Chapter 3

Institutional and Policy Determinants of Labour Market Flows

Many new firms are created every year. At the same time, many existing firms expand, while others contract or even shut down. In the process, many jobs are created and workers are hired; even as many positions are suppressed and workers separate from their employers. Labour reallocation is an important driver of productivity growth, insofar as less productive firms tend to destroy more jobs and more productive ones to create more jobs. What determines cross-country differences in hiring and separation rates? Can policies enhance growth by removing barriers to labour reallocation across industries, firms and jobs? Drawing from internationally harmonised data, the chapter analyses the impact of policies and institutions on gross worker flows in order to better inform policy makers on the channels through which policies affect productivity. However, enhancing labour reallocation can have distributional effects insofar as those workers that lose their job usually suffer from substantial declines in earnings and working conditions, in particular during periods of contracting economic activity. What are the effects of different policies on the likelihood and costs of losing a job? The chapter also examines the impact of policies on the incidence of, and wage premia and losses associated with, different types of labour market transitions.

Introduction

A continuous reallocation of labour and other productive resources is the lifeblood of a market economy. New firms are created; existing firms expand, contract or shut down. Many new firms do not survive their first few years in the market, while other successful young businesses develop rapidly. In the process, large numbers of jobs are created and destroyed. At the same time, many individuals enter the market and fill new job vacancies, while others change jobs or leave employment. As documented by the *2009 OECD Employment Outlook*, each year more than 20% of jobs, on average, are created and/or destroyed, and around one-third of all workers are hired and/or separate from their employer.

Labour reallocation is an important driver of productivity growth, insofar as less productive firms tend to destroy more jobs and more productive ones create more jobs (OECD, 2009). More generally, a growing body of evidence suggests that the process of firm birth and death, as well as the reallocation of resources from declining to expanding businesses, contribute significantly to productivity and output growth (*e.g.* Griliches and Regev, 1995; Foster *et al.*, 2001; and Bartelsman *et al.*, 2009). However, the positive correlation between job flows and productivity growth by no means implies that all labour reallocation is efficiency-enhancing. While removing barriers to reallocation is likely to be consistent with the policy objective of increasing growth, one needs to be cautious in drawing conclusions from this simple correlation, insofar as the efficiency of labour reallocation may vary greatly and be affected by institutions. For example, a growing body of evidence suggests that countries that implemented partial reforms of employment protection legislation, whereby regulations on temporary contracts were weakened while maintaining stringent restrictions on regular contracts, have indeed experienced greater labour reallocation but also slower productivity growth (*e.g.* Bentolila *et al.*, 2008; Bassanini *et al.*, 2009).

Job and worker flows are very different across countries: in some countries annual job and worker reallocations are as large as 25% and 45%, respectively, of dependent employment. By contrast, in a number of other countries, less than 15% of jobs are created and/or destroyed, and about 25% of all workers are hired or separate from their employer in a given year. This suggests that country-specific policies and institutions are likely to play an important role in determining the level of job and worker reallocation. However, there is little cross-country comparative evidence on the way labour market institutions shape these flows, by and large because comparable data for many countries are scarce. By using harmonised data on hirings and separations at the industry level for a large number of countries, this chapter fills this gap, by analysing the role of a number of labour and product market institutions in shaping cross-country differences in labour reallocation. As some of these policies and institutions – namely employment protection, unemployment benefits and minimum wages – have already been found to affect productivity growth (*e.g.* OECD, 2007), this chapter aims at deepening the policy maker's understanding of the role of labour reallocation in accounting for the already documented links between these policies and institutions and long-run productivity performance.

A dynamic labour market nevertheless represents both an opportunity and a cost for workers. Some workers quit their jobs because they have decided to search for jobs that better match their skills and needs and are hired to fill new positions or to replace previous employees. In the process, these workers typically progress in their career and pay (*e.g.* Postel-Vinay and Robin, 2002; Connolly and Gottschalk; 2004; Contini and Villosio, 2007). But other workers are dismissed, either because of post suppressions or because their employers decided to replace them with other workers. For those who are dismissed or have been asked to leave, it may take time to find another job and, even when this is accomplished, the new job might not offer comparable pay (*e.g.* OECD, 2004), in particular in times of severe downturns as in the recent global crisis (see Chapter 1). For this reason, the chapter also traces out key distributional implications of productivity-enhancing labour market reforms through documenting their impacts on the transitions from job to job, the transitions from job to non-employment and the transitions from non-employment to jobs. In the same vein, the chapter also considers how institutions affect the wage premium/penalty associated to these transitions. However, available data only allow to analyse long-run structural relationships. Therefore the results must be seen as referring to a "normal" period of activity and their implications for periods of significant downturns, as in the recent 2008-09 crisis, remain unclear.

