

OECD Social, Employment and Migration Working Papers
No. 232

Job polarisation and the middle class: New evidence on the changing relationship between skill levels and household income levels from 18 OECD countries

Andrea Salvatori,

Thomas Manfredi

https://dx.doi.org/10.1787/4bf722db-en

OECD

Organisation for Economic Co-operation and Development

DELSA/ELSA/WD/SEM(2019)11

For Official Use **English - Or. English**

16 July 2019

DIRECTORATE FOR EMPLOYMENT, LABOUR AND SOCIAL AFFAIRS
EMPLOYMENT, LABOUR AND SOCIAL AFFAIRS COMMITTEE

Job polarisation and the middle class

New evidence on the changing relationship between skill levels and household income levels from 18 OECD countries.

JEL classification: J01

Keywords: job polarisation, middle class, living standards.

Authorised for publication by Stefano Scarpetta, Director, Directorate for Employment, Labour and Social Affairs

Andrea Salvatori, andrea.salvatori@oecd.org, +(33-1) 45 24 94 56
Thomas Manfredi, thomas.manfredi@oecd.org, +(33-1) 45 24 85 26

JT03449819

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

OECD SOCIAL, EMPLOYMENT AND MIGRATION WORKING PAPERS

www.oecd.org/els/workingpapers

OECD Working Papers should not be reported as representing the official views of the OECD or of its member countries. The opinions expressed and arguments employed are those of the author(s).

Working Papers describe preliminary results or research in progress by the author(s) and are published to stimulate discussion on a broad range of issues on which the OECD works. Comments on Working Papers are welcomed, and may be sent to els.contact@oecd.org.

This series is designed to make available to a wider readership selected labour market, social policy and migration studies prepared for use within the OECD. Authorship is usually collective, but principal writers are named. The papers are generally available only in their original language – English or French – with a summary in the other.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

© OECD 2019

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for commercial use and translation rights should be submitted to rights@oecd.org.

Acknowledgement

This research was supported by funding from the European Commission. The main findings and results of this work have been published in chapter 3 of OECD (2019), Under Pressure: The Squeezed Middle Class.

We thank Michael Förster, Horacio Levy, Stijn Broecke and colleagues from the OECD Directorate for Education and Skills for their comments.



Abstract

Labour markets across the OECD have polarised in recent decades, as the share of middle-skill occupations has declined relative to that of both high- and low-skill occupations. This paper shows that, contrary to what is often assumed in the public debate, job polarisation has not resulted in a decline in the share of households with middle-income across 18 OECD countries. Most of the changes in the share of middle-income households result instead from changes in the propensity of workers in different occupations to be in it. In fact the results point to a change in the relationship between occupational skill levels and household income as both middle and high skill jobs increasingly fail to deliver on the promise of the relative income status traditionally associated with their skill level. These changes might help explain some of the social frustration that has been at the centre of the political debate in recent years.

Résumé

Les marchés du travail des pays de l'OCDE se sont polarisés au cours des dernières décennies, la part des professions moyennement qualifiées ayant diminué par rapport à celle des professions hautement qualifiées et peu qualifiées. Cet article montre que, contrairement à ce que l'on suppose souvent dans le débat public, la polarisation de l'emploi n'a pas entraîné une baisse de la part des ménages à revenu intermédiaire dans 18 pays de l'OCDE. La plupart des changements dans la part des ménages à revenu moyen résultent plutôt de changements dans la propension des travailleurs de différentes professions à y faire partie. En fait, les résultats indiquent un changement dans la relation entre les niveaux de compétences professionnelles et le revenu du ménage, les emplois à compétences moyennes et élevées ne permettent pas d'obtenir le statut de revenu relatif traditionnellement associée à leur niveau de compétences. Ces changements pourraient aider à expliquer une partie de la frustration sociale au centre du débat politique de ces dernières années.

Table of Contents

OECD SOCIAL, EMPLOYMENT AND MIGRATION WORKING PAPERS 2

Acknowledgement 3

Abstract 4

Résumé 5

1. Introduction 8

2. The polarisation of the labour market and the distribution of working individuals across household income classes 10

2.1. The polarisation of the occupational structure is widespread and has mostly resulted in a net shift of employment to high-skill occupations 12
2.2. Polarisation of household income classes is not as widespread and has mostly resulted in a net shift of working adults to the lower class 12
2.3. How job polarisation has impacted the middle class 14
2.4. The middle class has become much less middle skill and much more high skill 20
2.5. Changes in the propensity of different occupations to be in the middle-income class 22

3. How changes in the number of working adults and in the occupational mixes within households have affected the income classes 29

3.1. Changes in the share of working households in the middle class vary across countries 30
3.2. In most countries, the number of single-adult households and dual-earner couples has increased relative to that of single-earner couples 30
3.3. The growth of single-adult households and dual-earner couples has had a limited impact on the size of the middle class 31
3.4. There are more single adults and fewer single-earner couples in the middle class 34
3.5. Changes in the propensity to be in the middle class for different types of households 35
3.6. The role of occupational mixes in dual earner households 38

4. Conclusions 43

References 44

Figures

Figure 2.1. Job polarisation across OECD countries, mid-1990s to mid-2010s 12
Figure 2.2. Change in the size of the middle class, mid-1990s/mid-2010s 13
Figure 2.3. The contribution of each skill group to changes in the size of the middle class 16
Figure 2.4. The impact of job polarisation on class sizes 18
Figure 2.5. The middle class is becoming more high skill and less middle skill 21
Figure 2.6. Changes in the probability that a skill group belongs to a given income class 24
Figure 2.7. Changes in the probability that a certain skill group belong to a certain income class, before and after the recession 27
Figure 3.1. Changes in the size of the three classes using household shares 31
Figure 3.2. Changes in the aggregate shares of Dual-earner couples, Single-earner couples, and Single Adult 31
Figure 3.3. Decomposition of changes in the middle class as a share of households 33
Figure 3.4 There are more single adults and fewer single-earner couples in the middle class 35
Figure 3.5. Changes in the distribution of households across classes 37
Figure 3.6. Dual-earner couples with at least one high-skill worker have fared relatively better 41
Figure 3.7. Changes in the distribution across classes of households with a secondary earner of a given skill level 42

Boxes

Box 2.1. Measuring the impact of job polarisation and household working characteristics on the middle-income class. 11

1. Introduction

1. The polarisation of the occupational structure across OECD countries is a well-documented phenomenon (OECD, 2017[1]). Much attention has been given to its causes, with the bulk of the literature pointing to technology and (to a less extent) trade as the main drivers of the decline in the share of middle-skill occupations. Less is known on its consequences for workers' living standards.

2. In the policy debate and the press (Elliot, 2017[2]; Yglesias, 2014[3]) it is often assumed that the decline in the share of middle-skill jobs is associated with a decline in the fraction of middle-income households. However, there is currently no comparative evidence on how job polarisation has affected households in different income groups. This paper provides original evidence on this issue using data from across 18 countries between the mid-1990s and the mid-2010s. The evidence provides new important insights to inform the debate on the changing fortunes of the middle-class which has taken the centre-stage in the policy debate in a number of countries.[1]

3. Because many workers in middle-income households hold middle-skill jobs, it is reasonable to expect that job polarisation might have exerted a negative pressure on the proportion of households with a medium total income (Vaughan-Whitehead, Vazquez-Alvarez and Maître, 2016[4]). However, other changes might have counteracted (or reinforced) the negative pressure arising from the decline of the middle-skill occupations.

4. First, the growth of higher-skill occupations that has compensated the decline in middle-skill occupations in most countries might have sustained the growth of the share of middle-income households, since many of the workers in these occupations also belong to middle-income households. Second, the probability of workers in different occupations to be in a middle-income household might have changed over time as a result of changes in any of the factors that affect the total disposable income of the household, including the tax and benefit system, labour or non-labour incomes for any individual in the household, and partner's occupations. For example, Vaughan-Whitehead et al. (2016[4]) argue that, in some European countries, occupations that traditionally represented the middle class, such as teachers and doctors, may not systematically belong to the middle-income groups anymore.

5. This paper provides novel descriptive evidence on both of these issues documenting (a) how job polarisation has affected the share of middle-income households and (b) how the probability of being in the middle-income group has changed over time for workers and households of different skill levels.

[1] The focus of this paper is on how job polarisation has impacted the size of the middle-income class in recent years. A broader study of how the middle class has fared in recent times is offered in OECD (2019[12]). Among other things, the study documents that across the OECD, median incomes grew at a slower pace in the last decade than in previous ones (0.3% between 2008 and 2016, versus 1% between the mid-1980s and mid-1990s, and 1.6% between the mid-1990s and mid-2000s). Middle incomes grew more slowly than those at the top. OECD-wide, median incomes grew by one-third less than those at the top 10%, over the three decades.

6. The first part of the analysis uses individual-level data and applies a descriptive decomposition to show how changes in the size of different occupations are linked to changes in the share of working adults who are in middle-income households. Furthermore, this part of the analysis documents (i) how the occupational composition of the population of working adults in households of different income levels has changed and (ii) how the probability of being in a middle-income household has changed for workers in occupations of different skill levels.

7. The second part of the analysis uses information on the whole household to study how changes in the number of working adults per household and in their occupational mix have impacted the proportion of households that belong to the middle-income group. In addition, the analysis documents how the fortunes of households with different occupational mixes have changed over time, addressing the question as to whether households increasingly need a higher skill level to gain access to the middle-income class.

8. The paper presents several new findings that offer new insights to inform the ongoing debate of the conditions of the middle class across countries.

9. The main result is that, contrary to what is often assumed, changes in the size of different occupations (i.e. job polarisation) have had a small impact on the share of working adults who belong to middle-income households. Instead, the observed changes in the share of workers in middle-income households are generally explained by changes in the propensity of different occupational groups to be in it, as the distribution of different occupational groups across income groups have changed significantly in recent times.

10. Hence, the generally modest variations in the share of workers in middle-income households mask two very significant changes for policy. First, the work composition of the middle-income class has changed substantially, with a shift towards high-skill occupations that is larger than that observed in the aggregate economy. On average, across the country considered, the share of workers in middle-income households who are in a high-skill occupation increased from 35% to 47% between mid-1990s and the mid-2010s, while the share of those holding a middle-skill job declined from 41% to 32%.

11. The second important policy implication is that occupations of different skill levels are increasingly failing to deliver the income status traditionally associated to them. The probability that a high-skill worker is in the upper-income class declined in the majority of countries. On average, the proportion of high-skill workers found in the upper-income class declined from one-quarter to one-fifth. Most middle-skilled workers are in middle-income households, but the probability that they are in the lower-income class has increased in 14 countries. In 12 countries, both low-skill and middle-skill workers have tended to move towards the lower-income class.

12. The analysis at the household-level also points to a change in the relationship between occupational skill levels and household income. In particular, the presence of two earners is becoming less effective in achieving middle-income status, as couples involving only low and middle skill workers have seen an increase in the probability of finding themselves in the lower income class.

13. Overall, therefore, the analysis highlights that some jobs increasingly fail to deliver on the promise of the relative income status traditionally associated with their skill level. These changes might help explain some of the social frustration that has been at the centre of the political debate in recent years.

2. The polarisation of the labour market and the distribution of working individuals across household income classes

14. This section offers the first evidence on how job polarisation has contributed to changing the size and composition of the group of middle-income households across 18 OECD countries. The analysis of this section focuses on working adults and their distribution across the three household income classes, defined using equivalised income.[2] The data come from the Luxembourg Income Study, the European Community Household Panel and the EU Statistics on Income and Living Conditions. The definitions of the occupational skill groups follow common practices in related literature (OECD, 2017[1]) and are discussed in Box 2.1.

[2] Throughout the paper the terms "class" and group are used interchangeably. The focus on working adults only means that the estimates reported here are different from those reported in other chapters of this publication which generally refer to the entire population. In addition, the estimates of changes in class sizes reported here differ somewhat from those recently published in Kochhar (2017[5]) who measures the classes in terms of shares of all adults. Also, the definition of middle class in this latter work differs from the one used in this chapter, which refers to the middle class as the share of adults living in a family with a household disposable income between 75% and 200% of the median. The equivalence scale used is the square root of the number of household's component. For more information on different scales and their impact on the distribution of income, see (OECD, n.d.[13])

Box 2.1. Measuring the impact of job polarisation and household working characteristics on the middle-income class.

Definitions

Middle-income class

A household is in the middle-income class when the household disposable income is between 75% and 200% of the median household income in a given year and country (see Section 3.3).

Occupations

The skill content of the job held is defined according to the ISCO-88 International Standard Classification of Occupations. All other classifications, across countries or over time, have been recoded to have a consistent 2 digit occupational coding. Low skill workers are those holding a job in sales and service and elementary occupations (ISCO 5 and 9); medium skill workers are those holding a job in clerical, craft, plant and machine operators and assemblers occupations (ISCO 4,7 and 8). High skill workers are those holding a job in managerial, professional, technicians and associate professionals occupations (ISCO 1, 2 and 3). European employment data beyond 2010 was mapped from ISCO-08 to ISCO-88 using the following methodology. In order to reconcile the ISCO-2008 classification with the ISCO-88, we collected information of the two consecutive waves of the European Union Labour Forces Surveys, in which the classification has changed. Using a fuzzy logic to match the individuals, this methodology allows to map the new coding to the old using a many-to-many mapping technique. Employment data for Canada and the United States were transposed from the respective occupational classifications (SOC 2000) into corresponding ISCO-88 classifications.

Working adults

Working adults are consistently defined as being individuals aged 16 to 64 years and normally working as employees or self-employed during the income reference period; that is to say in the year the income data refers to.

Working households.

Working households consist of those that include at least one working adult and no retired person.

