necessarily take account of possible externalities, such as the effects on the broader economy of reduced hiring by employers. The key question then is whether a demand-driven international migration system alone will result in enough recruitment from abroad to fuel economic growth.

Current explanations for the low level of labour migration in Northern and Western Europe centre on two reasons, namely that Europe is not an attractive destination for highly skilled migrants or that demand is not yet strong enough for employers to have begun significant recruitment efforts. The first of these reasons contrasts the situation of Europe with that of the settlement countries (Australia, Canada and New Zealand) and the United States.

The argument of attractiveness, however, implies that employers are currently making substantial efforts to recruit from abroad and are not receiving any or enough applications. But there is no evidence that this is indeed the case. In addition, the mode of recruitment in the settlement countries is different. Historically, the Australian, Canadian and New Zealand permanent migration systems have been so-called "supply-driven" ones which have not required a job offer. If European countries were to put in place migration regimes of the kind which these countries have had, that is, in which each year it is announced that a certain number of international migrants will be admitted, that they will be selected on the basis of certain specified characteristics, that they need not have a job in order to be selected, that those selected will be admitted with their families with the right of permanent residence and that nationality for those admitted can be acquired within a relatively short period, it is difficult to believe that there would be a shortage of candidates.

There are two qualifications which one needs to make with regard to this statement, however, namely that the settlement countries have a widely spoken international language and have little trouble finding candidates who speak the language, although it is not always an absolute requirement if candidates have enough other favourable characteristics to amass the threshold number of points required for acceptance. In addition, the outcomes of *persons arriving without jobs* in these countries have deteriorated in parallel with the shift of origin countries from largely European ones to countries from outside the OECD area. As a result, all of these countries have strengthened their selection criteria, giving additional points for job offers while increasing possibilities for temporary labour migration and study and, as well, favouring transitions from temporary to permanent status.

Secondly, the comparison with the United States is not necessarily an accurate one, because the United States is perhaps one of the most restrictive country in the OECD with regard to permanent migration channels for highly skilled migrants. It allocates about 70 000 permanent migration spots per year to highly skilled migrants which, on a per capita basis, amounts to fewer permanent-type labour migrants than admits, for example, France. At the same time, however, its principal temporary high-skilled migration channel (essentially the H1B stream, with some 85 000 allocated spots per year, not counting those

for employment by universities and non-profit institutions, which are uncapped) tends to be strongly oversubscribed with spots taken up within a week of the beginning of the fiscal year. During the Great Recession, the take-up period lengthened to about seven months and during the economic recovery of 2002 and 2003, less than 120 000 of the 195 000 allocated spots for those years were actually taken up. In short, even in the United States, demand is not unlimited and failure to exhaust allotments or to reach high level of labour inflows does not necessarily reflect low attractiveness.

If the low level of labour migration in Europe does not then reflect a problem of attractiveness, can it be then that labour needs are not yet strong enough for employers to look beyond their own borders for prospects? There is evidence in a number of countries, however, of growing vacancies in a number of occupations, which are remaining unfilled (OECD, 2007). Even as liberal a migration regime as the new Swedish one has not resulted in a large increase of recruitment from abroad. A review of the situation for Sweden revealed that most recruitment from abroad was by multinationals or other businesses with prior contacts (ethnic businesses) and that recruitment by small and medium enterprises, which comprise the bulk of employment, was limited (OECD, 2007). The conclusion was that many enterprises had little experience with recruitment from abroad and may need assistance in filling labour requirements in this way.

Language may also be an issue. Multinationals often have English as the language of work, and ethnic businesses may require familiarity more with the language of the country of origin than with that of the destination country. In any event, evidence from Sweden suggests that most of the jobs recruited for by ethnic businesses are not generally highly skilled in nature (Pälermo et al., 2012).

It is difficult to imagine that employer language requirements will drop entirely in the face of stronger levels of labour needs. At best, proficiency requirements may weaken somewhat, but language will likely remain a significant obstacle to recruitment in many countries.