The chapter is organised as follows. Section 1 recalls a few stylised facts on different types of labour market transition. Section 2 examines the impact of policies and institutions on worker flows. Conclusions follow.

Main findings

- *The large cross-country variation in gross worker reallocation is associated with large cross-country variations in both job-to-job flows and flows between jobs and non-employment and* vice versa. Nevertheless, at the cross-country level, greater labour reallocation is associated with a lower incidence of long-term unemployment.
- *Large gross job and worker flows partially reflect better job opportunities available to workers* due to an enhanced job-matching process. Available evidence suggests that wage premia to job changes are positive and sizeable in many countries. *However, workers facing involuntary separations typically suffer from wage penalties at re-employment*, even if they do not experience spells of unemployment between jobs.
- *Stringent employment protection for regular contracts is estimated to have a large and statistically significant negative effect on worker reallocation.* As a result, differences in the degree of stringency of employment protection legislation explain between 20% and 30% of the difference in worker reallocation rates across countries. However, in periods of normal economic activity, *employment protection regulations affect mainly job-to-job transitions*, while transitions from jobs to non-employment are unaffected. But this finding might not hold during a jobs crisis, due to labour market congestion. A detailed look at the impact of different employment-protection provisions indicates that high severance pay, long trial periods and strict reinstatement rules strongly compress gross worker flows.
- Less stringent employment protection appears to be associated with greater wage premia in the case of a voluntary job change. Moreover, for those losing their jobs, the evidence suggests that flexibility-enhancing reforms of employment protection are unlikely to worsen wage penalties at re-employment. *However, these reforms might increase the fraction of workers experiencing involuntary job separations who will therefore suffer from a wage penalty at re-employment.*

- *Unemployment benefit generosity appears to have a positive impact on average gross worker flows*. A ten-percentage-point increase in the average net benefit replacement rate – a large reform from a historical perspective – would increase, on average, gross worker reallocation by about 1 percentage point.
- Employed workers are likely to benefit from generous unemployment benefits in the form of higher average wages, brought about, at least partially, by greater productivity growth. In addition, for those experiencing unemployment spells, adequate benefits sustain income during job search and might also promote better job matches, thereby mitigating the wage penalty at re-employment. This suggests that *the provision of adequate unemployment benefits*, if they are made conditional on strictly-enforced work-availability conditions and are part of a well-designed "activation" package to promote quick re-integration into employment, *could be part of a policy package geared at increasing labour reallocation and productivity* that also includes reforms of overly-strict employment protection.
- Among the other policies considered in this chapter, *anti-competitive product market regulations have a moderate depressing effect on labour reallocation*, at least in typically-regulated non-manufacturing industries, possibly due to their dampening impact on firm entry and exit. By contrast, *statutory minimum wages do not seem to have any sizeable effect on gross worker flows*.
- What are the lessons for the current labour market outlook that emerges from these results? *In a period of jobs crisis,* the fraction of workers losing their jobs in total separations tends to increase significantly. As many applicants compete for scarce job offers, these workers are likely to experience protracted unemployment spells and substantial wage penalties at re-employment. Under these circumstances, *it is important to put in place an adequate policy mix to sustain incomes during job search and support the transition towards new jobs*, in particular in countries with less stringent employment protection regulations, where separations tend to be higher.

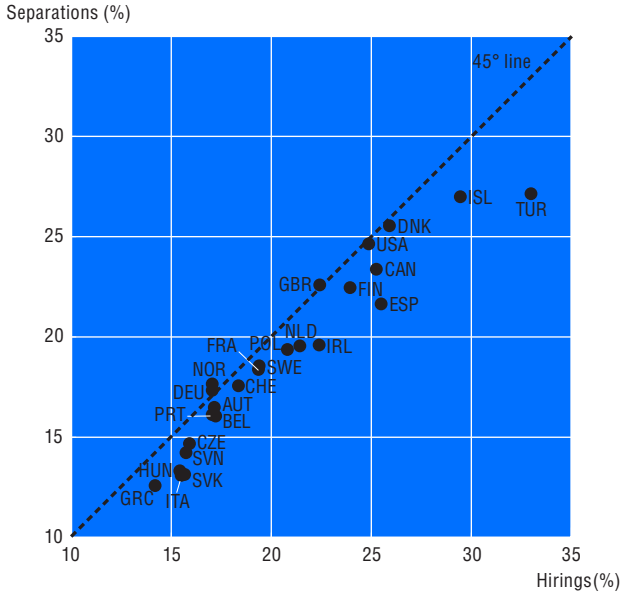
1. Cross-country differences in labour reallocation