Data sources

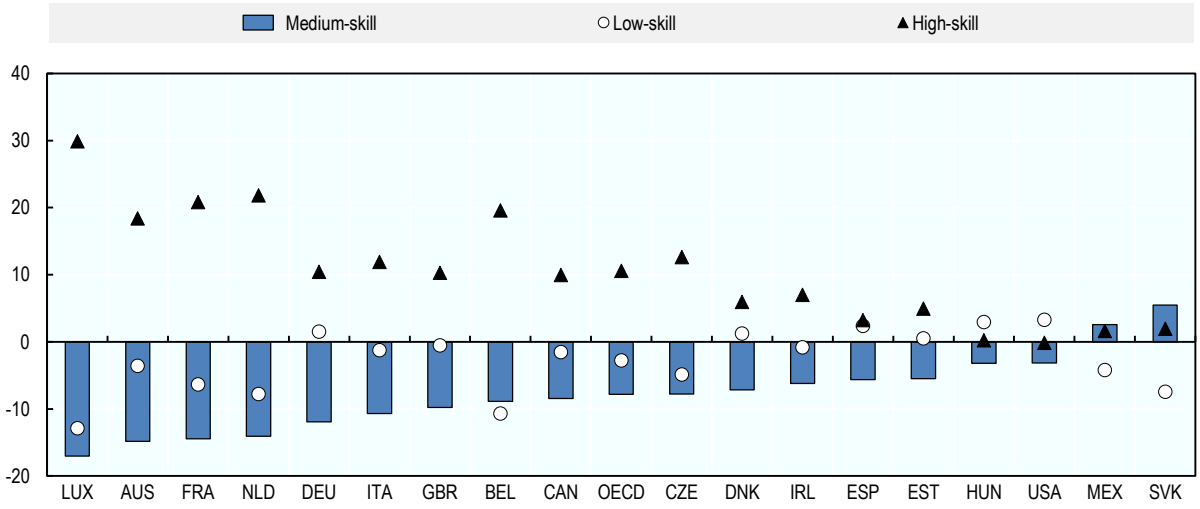
Estimates are based on data from the Luxembourg Income Study (LIS, http://www.lisdatacenter.org) for Australia (1995, 2010), Canada (1994, 2010), Czech Republic (1996, 2013), Germany (1994, 2013), Estonia (2000, 2013), Hungary (1994, 2012), Mexico (1994, 2012), Slovak Republic (1996, 2013), United Kingdom (1994, 2013) and the Unites States (1994, 2013); the European Community Household Panel (ECHP) and The EU Survey of Income and Living Conditions (EU-SILC) for Austria, Belgium, Denmark, Finland, France, Greece, Ireland, Italy, Luxembourg, the Netherlands and Spain. Data for these countries refers to weighted averages of the ECHP samples 1995 to 2000 for mid-1990s, and EU-SILC samples 2009 to 2014 for mid-2010s.

2.1. The polarisation of the occupational structure is widespread and has mostly resulted in a net shift of employment to high-skill occupations

15. Job polarisation has resulted in a net shift of employment to high-skill occupations in most countries.[3] Figure 2.1 shows changes in the employment shares by occupational skill group among all working adults in the economy. On average, across the countries considered, high-skill occupations have gained 10.6 percentage points in employment shares. Most of these have been lost by middle-skill occupations (-7.8pp), with smaller losses for low-skill occupations (-2.8pp). The aggregate share of middle-skill jobs has declined in 16 of the 18 OECD countries considered, the two exceptions being Mexico and the Slovak Republic. In 14 countries most of the decline in middle-skill jobs has been offset by an increase in high skill jobs, but in Hungary and the US, low-skill occupations have gained more. Low-skill occupations have also lost shares in 11 of the 14 countries with a declining share of middle-skill occupations, but only in Belgium did their loss exceed that of middle-skill occupations. Overall, therefore, the most common pattern is one of a decline in middle-skill jobs relative to both high and low-skill occupations, with most gains being made by high skill jobs.

Figure 2.1. Job polarisation across OECD countries, mid-1990s to mid-2010s

Percentage points change in share of working adults in each skill group



Note: See Box 1.1 for more information on the definition of skill groups.
Source: Authors' estimates. See Box 1.1 for more information.

2.2. Polarisation of household income classes is not as widespread and has mostly resulted in a net shift of working adults to the lower class

16. The polarisation of income classes has not been as widespread as the polarisation of occupational shares and the changes have mostly resulted in a net shift towards the lower

[3] This is the same qualitative conclusion as OECD (2017[1]). Note, however, that some of the detailed results do differ due to differences in data sources and methodology. In particular, OECD (2017[1]) used mostly LFS data and considered a different time period and excluded the self-employed and a number of sectors due to data issues affecting the main analysis there.

class rather than the higher one. Figure 2.2 shows that the share of working adults who belong to middle class households has declined in 12 countries and increased in 6. On average across the OECD, the middle class has lost less than half a percentage point, continuing to include about 70% of working adults. The higher-income class has lost just under a percentage point (reaching an average share of just over 13%), while the lower-income class has grown by 1.1 percentage points (to an average share of 16.5%).

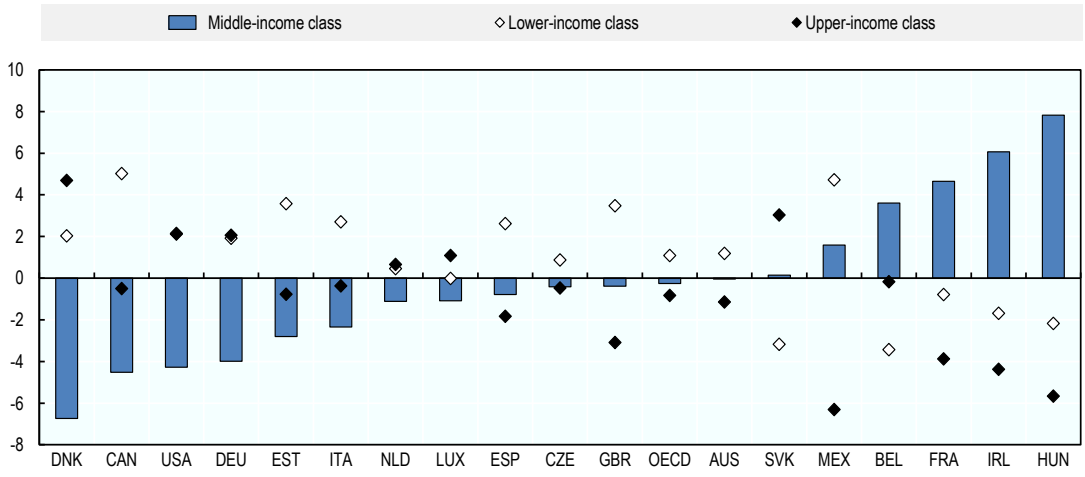
17. Among the 12 countries in which the middle class has declined, 7 have seen a net shift of working adults towards the lower-income class (Canada, Estonia, Italy, Spain, Czech Republic, Great Britain and Australia). In addition, the USA, Germany and the Netherlands have seen very similar gains in both the higher and the lower classes. Only in two of the 12 countries with a decline in the size of the middle class (Denmark and Luxembourg) has the distribution of working adults shifted towards the higher-income class.

18. On the whole, the higher-income class has lost shares in 12 countries, including 5 of the 6 countries in which the middle class has grown. Finally, the Slovak Republic stands out as the only country with a clear pattern of "upgrading", as working adults have moved away from the lower-income class (-3.2pp) and towards both the middle (+0.2pp) and the higher-income class (+3pp).

19. Despite some methodological differences (primarily due to the focus of this chapter on working adults only), Kochhar (2017[5]) finds heterogeneity in patterns across a subset of European countries, highlighting that, consistently with the findings of this chapter, the decline of the middle class is not ubiquitous. Similarly, the book edited by Vaughan-Whitehead (2016[6]) documents changes of different signs for the middle class in several EU countries since 2004, but with a prevailing negative trend in the years immediately after the recession. For the US, using CPS data for the period 1971-2015, the Pew Research Center (2015[7]) finds a decline in the middle class in the US consistently with the result in Figure 2.2, but with higher growth in the higher-income class than in the lower one.

Figure 2.2. Change in the size of the middle class, mid-1990s/mid-2010s

Percentage points change in working adults



Note: See Box 1.1 for more information on the definition of income classes.
Source: Authors' estimates. See Box 1.1 for more information.

2.3. How job polarisation has impacted the middle class

20. The different patterns observed in the changes in occupational and class shares indicate that job polarisation is not necessarily associated with a shrinking middle-income class. To investigate more formally the relationship between job polarisation and the size of the middle class, this section conducts a descriptive exercise to highlight how much of the overall change in the share of the middle class is due to changes in the size of different occupations (the occupation-size effect) and how much is instead due to changes in the propensity of different occupations to be in the middle class (holding their size constant).[45]

21. The occupation-size component highlights the direct contribution of job polarisation to changes in class sizes. It represents the change in the size of the middle class that would have occurred simply as a result of, for example, the decline in the share of middle-skill jobs, while holding the distribution of middle-skill workers across classes constant. These compositional effects depend on the initial share of a given skill group in a given class and on the size of the increase (or decrease) of the share in total employment of the skill group.

22. The change in the propensity of different skill groups to be in a given class highlights how much of the change in the size of a class is due to the movement of different skill groups across income class boundaries. Because classes are defined based on net household income, there are several factors that could cause these movements. These include changes in tax and benefits policies, changes in labour or non-labour incomes for any individual in the household, and changes in partner's occupation. A full decomposition of all these channels is beyond the scope of this paper and the possibilities afforded by the data available. Section 1. , however, provides evidence on the role played by changes in the number of working adults and in the occupational mix within households.

23. Figure 2.3 reports the contribution of each occupational skill group to the changes in the size of the middle class in terms of share of working adults. These graphs clearly illustrate the offsetting or reinforcing pressures exerted by different skill groups. It is the sum of these forces that determines the overall change in the size of the middle class which is then reported at the top of Figure 2.4. For example, the total occupation-size component for the OECD average reported in Figure 2.4 (-0.1pp) is the sum of the contributions of the three groups shows in Figure 2.3 , namely the low skill (-1.9pp), the middle skill (-5.8pp) and the high skill (+7.6pp). Similarly, the component due to changes in the propensity of different skill groups to be in the middle class reported in Figure 2.4 results from the sum of the three contributions of each skill group reported in Figure 2.3.

[4] These two components are the between-group and the within-group components from a standard shift-share decomposition. The decomposition is: $\Delta S_{ct} = \Sigma_g \Delta S_{gt} \omega_{cgt} + \Sigma_g \Delta \omega_{cgt} S_{gt}$. where ΔS_{ct} is the change in the share of working adults in class c between two points in time, ω_{cgt} is the average share of skill group g in class c between t_0 and t_1, and S_{gt} is the average share of skill group g over the same period. Δ is the difference operator between t_0 and t_1.

[5] As discussed in the literature, it is plausible that the same forces (e.g. technology or trade) that drive the decline in the share of middle-skilled jobs also cause wage declines in some of these middle-skilled jobs without necessary leading to their destruction. In this sense, it is possible that the same underlying causes drive both the "job polarisation" (i.e. the decline in the relative number of middle-skilled jobs) and the "propensity" effect (i.e. a change in the level of income associated with a given occupation) highlighted by the decomposition reported in this paper.

2.3.1. The decline in the share of middle skill and low-skill workers has pushed the middle class down…

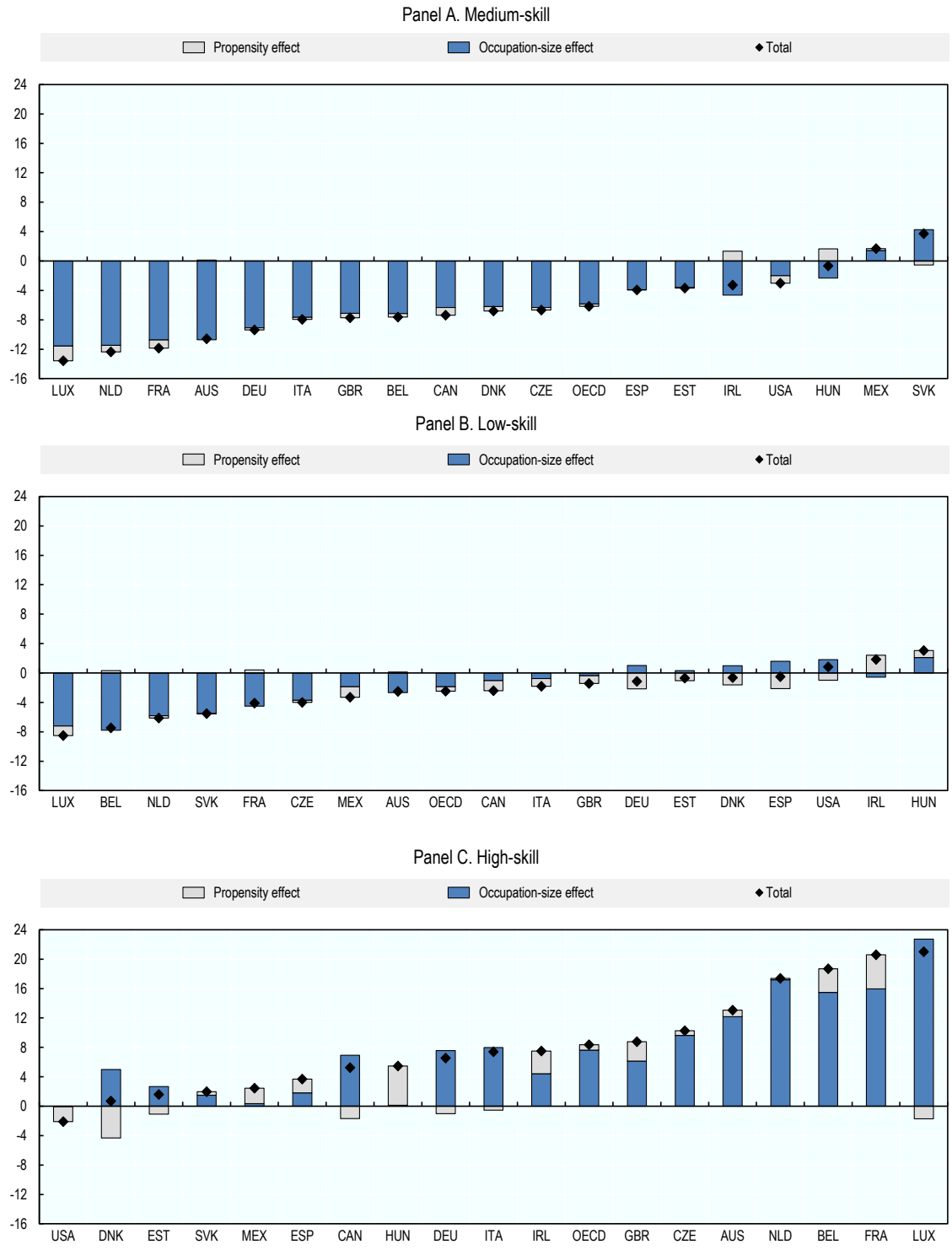
24. The decline in the share of middle-skill jobs – which is the defining feature of the job polarisation process - has exerted a strong negative force on the middle class. This is made clear by Panel A in Figure 2.3 which shows the total contribution of middle-skill workers to changes in the middle class (the dark diamond) and its decomposition into the occupation-size effect (in blue**)** and the effect due to changes in the propensity of middle-skill workers to be in the middle class (in grey**)**. Since the share of middle-skill workers has declined in most countries, the occupation-size effect is negative everywhere except in Mexico and the Slovak Republic. The figure shows that in all countries the vast majority of the total negative contribution of middle-skill workers is accounted for by large compositional effects. On average, middle-skill workers have contributed to reducing the middle class by around 6.2pp, and 5.8pp of these are simply the result of their falling numbers.