It is difficult to provide a definitive answer to whether or not it is insufficient demand, perhaps as a result of the economic crisis, which explains the continuing low levels of skilled labour migration in Europe. It is a question which we will put aside for now, while drawing on the empirical evidence accumulated from the 2008 LFS immigrant module.

The overall conclusions one can draw from these results is that with respect to high-skilled migration, the emphasis which most EU countries in Northern and Western Europe have put on off-shore recruitment and on finishing international students is the right one from the point of view of outcomes. But that retention of migrants in these categories is a significant problem. In addition, it is not certain that these categories of migration will yield enough in the way of volume and that there may be room for encouraging on-shore recruitment.

The results have shown that labour migrants hired from within the country have high employment rates compared to family and humanitarian migrants; in addition, their overqualification rates, although higher than those for off shore recruits, are nonetheless significantly lower than those of family and humanitarian migrants. The one complicating factor about results for this group is that one does not have a very clear idea of its composition. It may include many former or current unauthorised migrants and one would like to be able to draw conclusions regarding legal arrivals who have been hired from within the country, for example, as tourists.

The picture for family and humanitarian migrants remains a depressing one: low employment and high overqualification rates at arrival and shortly thereafter, some progress in employment rates but not enough and little improvement with regard to overqualification. One area where information is lacking is whether the subgroup of family members of favourable recruits (either labour or study) also have good outcomes. If so, then outcomes for family migrants will improve with the increase in the migration of labour migrants recruited from abroad and of study migrants.

The policy implications outlined below are preliminary in nature and focus on third country migration to the European Union. They are discussing the possibility to encourage the retention of successful labour migrants and to increase the volume of highly skilled migration.

11.11. Increasing retention

We address first of all the issue of retention, where we have seen that migrants with favourable outcomes are less likely to stay on than migrants arriving for other reasons.

Results (published in OECD, 2013) indicate that for Europe, relatively few migrants seem to arrive with their families. This was already suggested by the OECD's standardised migration statistics, which showed low levels of accompanying family migration in those European countries where one could measure this, compared to that observed in the settlement countries of Australia, Canada and New Zealand. One would expect accompanying family migration to be more common for highly educated migrants, but it is not clear that this is occurring in Europe; further family migration analysis at the OECD will examine this question more closely, among others.

Although there is admittedly as yet no data to confirm this, it would appear that migrants arriving as a family are more likely to stay on than labour migrants who arrive alone and then assess after arrival the desirability of bringing in their families. In addition, it has been shown that educational assessment results for children of immigrants are better the earlier they arrive in the destination country (OECD, 2012). This would argue in favour of accompanying family migration rather than later family reunification.

On the other hand, low accompanying family migration levels in Europe may be due to the fact that demand-driven systems generally have a shorter interval between acceptance and arrival and the later arrival of family members may simply reflect the time it takes to organise a move, with the worker arriving first and the family later, compared to situations where there is no job offer and there is no time constraint on the arrival of the worker.

In addition to the differences in the method of selection of highly skilled labour migrants by European countries versus settlement countries, there exists one major difference in the conditions of stay, namely the duration of the permit granted upon entry, which is permanent for the settlement countries with fairly rapid access to nationality, but generally corresponds to the duration of the employment contract in European countries.

This is worthy of note, because the message conveyed to migrants and their families in these two cases is clearly very different.

In the settlement countries, the message is that migrants are expected to settle for good and that their residence status does not depend on the vagaries of the labour market and their employment status. In European countries, the message is that labour migrants can stay provided they continue to hold a job, although there is admittedly some flexibility accorded in the event migrants do lose their jobs. The right of permanent residence is

obtained only after immigrants have, in a sense, proven themselves. Under these conditions, migrants may well decide to condition the migration of their family members on an assessment of the long-term prospects in the destination country in the years following arrival.

Although it seems likely that the right of permanent residence upon arrival can encourage families to arrive as a unit and their subsequent retention in the destination country, it is difficult to reconcile this right with a migration system in which a job offer is the principal requirement of entry. The reason is that it grants employers a very strong bargaining chip in the negotiation of wages and working conditions with candidates for migration. In settlement countries, the offer of a job grants applicants additional points, but the applicant must acquire most of his/her points on the basis of other characteristics (age, educational attainment, occupation, resources, etc.). The introduction of the right of permanent residence at entry in a demand-driven system would require a strong verification of wages and working conditions to ensure that they correspond to domestic standards and to avoid possible abuses.

The alternative would be a supply-driven system as exists in the settlement countries, however, more and more, places in such systems are going to persons already in the country on a temporary status or to persons who have prior job offers. In addition, the experience of the settlement countries in recent decades would argue against a system in which immigrants, even highly qualified ones, would be admitted without job offers, at least not without some strong selection criteria.[8] The wages of jobs obtained after arrival of immigrants arriving without jobs are much lower than was the case in the past in Canada, for example, and the percentage of immigrants living in poverty has risen considerably. The one saving grace is that educational outcomes of the children of immigrants continue to be highly favourable, despite the declining labour market outcomes of their parents compared to the past.

In the European countries where supply-driven programmes with no job offer requirement have been attempted in recent years, namely Tier 1 in the United Kingdom and the Danish "green card", the outcomes have not been especially good.

11.12. Increasing the volume of highly skilled migration

This section will address means to increase the volume of highly skilled migration. The section is based in part on the supposition that employers themselves will not necessarily be recruiting sufficiently from abroad by themselves and that the hiring experience of most employers is with job-seekers present in the domestic labour market. We will not be addressing the case of intracorporate transfers in what follows, because multinationals already have a privileged access to a foreign work force, compared to small and medium enterprises with a purely domestic presence.

Shortage lists and labour market tests

The first element to consider concerns restrictions on high-skilled occupations for which recruitment is allowed. The assumption is that these restrictions may in practice be limiting recruitment by some employers. In many countries, there are lists of occupations in shortage, which are used to limit recruitment or to facilitate procedures for recruitment in such occupations. But recruitment is not always restricted entirely to occupations on these lists; jobs in other occupations for which employers wish to recruit from abroad are subject to a labour market test, which may be more or less restrictive, and which involves some attestation or demonstration that domestic or European candidates are not available or

likely to be harmed by a foreign recruitment. In practice, however, the shortage lists appear to play a rather limited role. In the United Kingdom, which probably has the most extensive system for identifying occupations in shortage, only about 15% of work permits granted in 2011 were for occupations on the shortage list; in Denmark it was about 5%. The rest were for jobs in occupations subject to a labour market test (United Kingdom) or exceeding a wage threshold (Denmark).

In addition, for every high-skilled occupation (at the two-digit ISCO level) there were far more high-skilled jobs filled by migrants entering EU countries for other reasons than by migrants recruited into employment from abroad (Figure 11.8b). Finally, over 50% of labour migrants recruited from abroad and still present in the countries of destination were not in the same jobs as those for which they were hired five years after arrival (Figure 11.10). The notion that one is ensuring protection for the domestic labour market by limiting recruitment to occupations on a shortage list or subject to a labour market test would thus appear to be something of a polite fiction, at least when labour needs are measured at the occupational level cited here. What is the rational to restrict labour migration to certain occupations when migrants entering under other modalities are free to enter the labour market without any restrictions whatsoever and indeed, do so in large numbers?

It may be that shortages are more sensibly described at a detailed occupational level, but the limited resolution of data systems, on the one hand, and the ability of employers to adapt job descriptions, on the other, mean that an accurate identification of labour shortages that reflects the reality of the labour market and yields enforceable criteria for restricting recruitment may well be beyond reach.