25. In most countries, however, the remaining middle-skill workers have also moved away from the middle class. In fact, changes in the propensity of middle-skill workers to be in the middle class have contributed to shrinking the middle class in 14 of the 18 countries considered and in 13 of the 16 countries where middle-skill workers made a negative total contribution to the change in the size of the middle class.

26. Low-skill workers have also exerted a negative pressure on the size of the middle class in most countries although to a lesser extent than middle-skill workers. Panel B in Figure 2.3 shows that, on average, low-skill workers have contributed to reducing the middle class by 2.5pp. The total contribution is negative in 15 countries and positive in the US, Ireland, and Hungary.

Figure 2.3. The contribution of each skill group to changes in the size of the middle class

Contribution in percentage points to the change in size of the middle-class



Note: See Box 1.1 for more information on the definition of skill groups and income classes.
Source: Authors' estimates. See Box 1.1 for more information.

27. Changes in the distribution of low-skill workers across classes play a more important role than in the case of middle-skill workers in several countries. In the countries with the largest overall positive or negative contributions, compositional changes due to, respectively, the increase or decline in the share of low-skill workers tend to dominate. But changes in the distribution of the low-skill workers across classes are more important in the middle of the chart where total contributions are smaller. In Denmark, Germany, Estonia, and Spain small positive compositional effects have been more than offset by a shift of low-skill workers out of the middle class, while in Canada, Italy and Great Britain, the changes in the propensity of low-skill workers to be in the middle class account for more than half of the overall negative contribution of this skill group. In general, low-skill workers have moved away from the middle class in 14 countries, including the US where their overall contribution has actually been positive. Section 2.5 turns to the question as to what these changes mean from the perspective of individual groups, i.e. how the probability of being in the middle class has changed for each of the occupational skill groups.

2.3.2. … but the increase in the share of high-skill workers has pushed the middle class up

28. High-skill workers have contributed to boosting the middle class in all countries except the US. The size of the boost has been substantial, as seen in Panel C of Figure 2.3. On average, high-skill workers have contributed 8.4pp to the growth of the middle class, over 7 of which stem from the increase in their relative numbers. The overall contribution is above 5pp in 12 countries and exceeds 20pp in France and Luxembourg.

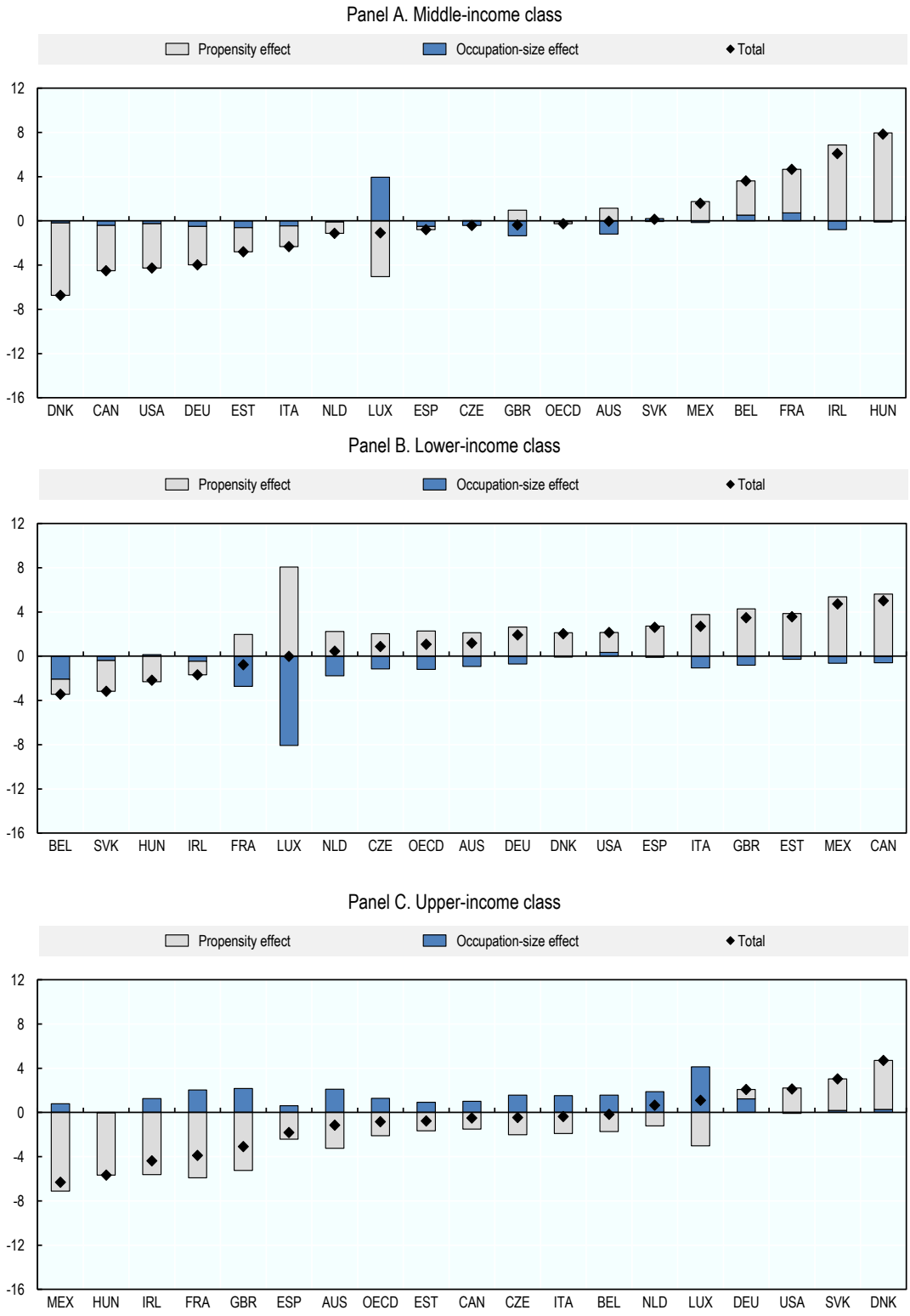
29. These contributions are generally dominated by compositional changes. In other words, because a non-negligible fraction of high-skill workers was always found in the middle class in most countries (see also Section 2.4 on this), the increase in their numbers has tended to increase the size of that class. Hungary, Spain, Mexico and the US are the only countries in which changes in the propensity of high-skill workers to be in the middle class account for over 50% of their overall contribution. The US is the only country in which both components are negative – reflecting that job growth has shifted towards low skill jobs in that country (see Figure 2.1 and Beaudry, Green and Sand (2016[8]) and Autor (2015[9])). On the whole, changes in the distribution of high-skill workers across classes have made a positive contribution to the growth of the middle class in 12 countries.

2.3.3. On the whole, job polarisation per se has had a very small impact on the size of the middle class across countries

30. Overall, the changes in the size of different occupations that have led to job polarisation have therefore had a very small impact on the size of the middle class. This is the result of the offsetting pressures arising from, on the one hand, the decline in the share of middle-skill workers (and in some countries of low-skill workers) and, on the other hand, the growth of high skill jobs. Panel A of Figure 2.4 shows that in most countries the overall sum of the occupation-size effects from the three panels of Figure 2.3 is negative and results in a very small decline in the size of the middle class. In particular, out of the 11 countries in which the middle class has declined, only in 4 (Spain, Czech Republic, Great Britain and Australia) do compositional changes account for most of the decline. But these four countries are also the ones with the smallest decline in the overall size of the middle class (below 1pp**)**.

Figure 2.4. The impact of job polarisation on class sizes

Percentage points change in the size of each class



Note: See Box 1.1 for more information on the definition of skill groups and income classes.
Source: Authors' estimates. See Box 1.1 for more information.

31. Changes in the propensity of workers in different occupations to be in the middle class account for most of the aggregate changes in the size of the middle class across countries, regardless of whether the middle class has declined or increased. The larger propensity effects observed at the two extremes of the figure are the result of the fact that in those countries all three occupational groups have seen changes in the distribution of their employment in the same direction as shown in Figure 2.3. In Denmark, Canada and the USA all skill groups have moved away from the middle class while in Ireland and Hungary they have all been drawn into the middle class. The large propensity effects seen in France and Belgium, on the other hand, are mostly explained by the shift of high-skill workers towards the middle class. Section 2.5 documents what these changes mean for the probability that workers in different occupational skill groups find themselves in the middle class.

32. The key result that changes in the share of workers in the middle class are driven by changes in the propensity of different groups to be in it rather than by job polarisation per se holds for both the pre- and post-recession period in these data. These results (not reported here) show that the small decline in the average share of workers in the middle class reported in Panel A of Figure 2.4 is driven by the post-recession period (in line with the results in in Vaughan-Whitehead (2016[6])). It should be emphasised that the time period covered in this analysis ends in 2013 and therefore excludes most of the recovery period for most countries. The small decline in the share of workers in the middle class in the years immediately after the recession is entirely the result of a change in the propensity of different skill groups to be in the middle class (indeed, the average net occupation-size effect for the post-recession period is actually positive). Section 2.5 returns to this issue when presenting results on the changes in the distribution of workers of different skill levels across income classes.

2.3.4. The higher-income class has not increased in spite the increase in the share of high-skill workers because of a decline in the propensity of all occupations to be in it

33. The widespread increase in the share of high skill jobs has not lead to an increase in the size of the higher-income class because at same time all occupational skill groups have moved away from it. Panel C of Figure 2.4 shows that compositional changes have contributed positively to the growth of the higher-income class in almost every country. This is largely the result of the growth in the share of high-skill occupations seen in almost all countries (see Figure 2.1). However, in most cases these changes have been more than offset by the shift of all skill groups away from the higher-income class.

34. On average, across the countries considered, the higher-income class has lost just under 1pp. In all but one of the 12 countries where the higher-income class has lost shares, this is because the movements away from the higher-income class of all skill groups have more than offset the increase in the share of high-skill workers, as shown in panel C of Figure 2.4**.**

35. The higher-income class has grown in only 6 countries. Even in these countries most of the change is accounted for by changes in the propensity of different skill groups to be in it, with the exception of the three countries with the smallest growth, namely the Netherlands, Luxembourg, and Germany**.**

36. The lower class has grown in most countries because all occupational groups have seen an increase in the propensity to be in it. Panel B of Figure 2.4 shows that across the countries included in the analysis, the lower-income class has gained just over 1pp in spite

of the fact that the general shifts towards higher skill occupations would have resulted in decline of this class. In fact, the compositional changes have pushed the lower-income class down in 16 countries, as the share of low and middle-skill occupations has declined relative to that of high-skill occupations in most countries. Meanwhile, 14 countries have seen the distribution of working adults shift towards the lower-income class, as shown by the positive propensity effects in Panel B of Figure 2.4. As a result, in every country where the lower class has grown this is entirely accounted for by changes in the distribution of the occupational skill groups across income classes.

37. The lower-income class has lost shares in five countries. In three of these – the Slovak Republic, Hungary and Ireland – this is mostly the result of changes in the distribution of the occupational skill groups across income classes. Only in France and Belgium is the overall decline in the lower-income class mostly accounted for by compositional changes.