A better protection for domestic workers would likely be ensured by requiring (and verifying) that wages and working conditions are according to domestic standards, as is (or should be) the case for persons recruited from within the country. How this in practice would be done remains to be determined. In Sweden, job offers are verified by unions, who can express a non-binding opinion on the wages and working conditions specified. No verification of the actual signed contract is carried out, however, so that there is no guarantee that the actual wages and working conditions correspond to those in the job offer. But a verification can be carried out at the time of work permit renewal, and sanctions can be made sufficiently onerous in the case of abuse to be dissuasive. In any event, highly educated workers are generally better placed to defend their rights than are less educated ones, so that a permit which allows workers to change jobs would help to limit abuse.

Controlling numbers

If the granting of skilled work permits is not made conditional on apparent labour market needs, what guarantee is there that employers will not recruit preferentially from abroad rather than hiring in the domestic market and that numbers will not explode?

As noted earlier, where shortage lists exist, recruitment is sometimes nonetheless allowed for occupations not on the shortage list which are then subject to a labour market test. In all countries without exception, however, the number of rejected requests for work permits is a fraction of the total number of work permits requested (OECD, 2007), with "labour market needs" being only one of the possible reasons for rejection. In other words, the number of requests is not substantially larger than the number of permits granted. Perhaps it is the labour market test requirement which discourages applications and numbers would be far higher without it. The Swedish labour migration regime, for which essentially the sole condition for recruitment is that the job offer should respect standard

Swedish wages and working conditions, illustrates that recruitment from abroad does not necessarily expand greatly when subject to these conditions.

The US H1B visa is another particularly instructive example, which although more bureaucratic, is similar in certain ways to the Swedish system, but restricted to highly skilled jobs. The first step in acquiring this visa is for the employer to obtain a labour certification for the position to be recruited for. In order to receive this, the employer must agree to the following:

1. *Wages*: to pay non-immigrants at least the local prevailing wage or the employer's actual wage, whichever is higher, and pay for non-productive time. Offer non-immigrants benefits on the same basis as offered to US workers.
2. *Working conditions*: to provide working conditions for non-immigrants which will not adversely affect the working conditions of workers similarly employed.
3. *Strike, lockout, or work stoppage*: to confirm that there is no strike, lockout, or work stoppage in the named occupation at the place of employment.
4. *Notice*: to affirm that notice to union or to workers has been or will be provided in the named occupation at the place of employment. A copy of this form will be provided to each non-immigrant worker employed pursuant to the application.

In practice, these conditions are in fact fairly similar to the Swedish requirement on wages and working conditions and includes the requirement of a notice to a union or to workers at the workplace. In practice, In recent years, there have been six to eight times more positions certified than they were H1B visas available, which would suggest a large potential for high-skilled immigration were the cap of 85 000 to be lifted. Indeed prior to the Great Recession, all visas were taken up within a week of their being made available. In recent years, however, despite the high number of certifications, it has taken several months (up to seven in 2011) for all visas to be taken up. Employers asking for labour certification thus do not seem to be following up systematically with a formal recruitment request, otherwise the visas would never last for as long as seven months. They seem to be using the certification procedure as just-in-case insurance. As noted earlier, in the early part of the 2000-10 decade when the numerical limit was much higher (195 000), this limit was never attained. H1Bs granted reached 161 000/118 000/107 000 visas, respectively, in the three years (2001-03) when the cap was at this level.

In short even under what would appear to be rather liberal migration conditions and a flexible labour market perceived as attractive by potential immigrants, demand is not unlimited when employers have to respect local wages and working conditions. Some verification of wages and working conditions is undoubtedly still necessary, however, to ensure that employers are honouring their stated commitments.

Finally, if the notion of labour market needs seems to be of questionable value as a criterion for limiting labour migration numbers when no such criterion applies to migrants who enter under other categories and who are a more important supply of highly skilled migrants, it nonetheless may have value in reassuring public opinion that labour migration movements are being regulated and under control.

International students

As we have seen, international students constitute a category of migration which attains relatively high employment rates and low overqualification rates following entry into the labour market after completion of studies. Most countries have already introduced measures

to facilitate job search by international students. Those finding jobs, which generally have to be in an occupation compatible with their field of study, can stay. Retention rates by this group of migrants are estimated to be about 37% after eight to ten years after arrival in Northern and Western Europe. The objective should be to increase this and for this, a further relaxing of the rules for stay should be envisaged.

Note first that overqualification and mismatches between fields of study and occupation are not uncommon even among persons born and entirely educated in the country. Thus for international students with domestic degrees, some flexibility could be allowed here, with no absolute necessity to find work in a field commensurate with their qualifications.

One handicap may be that many international students may be enrolled in English-language programmes, which do not prepare them for entry into the national labour market, except in workplaces where English is the language of work. They will undoubtedly pick up some rudiments of the language by virtue of their presence in the country, but this may not be enough to enable them to work at their level of competence in their chosen field.

Here there a number of policy interventions which might be envisaged? The policy of the Czech Republic of introducing tuition fees for English-language programmes but giving national treatment (US no or low tuition fees) to students studying in the national language is one possibility. The recent Danish experience with the introduction of tuition fees for international students suggests that falls in enrolment as a result of this are only temporary; in Denmark international student enrolment had returned to this previous level within two years.

Studying in the national language presupposes some knowledge of the language, which in many cases may not exist prior to enrolment. Governments would need to subsidise language learning by international students before their formal entry into tertiary education, as is done currently in the Czech Republic and Japan. Learning many of the European national languages, which are scarcely spoken outside their borders, represents a significant human capital investment for international students, so some significant incentives need to be introduced to induce students to go this route. Low or no tuition fees mentioned above are one possibility. The right of permanent residence for international students whose language proficiency exceeds a certain threshold is another. An international student with a national degree and a good command of the national language and undoubtedly some knowledge of the national labour market and work practices as a result of student jobs – there could hardly be a more ideal candidate for permanent migration and there seems little reason not to offer the major incentive which the right of permanent residence constitutes, without any other additional requirement, to persons in this situation.

In-country recruitment

We have seen earlier that labour migrants arriving without jobs tend to have high employment rates and overqualification rates which, although higher than those of other labour migrants, are substantially lower than those of immigrants arriving for other reasons. We have also seen that recruitment from abroad tends to be relatively uncommon and that most immigrants hired into high-skilled positions are recruited within the country.

These results argue in favour of encouraging in-country recruitment of highly educated persons present in the country for reasons other than international study, such as temporary work, exchange programmes, tourism or business visits, etc. In-country recruitment also addresses the problem that for most employers, the only recruitment they know of is that on the domestic labour market, where they can directly interview prospective candidates.

To avoid that numbers go out of control some restrictions are necessary. It might be sensible for example to apply criteria similar to those cited above for finishing international students. Job-seekers who find a job commensurate with their qualifications could obtain the right to stay. Generally one would expect employers would prefer a domestic candidate with domestic qualifications, language proficiency and knowledge of work practices and procedures, so that the hiring of an immigrant candidate should in principle reflect a real need.

For many European countries, finding candidates with adequate language capabilities is going to be a significant problem, so some strong incentives need to be introduced to develop a pool of candidates with the necessary language proficiency. Highly educated persons should be encourage to take language courses while in the country, with clear outcomes (see below) for those attaining minimum levels of proficiency, which should be high enough to make them interesting prospects for employers. These language courses should be publicly funded with candidates encouraged to learn the rudiments of the language before arrival to speed up post-arrival language learning.

Persons attaining a high level of proficiency could be granted the right of permanent residence without any other qualification. For persons with lower levels of proficiency, stay could be conditioned on finding a job within a reasonable time-frame, with the job not necessarily corresponding to their nominal level of educational qualification. Parallel training by prospective employers might be useful in preparing candidates for eventual jobs. As a stay incentive, easy access to permanent residence over a short time-frame could be envisaged.