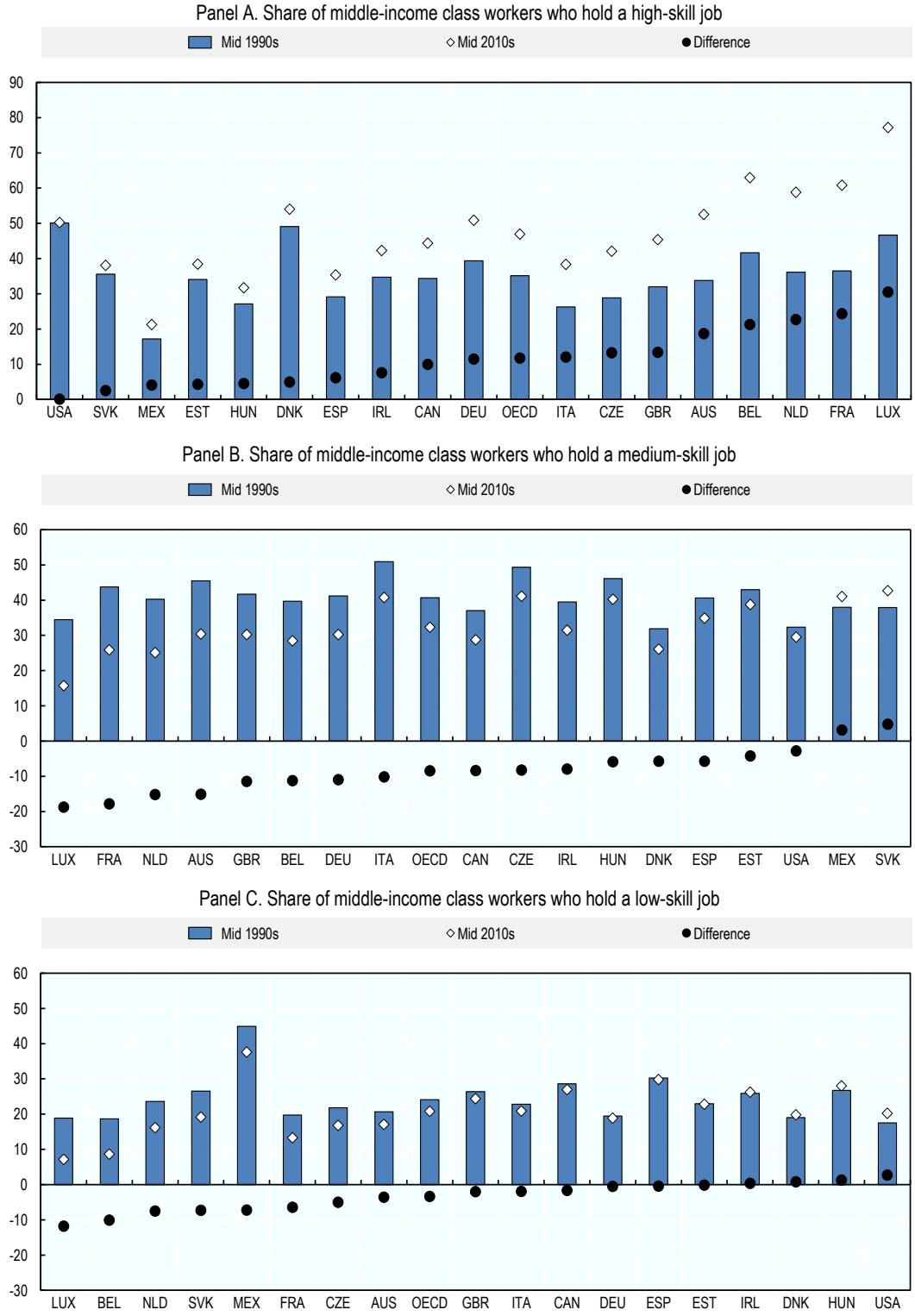
38. Hence, while job polarisation is a very pervasive process that has changed the occupational structure of all countries, its impact on the size of the different income classes has been very limited and in general has been more than offset by changes in distribution of occupational groups across classes. Nevertheless, the combination of the compositional changes induced by the polarisation process and shifts in the distribution of skill groups across classes have combined to change the composition of all classes and of the middle class in particular. The next section documents changes in (i) the composition of the middle class and (ii) in the probability of different skill groups to be in the middle class.

2.4. The middle class has become much less middle skill and much more high skill

39. The share of middle class workers who hold high skill jobs has increased in every country over the past two decades. Panel A of Figure 2.5 shows that, across the OECD, in the 1990s, 35% of middle class workers were in high-skill occupations, but by the 2010s the figure had increased to 47%, a proportional growth of almost 35%. In the 1990s, high-skill workers accounted for more than 40% of middle class workers in just 5 countries, namely Luxembourg, Belgium, Denmark, and the USA. The USA was the only country in which the high skill group accounted for over 50% of workers in the middle class. By the 2010s, the share had risen above 40% in 11 countries, exceeding 50% in 8. Interestingly, the USA only saw a negligible increase, reflecting the fact that job growth has been less skewed towards high-skill occupations in that country in recent decades (see Figure 2.1 and Beaudry, Green and Sand (2016[8]) and Autor (2015[9])). The share of high-skill workers in the middle class increased by more than 20pp in Belgium (now 63%), the Netherlands (59%), France (61%), and Luxembourg (77%).

Figure 2.5. The middle class is becoming more high skill and less middle skill

Shares of middle class workers who hold jobs in different skill groups, mid-1990s/mid-2000s



Note: See Box 1.1 for more information on the definition of skill groups and income classes.
Source: Authors' estimates. See Box 1.1 for more information.

40. Meanwhile, the share of middle class workers who hold middle-skill jobs has declined in all countries except Mexico and the Slovak Republic. On average, the figure declined from 41% to 32% between the 1990s and 2010s, as seen in Panel B of Figure 2.5. In the 1990s, middle-skill workers accounted for the majority of the middle class only in Italy, but their share was above 40% in 9 other countries. By the 2010s, only 5 countries had shares of middle-skill workers above 40%. Two of these countries (Mexico and the Slovak Republic) were also the only ones to have experienced an increase in the share over time, while in the other three countries (Italy, Czech Republic and Hungary) the figure did not exceed 42%.

41. The share of middle class workers in low-skill occupations declined in 14 of the 18 countries considered, with the average decreasing from 24% to 21%. In the 4 countries where the figure went up (Ireland, Denmark, Hungary, USA), the increases were generally small, with the largest in the USA not exceeding 3pp.

42. Overall, therefore, the composition of the middle class has changed significantly in favour of high-skill workers and against middle skill and, to a lesser extent, low-skill workers. In fact, while in the mid-1990s, middle-skill workers were the largest group in the middle class in 14 countries, by the mid-2010s that was still the case in only five countries, namely Estonia, Hungary, Italy, Mexico, and the Slovak Republic.

43. Given the widespread increase in high-skill workers seen in Figure 2.1, the lower and higher-income classes have also seen an increase in the proportion of working adults in high-skill occupations. On average, across the countries considered, the share of working adults who hold a high skill job increased by 9pp (from 22% to 31%) in the lower-income class and by 6pp in the higher-income class (from 64% to 70%). The change has generally been more pronounced in the middle class (+12pp) because the net effect of the changes in the distribution of skill groups across classes has also tended to increase the share of high-skilled workers in the middle-income class. The next section documents these changes in more detail.

2.5. Changes in the propensity of different occupations to be in the middle-income class

44. What do the changes in the size and composition of the middle class mean for the chances of workers in different occupations belonging to the middle class? This section addresses this question by studying how the probability of falling into different income classes has changed over time for each occupational skill group.

45. Figure 2.6 shows the percentage point change in the share of a given skill group found in each of three household income classes. Hence, these numbers express the change in the probability that a worker in a given skill group belongs to a household in a given class.

2.5.1. The probability that high-skill workers are found in the middle class rather than the higher-income class is increasing in many countries

46. The probability that a high-skill worker is in the higher-income class has declined in most countries. Panel A of Figure 2.6 shows that only in four countries has the high-skill group become more likely to be in the higher-income class, namely in Denmark, USA, Germany and the Slovak Republic. The average decline in the probability that a high-skill worker falls into the higher-income class has been around 4pp, bringing the proportion of high-skill workers found in the higher-income class across the OECD countries down from

25% to 21%. This decline has been compensated by similar increases in the probability of falling into both the lower and the middle classes. In the 2010s, 69% of high-skill workers were found in the middle class and 10% in the lower-income class.

47. These average changes mask considerable differences across countries. In fact, the shift from the higher to the lower class has only been substantial in Canada, Luxembourg and Estonia. In these countries the probability that a high-skill worker belongs to the lower-income class has increased by more than 5pp while the probability of being in the middle class has decreased. Seven countries, on the other hand, have seen a clear shift of high-skill workers towards the middle class. In particular, the probability that a high-skill worker falls into the middle class has increased by more than 5pp in Spain, Great Britain, Belgium, Ireland, Mexico, France and Hungary. Noticeably, in 10 of the 11 countries where the probability of high-skill workers being in middle class increased, the largest drop was recorded for the probability of being in the higher class – in other words, for high-skill workers, increases in the chances of being in the middle class have mostly been part of a downgrading rather than an upgrading process. The Slovak Republic is the only country to exhibit a clear upgrading pattern for high-skill workers.

2.5.2. Middle-skill workers have moved away from the middle class and towards the lower-income class

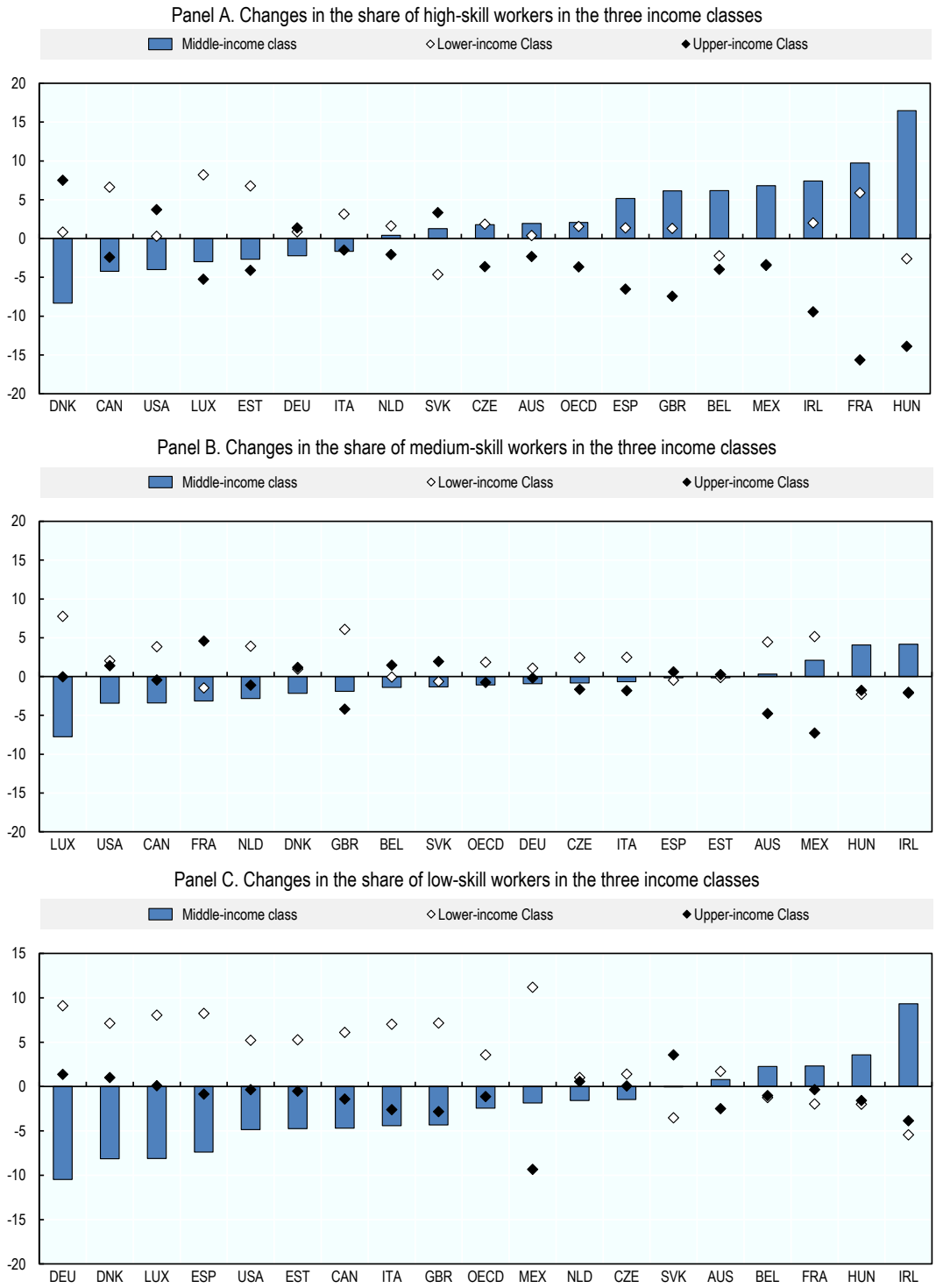
48. On average across countries, middle-skill workers have seen an increase in the probability of being in the lower-income class of around 2pp. This amounts to an increase of more than 10% from the 1990s average share of middle-skill workers (17%). The probability of being in the middle and higher-income classes has decreased by around 1pp on average. Nevertheless, middle-skill workers remain highly concentrated in the middle class, with their average share in 2010s around 73%.

49. The decline in the probability that a middle-skill worker is found in a middle income household is widespread across countries. Panel B of Figure 2.6 show that it is the case in 14 countries, with 7 countries exhibiting changes at or above the average 2pp (Great Britain, Denmark, the Netherlands, France, Canada, USA, Luxembourg). In 8 of these 14 countries, the distribution of middle-skill workers has switched towards the lower-income class. The increase in the probability of being in the lower-income class is particularly pronounced in Luxembourg (just under 8pp) and in the UK (6pp). The six countries where middle-skill workers have mostly moved away from the middle class towards the higher-income class are France, Denmark, Belgium, the Slovak Republic, Spain and Estonia (but these latter two have only seen very small changes).

50. Overall, the middle skill group has mostly shifted towards the lower class in 10 countries, while in 6 the shift has been mostly towards the higher-income class. In the remaining two countries (Hungary and Ireland) the overall switch has been towards the middle class, with similar declines in the probability for the lower and higher-income classes.

Figure 2.6. Changes in the probability that a skill group belongs to a given income class

Percentage point changes between the 1990s and the 2010s.



Note: See Box 1.1 for more information on the definition of skill groups and income classes.
Source: Authors' estimates. See Box 1.1 for more information.

2.5.3. Low-skill workers are increasingly concentrated in the lower-income class

51. On average, the distribution of low-skill workers has moved swiftly towards the lower-income class. The probability that a low-skill worker is found in a middle class household has declined by 2.5pp and that of being in a higher-income class household by 1.6pp. Conversely, the probability of being in a lower-income class has increased by 3.6pp. This change brought the share of low-skill workers who belong to lower-income class households up to 27% in the 2010s, an increase of over 15% since the 1990s. At the same time, about 67% of low-skill workers were found in the middle class across the countries considered.

52. The distribution of low-skill workers has shifted away from the middle class and towards the lower class in 13 countries. In 8 of them, the increase in the share of low-skill workers in the lower class has been between 6pp and 9pp, reaching 15pp in Mexico. Australia has also seen the distribution of low-skill workers shift slightly to the lower class, in spite of a small increase in the proportion of low-skill workers in the middle class as well. In Belgium, France, Hungary, and Ireland low-skill workers have moved more into the middle class, while in the Slovak Republic the shift has been towards the higher-income class.

53. The comparison of Panels B and C of Figure 2.6 reveals that in 11 countries both the low skill and the middle skill groups have shifted towards the lower-income class. These include only one country, Mexico, in which the middle class has not declined overall, while the remaining ten countries saw declines in the overall size of the middle class of varying magnitudes (Canada, Czech Republic, Germany, Italy, Luxembourg, the Netherlands, UK, the US, and Australia).

2.5.4. In the years immediately following the recession, the shift of middle skill workers away from the middle class was particularly pronounced

54. The time period covered in the analysis spans the recession of 2008. For most countries, data availability constraints at the time of writing means that the post-recession recovery is not included. Section 2.3 highlighted that the changes in the distribution of occupational skill groups across classes drove the overall changes in the size of the different classes both before and after the recession. Figure 2.7 shows that there are some notable differences before and after the recession in the direction and magnitude of the changes for different skill groups. The figure reports some key results for two sub-periods, the first spanning 1995-2007 and the second one 2007-2013 for most countries.

55. On average across the countries considered, the shift of high-skill workers away from the high-income class was less pronounced in the period straddling the recession. Panel A of Figure 2.7 shows that the average decline in the probability that a high-skill worker is in a high-income class household was only around a tenth of that observed in the pre-recession period (0.4pp vs 3.3pp), a difference that is not accounted for by the differences in the length of the two time periods.

56. The probability that a high skill worker is in the higher-income class declined in 12 countries before the recession, but only in 9 after it. Belgium, Canada and Italy saw a larger negative change in the post-recession period than before. This is also the case for France and the Netherlands, once the difference in the length of the two sub-periods are accounted for. For Australia and Luxembourg, the decline reported in Figure 2.6 for the whole period is driven by the post-recession years, since high-skill workers actually saw

an increase in the probability of being in the higher-income class in the years before the recession.

57. Among the nine countries with a post-recession increase in the probability that high-skill workers are found in the higher-income class, the largest changes exceeding 2.5pp were seen in the Slovak Republic, Denmark, USA, and Estonia. In all cases but the latter, this was a continuation or even an acceleration of the pre-recession trend.

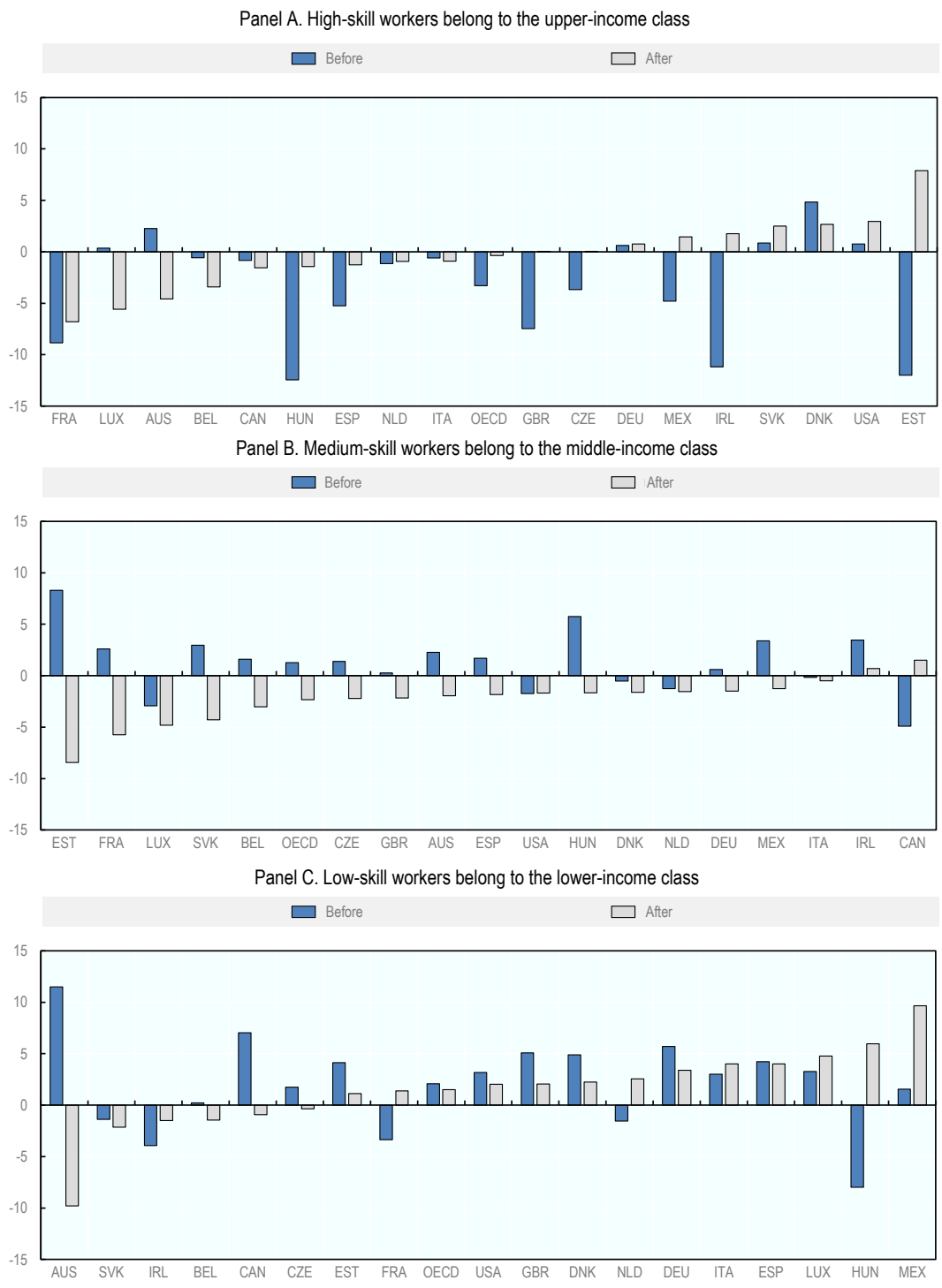
58. The shift of middle-skill workers away from the middle class highlighted in Figure 2.6 for the whole period is entirely driven by the post-recession years. On average across countries, the probability that a middle-skill worker is in middle-class household declined by over 2.3pp, more than offsetting the increase from the pre-recession period (panel B of Figure 2.7). In one of the most robust results across countries observed in this analysis, all but two countries (Ireland and Canada) have a negative sign in the post-recession period. Ireland saw a continuation of the positive trend of the pre-recession years, while Canada was the only country in which the figure declined before the recession and increased afterwards.

59. The post-recession decline in the probability of being in the middle class for middle-skill workers was not associated with a clear shift towards the lower-income class. On average across countries, the probability of being in the lower-income class increased by 1.3pp and that of being in the higher-income class by 1pp. While, as emphasised elsewhere the factors affecting the distribution of individuals across household income classes are multiple, this is suggestive that the recession disproportionally affected the employment and earnings of the subset of middle-skill workers who are found in middle-class households.

60. Low-skill workers became more concentrated in the lower-income class both before and after the recession. In fact, Panel C of Figure 2.7 shows that the recession appears to have accelerated the process, since the average increase in the probability of being in the lower-income class was 2pp before the recession and 1.5pp for the much shorter post-recession period. In the post-recession period, six countries saw a decline in the probability that a low-skill worker is in the lower-income class. Three of these (the Slovak Republic, Ireland and Belgium) are countries for which the figure for the overall period is negative. In the remaining three countries (Australia, Canada, and the Czech Republic) the post-recession decline only partially offset the pre-recession increase resulting in an overall increase in the probability that low-skill workers are found in the lower-income class.

Figure 2.7. Changes in the probability that a certain skill group belong to a certain income class, before and after the recession

Percentage point changes between the 1990s and the 2010s



Note: See Box 1.1 for more information on the definition of skill groups and income classes.
Source: Authors' estimates. See Box 1.1 for more information.

2.5.5. The changes in the distribution of skill groups across classes challenge social expectations on the class status delivered by different types of jobs

61. The changes in the distribution of skill groups across classes documented in this section challenge the social expectations on the class status delivered by different types of jobs. The results suggest that in a large number of countries, high skill jobs are increasingly failing to deliver on the promise of access to the higher-income class, while middle and low skill jobs increasingly leave working individuals observing the middle class from below.

3. How changes in the number of working adults and in the occupational mixes within households have affected the income classes

62. The previous analysis has shown that changes in the propensity of different occupational groups to be in a given class play a much more important role than job polarisation per se in explaining changes in the share of working adults in each income class. Because the income classes are defined using (equivalised) net household income, the movements of occupational groups across classes can be driven by a number of factors. These include policy changes (i.e. in the tax and benefit system), changes in labour or non-labour incomes for any individual in the household, and changes in partner's occupation (i.e. assortative matching). While a full decomposition of all these channels is not feasible with the data at hand, this section moves the focus to the household level to assess the importance of changes in the number of working adults within households and in the mix of jobs they hold.

63. Previous studies have argued that the increase in dual earner households driven by the growth in female participation has generally tended to increase the ranks of the middle class in recent decades (Vaughan-Whitehead, Vazquez-Alvarez and Maître, 2016[4]). On the other hand, increasing inequality might mean that only households with a second earner in certain jobs might secure a place in the middle class. This section tackles directly these issues. The analysis documents the contribution to changes in the size and composition of the middle class of households with one or two working adults and of households featuring different occupational mixes.

64. The results show that between the 1990s and 2010s, the number of single-adult households and dual-earner couples has increased relative to that of single-earner couples in most countries. These compositional changes have not sustained the growth of any particular class but, together with the movements of households across classes, have resulted in a significant change in the composition of the middle class in favour of single-adult households and against single-earner and (to a lesser extent) dual-earner couples.

65. Changes in the distribution of household types across income classes mean that single-earner couples and single-adult households are finding it increasingly difficult to enter the middle or the higher class. Dual-earner couples, on the other hand, have had different experiences in different countries, but couples that include at least one high-skill worker in general are more sheltered from shifts in the distribution towards the lower classes. In addition, there are clear signs in some countries that couples with the second earner in low or middle-skill jobs are facing growing challenges as their distribution has shifted away from the middle and higher-income classes.

66. To begin, Figure 3.1 shows the changes in the relative size of the three income classes across "working households" (i.e. households with at least one working adult and no retired adults). This figure is different from Figure 2.2 which looked at shares of working individuals, rather than shares of households.

3.1. Changes in the share of working households in the middle class vary across countries

67. The share of working households in the middle class has declined in 11 countries and increased in 7 since the 1990s. As a result of the variation across countries, on average the overall changes have been negligible, with the lower class gaining just over 1pp from the other two classes. In the 2010s, the average household share of the lower class was 21.5%, that of the middle class 67% and that of the higher-income class 11.5%.

68. The distribution of households shifted more towards the lower class in 9 of the 11 countries in which the middle class has lost shares.[6] Among the seven countries where the middle class has gained shares in terms of households, only France and Mexico have seen stronger growth in the lower class than in the middle class. Noticeably, only in 2 of the 18 countries considered here, Denmark and the Slovak Republic, has the distribution of households across classes shifted (slightly) towards the higher-income class.

69. Figure 3.2 shows trends in the aggregate share of households by number of working adults. In particular, the figure looks at the changes in the share of households with (i) two working adults (i.e. Dual-earner couples, or DEC), (ii) couples with one working adult (i.e. Single-earner couples, or SEC) and (iii) a single adult who is in work (Single Adult, or SA).

3.2. In most countries, the number of single-adult households and dual-earner couples has increased relative to that of single-earner couples

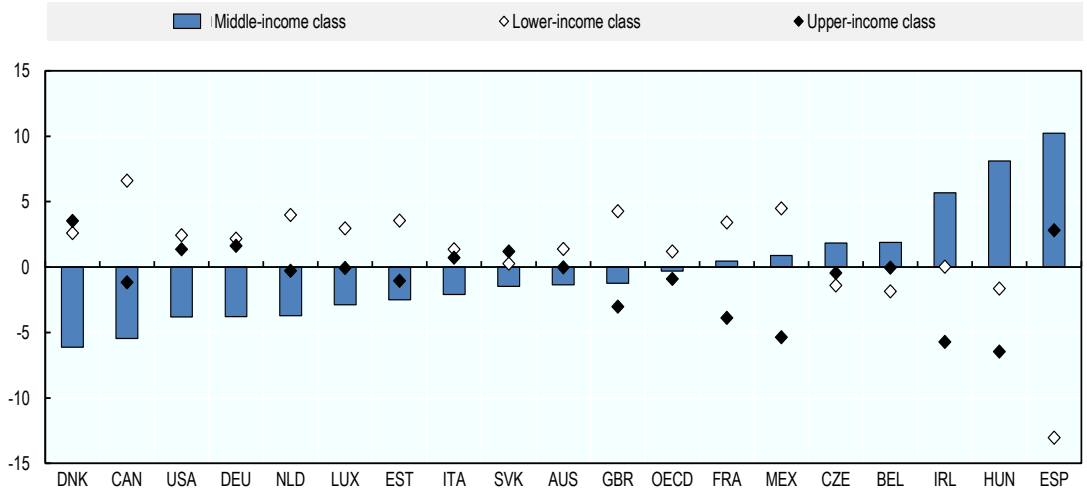
70. The share of single-adult households has increased in 14 of the 18 countries considered. The average increase among all countries is just over 7pp, but 8 countries had increases in excess of 10pp. The three largest increases are recorded in Belgium, Germany and Luxembourg.

71. Among households with two adults, there has been an increase in the fraction of those with both adults in work. On average across countries, dual-earner couples lost just under 1pp and single-earner couples just over 6.5pp in working household shares. In fact, this pattern is observed in 12 of the 18 countries, with the three largest differentials in the growth of single and dual-earner couples seen in Spain, Mexico and Luxembourg, where the share of dual-earner couples in the 1990s was very low (see section 3.4).

72. How has the growth of single-adult household impacted the different classes? Has the relative growth of dual-earner couples tended to increase the size of the middle class? How has the composition of different income classes changed? And how are different types of households faring now? For example, are households with a single working adult struggling to gain middle class status more than in the past? The next section takes on these more formally.