11.13. Conclusion

The 2008 ad-hoc immigrant module of the European Union Labour Force Survey has turned out to be an invaluable data source for information about labour migration. It has shown, among others, that only a small fraction of migrants are actually recruited as labour migrants from abroad; that far more high-skilled jobs are filled by migrants recruited in the country than those recruited from abroad and this is true for every high-skilled occupation without exception; that retention rates for immigrants having the most favourable labour market outcomes tend to stay less; and that half of highly skilled labour migrants are no longer in the same jobs for which they were initially recruited after five years.

These results have a number of implications with regard to recruitment of the highly qualified. They suggest, first of all, that shortage lists and labour market tests may not be terribly relevant as tools for regulating flows according to needs, essentially because there are far more immigrants entering employment in all highly skilled occupations through other modalities of entry. Protection of domestic workers may best be ensured by seeing to it that wages and workers conditions of first immigrant jobs are according to domestic standards. Current migration regimes in a number of countries suggest that with these requirements, demand for highly skilled migrants will likely be largely self-regulating.

Ensuring greater retention, encouraging migrants to come with their families and inducing potential candidates to learn national languages will require much more significant incentives than are currently offered. For this the right of permanent residence upon entry seems a likely candidate. But its granting should not be indiscriminate. The most likely candidates would consist of immigrants recruited into a high-skilled job, international students completing their studies in the country with a good level of language proficiency and highly educated persons who have acquired a high level of language proficiency. More

generally, the ability to obtain good employment and to demonstrate language proficiency needs to be rewarded far more than is currently the case in most countries.

It seems likely that the low levels of highly skilled labour migration in many European countries have less to do with low attractiveness than with the fact that employers are not recruiting significantly from abroad. Indeed, the lack of suitable candidates for jobs may lead employers to adopt other strategies rather than to attempt to recruit from abroad, especially if they have little experience with this. This may lead to a situation in which recruitment may be suboptimal for the economy as a whole. Governments will need to foster more recruitment of persons already in the country for other reason whether this be international study, temporary work, exchange programmes or even may be tourism and business visits.

Notes

1. In some countries, the labour force survey sample is drawn from the population register and entry into the register is conditional on holding a valid permit. In these countries, the labour force survey sample would not in principle contain unauthorised migrants.

2. The countries covered are Austria, Belgium, Cyprus (see note 3 below), Germany, Spain, France, Greece, Ireland, Italy, Lithuania, Luxembourg, Portugal, Sweden, United Kingdom.

3. Note by Turkey: The information in this chapter with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

   Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this chapter relates to the area under the effective control of the Government of the Republic of Cyprus.

4. There are a number of coverage differences which might lead one to expect greater differences than are observed. The module data exclude persons under 15 and 75+. In addition Labour Force Survey data are known to underestimate recently arrived immigrants. Finally, the permit data include changes in status, that is, persons who entered the country under a temporary status, such as international students, and switched to permanent status.

5. Were the measurement to take place shortly after arrival, the employment rates would in principle be close to 100%; the measures here represent the employment situation of persons with up to ten years of residence. Many persons employed upon arrival may have lost or left their jobs thereafter; the measurement here is an average over all years of residence up to ten.

6. In the French Labour Needs Survey ("*Enquête Besoins en Main-d'oeuvre*"), 35% of employers said they would train existing employees, 61% that they would train persons hired from outside the firm and 34% that they would postpone hiring.

7. It was striking that there was no significant wage inflation nor other obvious signs of labour shortages prior to EU enlargement in countries (the United Kingdom and Ireland) which saw significant inflows of EU workers following 2004. Yet many workers from the new member states fanned out over the United Kingdom and Ireland and were able to find employment, many in lesser-skilled occupations for which they were overqualified but where they provided a welcome source of productive labour. In other words, hiring occurred when there was a readily available supply of labour in the labour market and employers saw a chance to capitalise on it.

8. Here it would be instructive to know if persons with proficiency in the language of the country but arriving without jobs are having better success than those with little to no proficiency. This seems very likely.

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