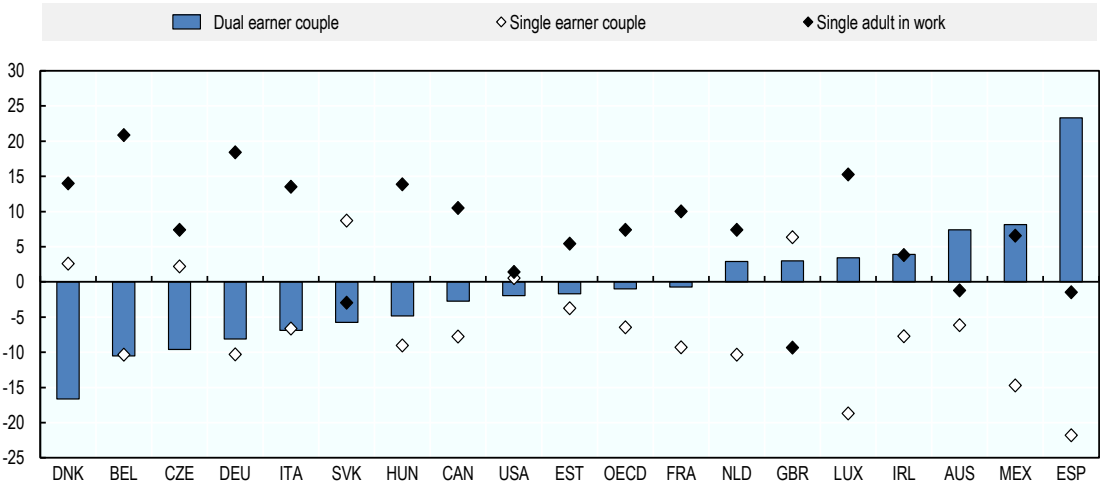
[6] The results for the US are qualitatively in line with those of Alichi et al. (2016[11]) who also finds that, in terms of household shares, the middle class in that country has lost more shares to the lower-income class than to the higher income one. Note however, that (i) they classify as middle class households with a total income between 50 and 150 per cent of the median income and (ii) that their sample includes all households (hence including those with no working adults and at least one retired person) whose head is aged 24-64.

Figure 3.1. Changes in the size of the three classes using household shares



Note: Households with no working adults or with at least one retired person are excluded. See Box 1.1 for more information on the definition of income classes.
Source: Authors' estimates. See Box 1.1 for more information.

Figure 3.2. Changes in the aggregate shares of Dual-earner couples, Single-earner couples, and Single Adult



Note: Households with no working adults or with at least one retired person are excluded. See Box 1.1 for more information on the definition of income classes.
Source: Authors' estimates. See Box 1.1 for more information.

3.3. The growth of single-adult households and dual-earner couples has had a limited impact on the size of the middle class

73. This section presents the results of a simple shift-share analysis which decomposes changes in the size of each income class in terms of households into two components. The first one, i.e. the between-group component, is the part of the total change that is due to the changes in the prevalence of different household types (i.e., single-adult household, dual-earner couples and single-earner couples). This component shows, for example,

whether the growth of dual-earner couples has contributed to increasing the share of middle class households.

74. The second component, i.e. the within-group one, represents the part of the overall change in a class size that is accounted for by the fact that different types of households have shifted across income classes. This component shows, for example, whether the lower-income class has grown as a result of increasing segregation of single-adult households in this income class.

3.3.1. Changes in the shares of different types of households have not sustained the growth of any specific income class

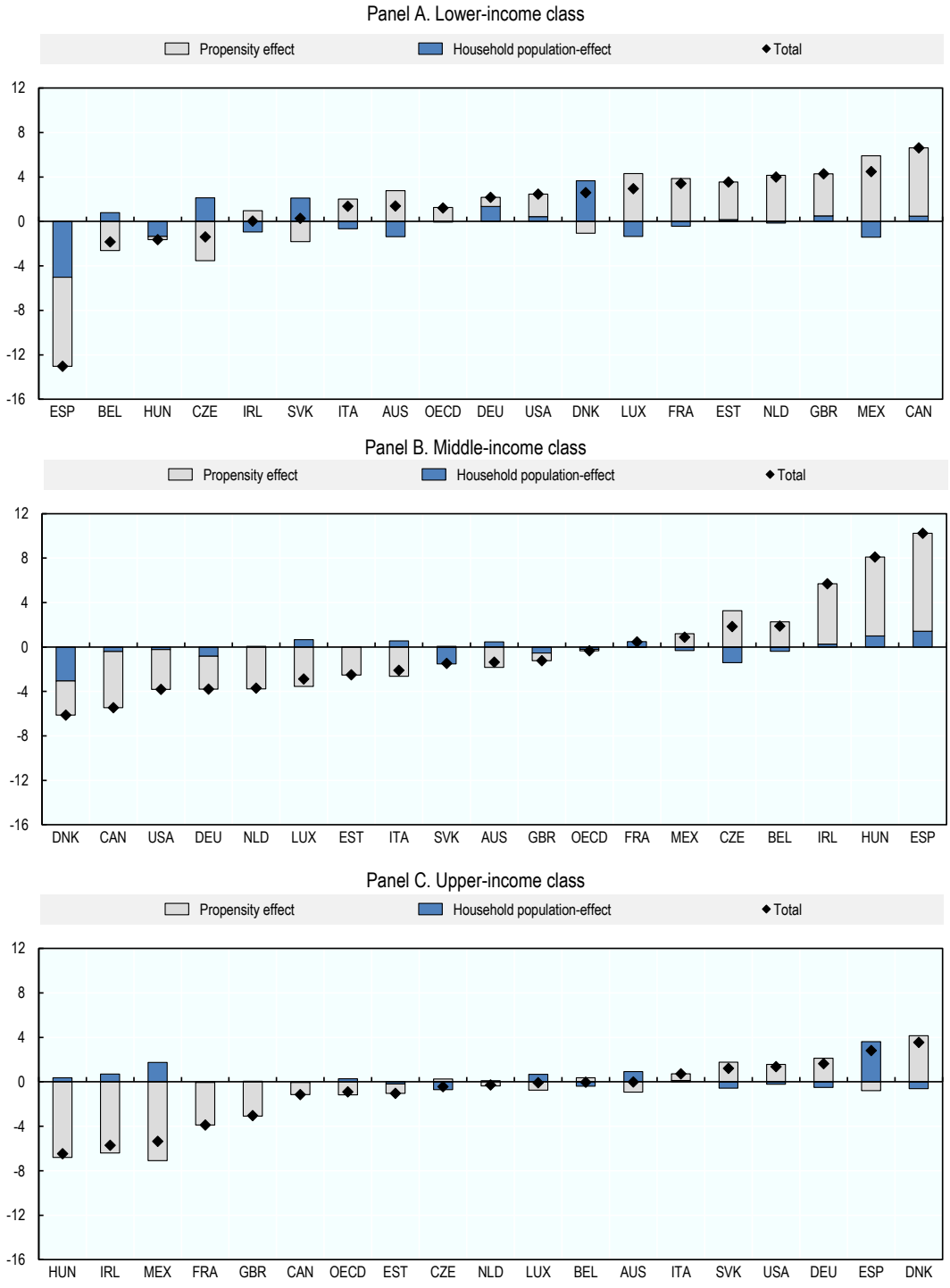
75. Both positive and negative changes in the size of the middle class across countries are driven by changes in the distribution of households across classes, rather than by compositional changes (Panel B of Figure 3.3). In fact, the contributions of each group of households (which are not reported here) are generally dominated by the compositional effects. But, in the aggregate, most of these compositional effects tend to offset each other, resulting in the small aggregate components reported in Figure 3.3. On average across all countries the net compositional (or between-group) component is very small. Similarly, the average within-group component is small, but this masks considerable variation across countries.

76. Changes in the distribution of household groups across classes vary considerably across countries and ultimately account for most of the overall changes in the size of the middle class. In particular, within-group changes account for at least 80% of the change in almost all countries where the middle class lost shares. The two exceptions are Denmark – where within-group changes account for 50% of the decline - and the Slovak Republic, which is the only country where the (small) compositional change dominates. In the seven countries where the middle class grew, within-group changes account for over 85% of the change - except in France, where the compositional change drives the overall change.

77. Panels A and C of Figure 3.3 show that the growth of single-adult households and that of dual-earner couples has not sustained the growth of the lower or higher-income classes either. Similar to the middle class, most of the changes in the size of the lower and higher-income classes are driven by the reallocation of different types of households across classes.

78. The growth in the lower-income class is mostly accounted for by single-earner couples and single-adult households. In fact, their within-group contribution to the lower class is positive in at least 12 of the 18 countries considered. No clear pattern emerges across countries in terms of which group of households tend to account for most of the within-group changes in the middle or higher-income class, with results varying across countries. For the sake of brevity, the details of these results are not presented here. The next sections, however, provide more information on the fortunes of the individual household types. In particular, Section 3.4 documents how the changes described above have altered the composition of the middle class, while Section 3.5 turns to the important question of what these changes mean for the probability of different types of household being in the middle class.

Figure 3.3. Decomposition of changes in the middle class as a share of households



Note: Households with no working adults or with at least one retired person are excluded. See Box 1.1 for more information on the definition of income classes.
Source: Authors' estimates. See Box 1.1 for more information.

3.4. There are more single adults and fewer single-earner couples in the middle class

79. The combination of offsetting compositional changes and concurring within-group changes described in the previous section have affected significantly the composition of the middle class in terms of household types.

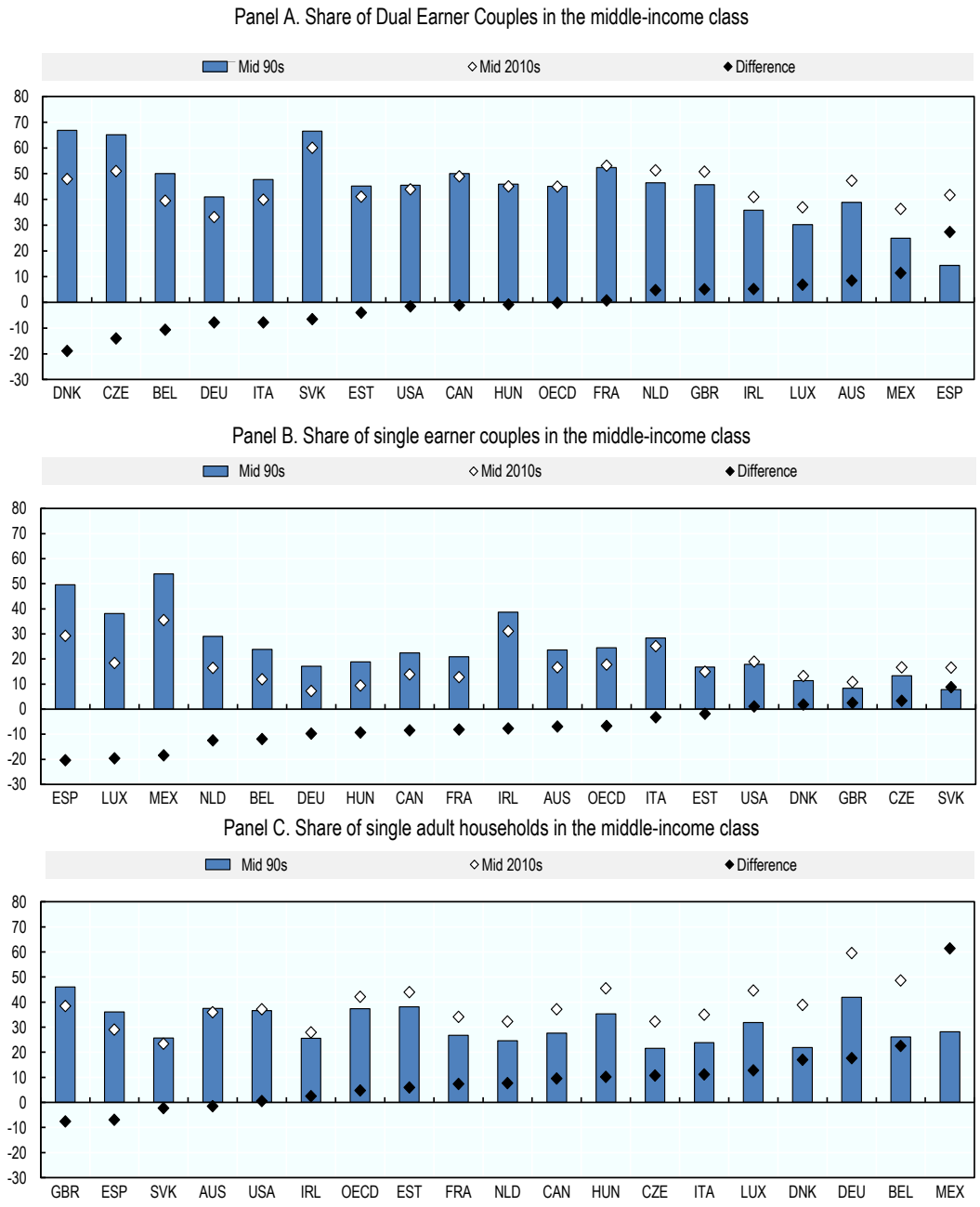
80. Figure 3.4 shows that the average share of dual-earner couples in the middle class has remained stable at around 45%. However, this stability is the result of diverging patterns across countries, with 8 seeing an increase in the share and 10 a decline. The decline in the share of dual-earner couples in the middle class was largest in Denmark, the Czech Republic and Belgium, while the increase was largest in Spain, Mexico and Australia. The US, France and Canada only experienced negligible changes.

81. The share of single-earner couples among middle class households declined in 13 of the 18 countries considered here. On average, the figure declined by 7pp, falling below 18% in the 2010s. In Mexico, Spain and Luxembourg the change was much larger at around 20pp. In the 1990s, the proportion of single-earner households in the middle class was above 20% in 10 countries (with two countries - Mexico and Spain – above 40%), but by the 2010s only 4 countries remained over that threshold (and none were above 40%). The five countries that experienced an increase in the share of single-earner couples in the middle class were the ones with the lowest initial levels, namely the US, Denmark, UK, Czech Republic, and Slovak Republic.

82. The share of single-adult households in the middle class increased in 14 countries. On average the increase was around 7pp, taking the average share of single-adult households in the middle class to 37.5%. In the 1990s, only two countries (the UK and Germany) had shares of single-adult households in the middle class above 40%, but by the 2010s the number had increased to 5. The UK is actually one of the 4 countries (along with Spain, the Slovak Republic and Australia) where the share of single-adult households in the middle class declined.

83. Hence, overall, the composition of middle class households has changed in favour of single-adult households and against single earner and (to a lesser extent) dual-earner couples. The compositional change within the middle class largely reflects the overall change in the composition of household population at large (Figure 3.2). In fact, the net impact of the changes in the propensity of different types of households to be in the middle class on the composition of the middle class has generally been small. These changes are described in more detail in the next section.

Figure 3.4 There are more single adults and fewer single-earner couples in the middle class



Note: Households with no working adults or with at least one retired person are excluded. See Box 1.1 for more information on the definition of income classes.
Source: Authors' estimates. See Box 1.1 for more information.

3.5. Changes in the propensity to be in the middle class for different types of households

84. The shift-share analysis of the previous sections shows that changes in the distribution of households across classes account for most of the aggregate changes in class sizes. This section asks what this means from the perspective of the different groups and

documents the changes in the probability that households with different number of working adults fall into different income classes.

85. As mentioned above, these changes can be driven by a number of factors, including changes in the tax and benefit system, changes in labour or non-labour incomes for any individual in the household, and changes in partner's occupation. A full decomposition of these channels is beyond the scope of this chapter, but the results presented here offer a detailed picture of the net effect of all these factors on the fortunes of the different household groups considered.

86. The results show that dual-earner couples have had different experiences in different countries, while in most countries single-earner couples and single-adult households are finding it increasingly difficult to access the middle or the higher class.

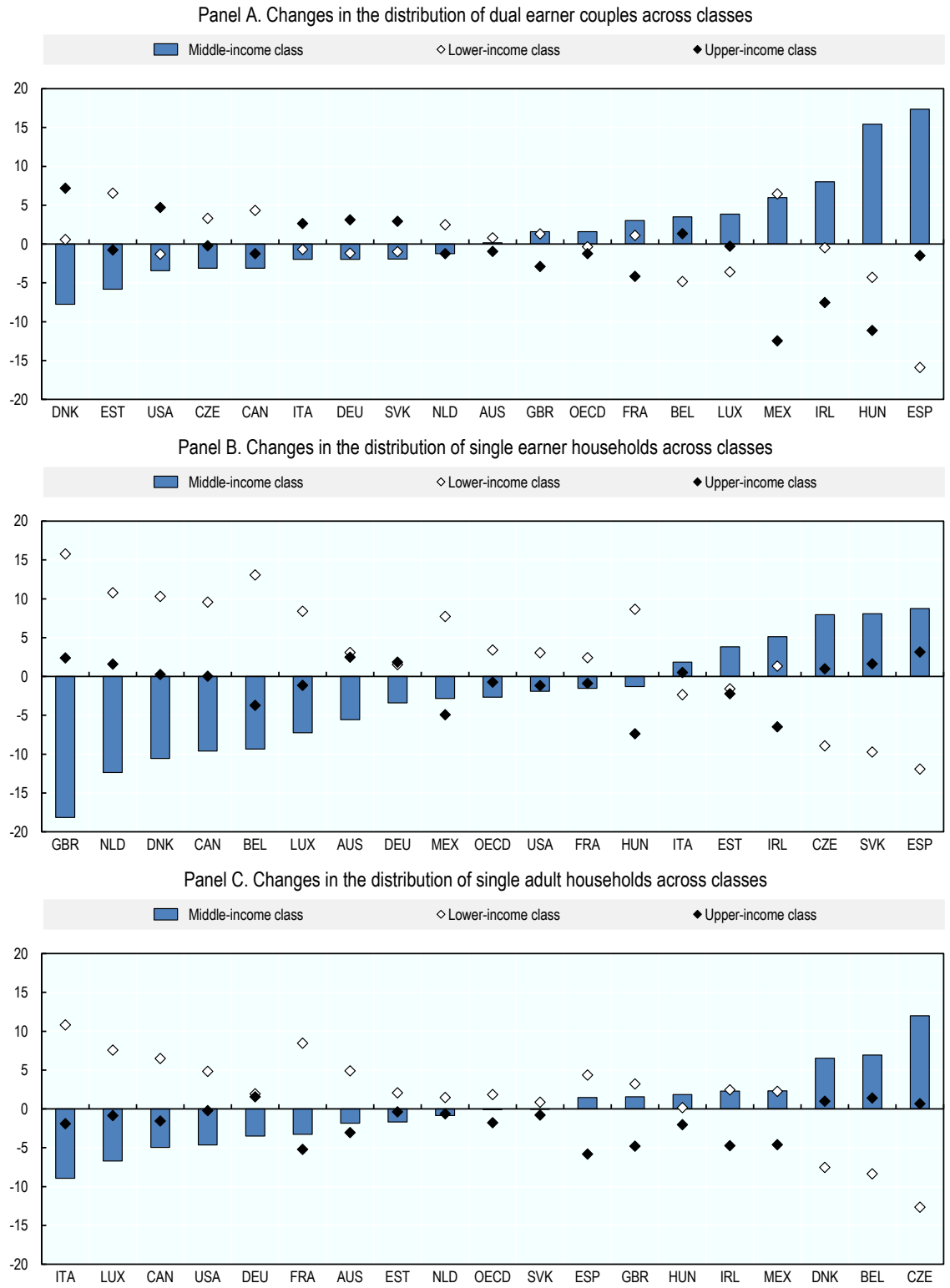
3.5.1. The fortunes of dual-earner couples vary across countries

87. On average across countries, the probability that a dual-earner couple is found in the middle class has increased slightly by 2pp, bringing the proportion of dual-earner couples that are found in the middle class to just over 73%. However, this result masks considerable variation across countries ((Figure 3.5). In nine countries, dual-earner couples have actually seen a decline in the probability of finding themselves in the middle class. In five of these countries (Denmark, the US, Italy, Germany, Slovakia) they have become more likely to be found in the higher-income class, while in the remaining four (Estonia, Czech Republic, Canada and the Netherlands) the shift has been mostly towards the lower-income class.

88. In eight of the nine countries in which dual-earner couples have seen an increase in the probability of being in the middle class, they have also seen a decline in the probability of being in the higher-income class. Hence, for these countries the shift towards the middle class has been part of a downgrading process. However, in three countries (Belgium, Luxembourg, and Spain) dual-earner couples have shifted towards the middle class more from the lower one than from the higher one.

89. Overall, therefore, the fortunes of dual-earner couples across the countries considered have followed a variety of patterns without a clearly prevailing trend emerging across countries.

Figure 3.5. Changes in the distribution of households across classes



Note: Households with no working adults or with at least one retired person are excluded. See Box 1.1 for more information on the definition of income classes.
Source: Authors' estimates. See Box 1.1 for more information.

3.5.2. In most countries, the probability that single-earner couples are in the middle class has declined

90. Single-earner couples have seen a decline in the probability of being in the middle class in 12 countries, and in all of these except Germany they have moved mostly towards the lower-income class. On average, the probability that a single earner couple is found in the middle class declined by about 3pp – a decline of almost 5% from the initial average share of 62%. In Belgium, Canada, Denmark, the Netherlands and the UK the decline was noticeably larger, exceeding 9pp.

91. The increases in the probability that a single earner couple is found in the lower-income class have been large in several countries. The average across all countries considered is 3.5pp, which translates into a proportional increase of 11% in the share of single-earner couples found in the lower-income class (from 31% to 34.5%). In eight countries the increase was at least twice as large as the average, with the highest values observed in UK (+16pp), Belgium (+13pp) and the Netherlands (+10.8pp).

3.5.3. Single-adult households are increasingly found in the lower-income class in almost all countries

92. The probability of a single-adult household being in the middle class has declined in 11 countries and increased in 7, resulting in a negligible change on average (Panel C in Figure 3.5) in the share of single-adult households found in the middle class (65%). In all of the countries where the probability of being in the middle class has declined, the distribution of single-adult households has shifted towards the lower class. In addition, this has also happened in three of the countries where the probability of being in the middle class has not declined.

93. Overall, therefore, single-adult households have seen their distribution shift towards the lower class in as many as 14 countries. The increase in the probability of being in the lower-income class was on average 2pp, bringing the share of single-adult households in the lower-income class to 27% (a proportional increase of +8%). Seven countries saw an increase in the probability that a single-adult household is in the lower-income class at least twice as large as the average 2pp, with the largest changes recorded in Italy (+10pp), France (+8pp) and Luxembourg (+7.5%).

94. In three countries (Belgium, Czech Republic, Denmark), the changes for single-adult households were quite different, as they moved away from the lower-income class towards the middle and the higher-income ones.

95. Hence, the prevailing pattern across countries is that single-earner couples and single-adult households are finding it increasingly difficult to access the middle or the higher-income classes. Dual-earner couples, on the other hand, have had different experiences in different countries.

3.6. The role of occupational mixes in dual earner households

96. The previous section found that the probability that a dual-earner couple belongs to the middle income class has changed in different ways, without a clearly prevailing pattern emerging across countries. This result for all dual-earner couples might mask important differences depending on the specific occupations of the working adults. This section looks at changes in the distribution of households with different occupational mixes, focusing on two groupings in particular.

97. First, the analysis looks at the changes in the distribution across classes of couples with and without at least one high-skill worker. Based on the results so far, it is plausible that households with at least one high-skill worker might do relatively better. Second, the analysis looks at changes in the distribution across income classes of households grouped by the occupation of the second earner. This evidence reveals whether entering the middle class increasingly requires a higher occupational status for the second earner.

3.6.1. The presence of a high-skill worker in the couple helps prevent the shift towards the lower-income class

98. The two panels of Figure 3.6 report the changes in the distribution across income classes for dual-earner couples with at least one high-skill worker (Panel A) and dual-earner couples without any high-skill workers (Panel B).

99. The presence of a high-skill worker in the couple helps prevent the shift towards the lower-income class. In fact, while both groups have seen a reduction in the probability of being in the higher-income class, couples involving only middle or low-skill workers have moved slightly towards the lower-income class, while the downward shift of couples involving at least one high-skill worker has tended to stop at the middle class in most countries. In line with the results discussed in section 2.5, this advantage of dual-earner couples with at least one high-skill worker was particularly pronounced in the years straddling the recession, when the shift towards lower classes of the high-skill workers slowed down.

100. On average across all countries, for a dual-earner couple with at least one high-skill worker, the probability of being in the middle income class has increased by 4.5pp, almost entirely compensated for by a decline in the probability of being in the higher class (4.4pp). This has brought the average share of dual-earner couples with at least one high-skill worker who are found in the middle class up to 70.5% in the 2010s. For dual-earner couples without any high-skill workers, the probability of being in the lower-income class has increased by just under 2pp. As a result, the share of dual-earner couples without any high-skill workers who were in the lower middle class in the 2010 stands at 17%.

101. Nine countries have seen a net shift of couples with at least one high-skill worker towards the middle class. In 4 countries, this group has seen a net shift towards the higher-income class (Germany, Denmark, Slovak Republic and the US) and in the remaining 5 towards the lower-income class (Canada, Czech Republic, Estonia, Italy and the Netherlands).

102. The distribution of dual-earner couples without any high-skill workers has shifted towards the bottom in as many as 13 countries. Four countries (Spain, Hungary, Ireland and Italy) have seen a shift towards the middle income class. In all four except Italy (which experienced the smallest changes), this was mostly a result of a shift away from the higher-income class rather than the lower one. Finally, only in Belgium did the distribution of couples without any high-skill workers shift towards the higher-income class.

3.6.2. Couples with the second earner in low or middle-skill occupations are not leaving the middle class everywhere, but are facing new challenges in some countries

103. Panel A of Figure 3.7 shows that in twelve countries couples with the second earner in a high-skill occupation are now more likely to be in the middle class than in the past. In almost all countries this switch towards the middle class has happened while the probability

of being in the higher-income class has decreased. This is consistent with the previous results indicating that high-skill workers are increasingly struggling to enter the higher-income class. On average, across all countries, for a couple with a second earner in a high-skill occupation the probability of being in the middle class has increased by 3.6pp and that of being in the higher-income class has declined by 3.1pp.

104. In four of the six countries in which couples with the second earner in a high-skill occupation have seen a decline in the probability of being in the middle class, this has happened as part of a switch mostly directed towards the higher-income class. These countries are Denmark, USA, Italy and the Slovak Republic. Estonia and Canada, on the other hand, have seen larger increases in the probability of being in the lower class for this group.

105. Panels B and C show that there is no clear indication that couples with the second earner in a middle or low-skill occupations are finding it more difficult to be part of the middle class across countries. On the contrary, in both panels, the average change in the probability of being in the middle class is positive (+2.3pp in Panel B and +0.9pp in Panel C). Nevertheless, there are clear signs of increasing difficulties for these groups in several countries.

106. Panel B shows that in 7 countries households with a second earner in a middle-skill occupation have seen their distribution shift towards the lower-income class. In 6, this shift has been towards the middle class, and in the remaining 5 towards the higher-income class. Most changes are rather small, but Hungary, Mexico and Spain have undergone significant ones. In particular, in these three countries, households with the second earner in a middle-skill occupation have seen increases in the probability of being in the middle class of at least 9pp (and 25pp in Spain). In the case of Mexico, this happened as part of a clear downgrading process, as the probability of being in the lower class increased even more, while that of being in the higher class declined by over 25pp.

107. Panel C shows that for households with a second earner in a low-skill occupation there is no clearly dominant pattern across countries in terms of net shifts to a given class either. In fact, in 8 countries these households have seen their distribution shift towards the lower class, in 6 towards the middle one and in the remaining 4 towards the higher-income class.

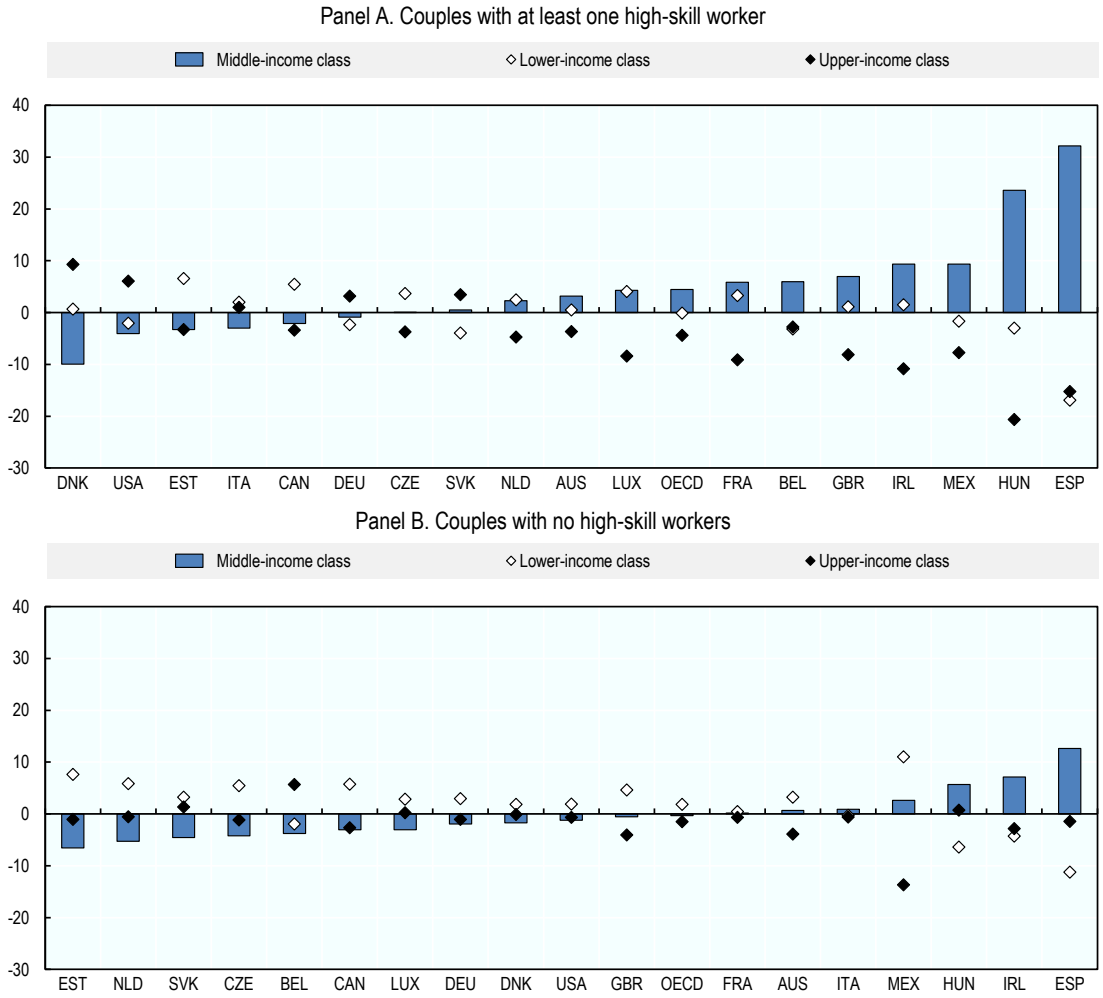
108. While there is no uniform picture across countries emerging from this analysis, there are clear signs for a number of countries that couples with second earners in middle or lower skill occupations are facing new challenges. In particular, there are six countries in which both these types of households have seen their distribution shift towards the lower-income class, namely Canada, Czeck Republic, Estonia, Luxembourg, Mexico and the Netherlands.

109. In addition, Panel B shows that in seven of the 8 countries in which the probability of being in the middle class increased for couples with the second earner in a middle-skill job, this happened mostly as a result of the reduction in the probability of being in the higher-income class. Panel C shows that for couples with the second earner in a lower skill occupation, this was the case in 3 of the 10 countries that saw an increase in the probability of being in middle class, namely the US, Mexico and Ireland.

110. Overall these results highlight that while there is not a clear common pattern across countries of couples with second earners in middle or low-skill occupations increasingly failing to make it to the middle income class, in several countries there are signs that they

face increasing challenges as their distribution has shifted away from the middle and higher-income classes.[7]

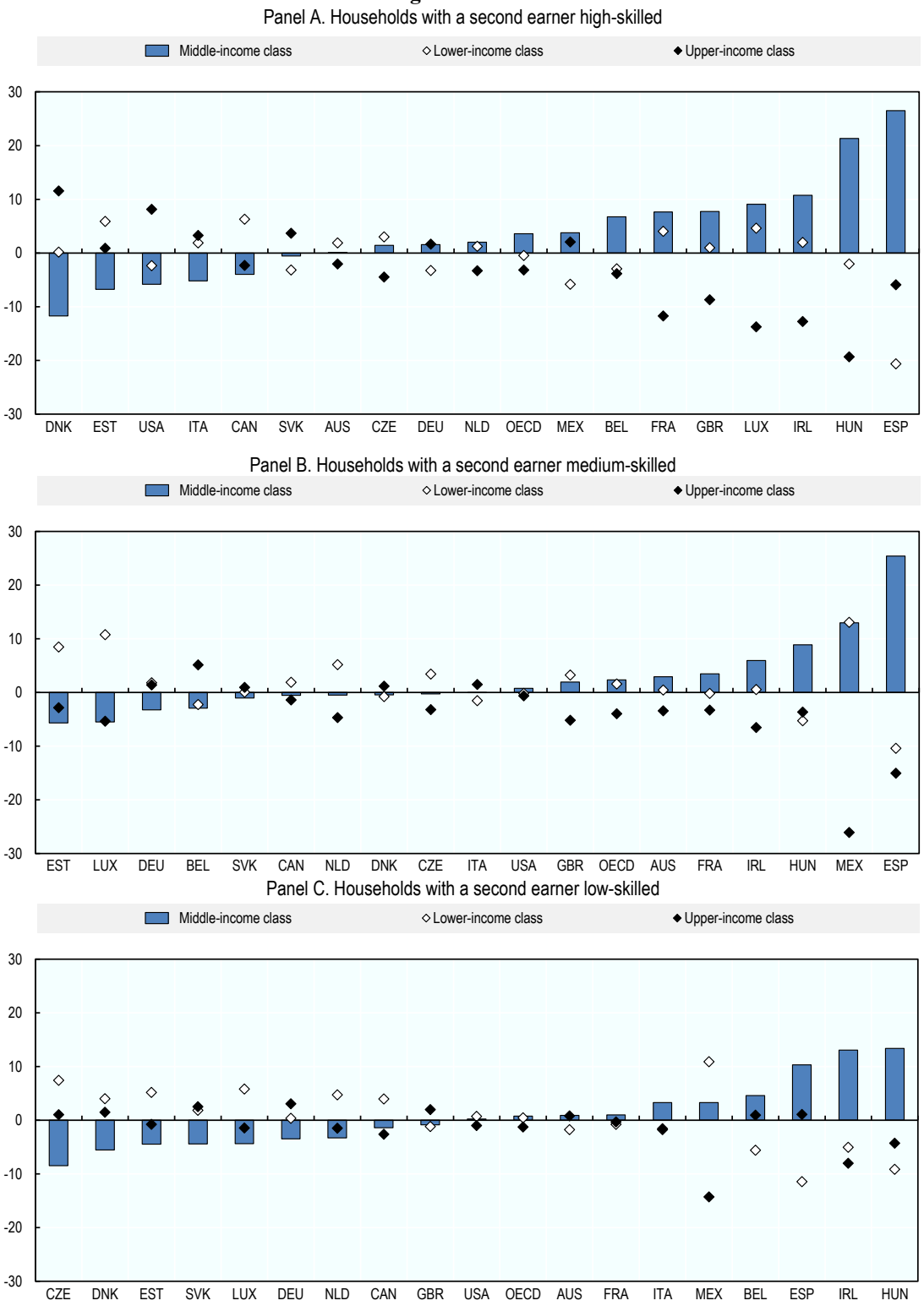
Figure 3.6. Dual-earner couples with at least one high-skill worker have fared relatively better



Note: Households with no working adults or with at least one retired person are excluded. See Box 1.1 for more information on the definition of skill groups and income classes.
Source: Authors' estimates. See Box 1.1 for more information.

[7] As described at length in the text, the analysis here focuses only on the changes in fortunes of couples with workers of different skill levels, but does not delve into the question as to whether the number of couples with workers of different skill levels has changed. Investigating this point – and more generally how changes in assortative matching have impacted the size and the composition of the middle class is a policy-relevant avenue for future research.

Figure 3.7. Changes in the distribution across classes of households with a secondary earner of a given skill level



Note: Households with no working adults or with at least one retired person are excluded. See Box 1.1 for more information on the definition of skill groups and income classes.
Source: Authors' estimates. See Box 1.1 for more information.

4. Conclusions

111. Using both individual-level and household-level data from across 18 OECD countries, this paper presents descriptive evidence on the link between the well-documented process of job polarisation and the size and composition of the middle-income household group. The analysis yields a number of new facts that provide important insights for the ongoing policy debate on the fortunes of the middle class across advanced countries.

112. The main result is that, contrary to what is often assumed, changes in the size of different occupations (i.e. job polarisation) have had a small impact on the share of working adults who belong to middle-income households. Instead, the observed changes in the share of workers in middle-income households are generally explained by changes in the propensity of different occupational groups to be in it, as the distribution of different occupational groups across income groups have changed significantly in recent times.

113. Hence, the generally modest variations in the share of workers in middle-income households mask two very significant changes for policy. First, the work composition of the middle-income class has changed substantially, with a shift towards high-skill occupations that is larger than that observed in the aggregate economy. On average, across the country considered, the share of workers in middle-income households who are in a high-skill occupation has increased from 35% to 47% between mid-1990s and the mid-2010s, while the share of those holding a middle-skill job has declined from 41% to 32%.

114. The second important policy implication is that occupations of different skill levels are increasingly failing to deliver the income status traditionally associated to them. The probability that a high-skill worker is in the upper-income class declined in the majority of countries. On average, the proportion of high-skill workers found in the upper-income class declined from one-quarter to one-fifth. Most middle-skilled workers are in middle-income households, but the probability that they are in the lower-income class has increased in 14 countries. In 12 countries, both low-skill and middle-skill workers have tended to move towards the lower-income class.

115. The analysis at the household-level also confirms this change in the relationship between occupational skill levels and household income. In particular, the presence of two earners is becoming less effective in achieving middle class status, as couples involving only low and middle skill workers have seen an increase in the probability of finding themselves in the lower income class.

116. Overall, therefore, the analysis highlights that some jobs increasingly fail to deliver on the promise of the relative income status traditionally associated with their skill level. These changes might help explain some of the social frustration that has been at the centre of the political debate in recent years. An important avenue for future research is how these changes relate to changes in the value of different educational levels.

References

Alichi, A., K. Kantenga and J. Solé (2016), "Income Polarization in the United States", *IMF Working Paper*, No. 16/121, IMF, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2882555 (accessed on 1 February 2018). [11]

Autor, D. (2015), "Why Are There Still So Many Jobs? The History and Future of Workplace Automation", *Journal of Economic Perspectives*, Vol. 29/3, pp. 3-30, http://dx.doi.org/10.1257/jep.29.3.3. [9]

Beaudry, P., D. Green and B. Sand (2016), "The Great Reversal in the Demand for Skill and Cognitive Tasks", *Journal of Labor Economics*, Vol. 34/S1, pp. S199-S247, http://dx.doi.org/10.1086/682347. [8]

Economist (2014), *Rise of the robots*, http://www.economist.com/news/leaders/21599762-prepare-robot-invasion-it-will-change-way-people-think-about-technology-rise?fsrc=scn/fb/pp/pe/riseofrobots. [15]

Economist (2010), "Economics focus", in *Economics focus: Automatic reaction*, http://www.economist.com/node/16990700. [14]

Elliot, L. (2017), *Robots will not lead to fewer jobs – but the hollowing out of the middle class*, The Guardian, https://www.theguardian.com/business/2017/aug/20/robots-are-not-destroying-jobs-but-they-are-hollow-out-the-middle-class (accessed on 11 September 2018). [2]

Kochhar, R. (2017), "Middle Class Fortunes in Western Europe", *LIS Working papers*, https://ideas.repec.org/p/lis/liswps/702.html (accessed on 1 February 2018). [5]

OECD (2019), *Under Pressure: The Squeezed Middle Class*, OECD Publishing, Paris, https://dx.doi.org/10.1787/689afed1-en. [12]

OECD (2017), *OECD Employment Outlook 2017*, OECD Publishing, Paris, http://dx.doi.org/10.1787/empl_outlook-2017-en. [1]

OECD (n.d.), *What are equivalence scales?*, http://www.oecd.org/els/soc/OECD-Note-EquivalenceScales.pdf. [13]

Pew Research Center (2015), *The American middle class is losing ground*, http://www.pewsocialtrends.org/files/2015/12/2015-12-09_middle-class_FINAL-report.pdf. [7]

Rose, S. (2016), "The Growing Size and Incomes of the Upper Middle Class", Urban Institute, https://www.urban.org/sites/default/files/publication/81581/2000819-The-Growing-Size-and-Incomes-of-the-Upper-Middle-Class.pdf (accessed on 1 February 2018). [10]

Vaughan-Whitehead, D. (2016), *Europe's disappearing middle class? : evidence from the world of work*, Edward Elgar Publishing, https://econpapers.repec.org/bookchap/elgeebook/17301.htm (accessed on 1 February 2018). [6]

Vaughan-Whitehead, D., R. Vazquez-Alvarez and N. Maître (2016), "Is the world of work behind middle-class erosion?", *Chapters*, pp. 1-61, https://ideas.repec.org/h/elg/eechap/17301_1.html (accessed on 31 January 2018). [4]

Yglesias, M. (2014), *Robots won't destroy jobs, but they may destroy the middle class*, Vox, https://www.vox.com/2014/8/23/6057551/autor-job-polarization (accessed on 11 September 2018). [3]