Cross-country variation in gross job and worker flows is large

On the basis of harmonised data for 22 countries for the first half of the current decade, OECD (2009) highlighted that the cross-country variation of gross job and worker flows is very large, even after controlling for the characteristics of firms (such as industry affiliation, firm age and firm size) and workers (such as gender, age, and educational attainment). Figure 3.1 shows updated figures for gross worker flows, adjusted for industry composition,[1] for a larger number of countries and a longer time span (2000-07; see Box 3.1 for definitions, sources and data construction methodology). In countries such as Turkey, Iceland, Denmark, Spain, Canada or the United States, 25% or more employees were hired on average in each year, and a comparable percentage separated from their employer in the same period (Figure 3.1). By contrast, these flows were almost half as small in certain eastern and southern European countries.

While gross worker flows are in principle driven by both demand and supply factors, gross job flows are usually interpreted as reflecting essentially the dynamics of labour demand (see *e.g.* Davis and Haltiwanger, 1999; Pries and Rogerson; 2005; Haltiwanger *et al.*, 2008). But, the cross-country/cross-industry distributions of job and worker flows have been shown to be closely interrelated (see Box 3.1), while churning flows – that is, worker flows in excess of job flows – vary little across countries (see Bassanini and Marianna, 2009; Centeno

Figure 3.1. **Gross worker reallocation rates in OECD countries, 2000-07**



Note: Country averages of reallocation rates expressed in percentage of total dependent employment and adjusted for industry composition. Austria: 2002-07; Belgium: 2000-07; Canada: 2000-06; the Czech Republic: 2001-07; Denmark: 2000-06; Finland: 2000-07; France: 2000-06; Germany: 2000-06; Greece: 2000-05; Hungary: 2000-05; Iceland: 2002-07; Ireland: 2000-05; Italy: 2000-06; the Netherlands: 2000-07; Norway: 2000-04; Poland: 2004-05; Portugal: 2000-06; the Slovak Republic: 2002-06; Slovenia: 2002-07; Spain: 2000-05; Sweden: 2000-06; Switzerland: 2000-07; Turkey: 2007; the United Kingdom: 2000-07; and the United States: 2000-06.

Source: OECD estimates. See Annex 3.A1.

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Box 3.1. **Definitions, sources and accounting identities concerning gross worker flows**

In this chapter, *hirings* are defined as the number of workers who are with the firm at time *t*, but were not with it at time *t* – 1, and *separations* as the number of workers who were with the firm at *t* – 1, but not at *t*. *Total worker reallocation* is simply the sum of hirings and separations defined as above, while their difference is equal to *net* employment growth. At a greater level of aggregation (*e.g.* the industry or the whole economy) it is possible to define also *excess worker reallocation* as the difference between worker reallocation and the group's absolute net change in employment. This provides a useful measure of the number of hirings and separations that occur simultaneously, over and above the minimum necessary to accommodate net employment growth. Excess worker reallocation, thus, reflects the reshuffling of workers and jobs within the same group. In addition, *job creation* is defined as the employment growth at expanding firms and *job destruction* as the absolute value of employment contraction at declining firms.

To summarise, at any level of aggregation, the following identities can be written:

- Total worker reallocation = sum of hirings and separations between *t* – 1 and *t*.
- Excess worker reallocation = total worker reallocation – abs(net employment growth).
- Total job reallocation = sum of job creation and job destruction between *t* – 1 and *t*.
- Net employment growth = difference between hirings and separations between *t* – 1 and *t* = difference between job creation and job destruction between *t* – 1 and *t*.

Consistent with the literature (see *e.g.* Davis and Haltiwanger, 1999), all labour market flow measures from *t* – 1 to t are expressed here as rates and are calculated by dividing the flow totals by the average of employment in *t* – 1 and *t*.

Box 3.1. **Definitions, sources and accounting identities concerning gross worker flows** *(cont.)*

Except when otherwise specified, data used for this chapter are aggregated at the industry level from European and national labour force surveys, harmonised using large cross-country comparable national-account-based industry databases such as the *OECD STAN Database* and EU KLEMS. In practice, hiring rates at the industry level are obtained from job tenure data in labour force surveys, while separation rates are obtained by subtracting net employment growth rates from hiring rates, the former derived from STAN and KLEMS (see Annex 3.A1 for more details).

Industry-level data constructed for this chapter allow distinguishing between job-to-job transitions and transitions from, and to, non-employment. In this chapter, *job-to-job transitions* count workers that are in employment at both *t* and *t* – 1 but who changed employer between these two dates. By contrast, *job-to-jobless transitions* occur when a worker is in employment at *t* – 1 but not at *t*, and *vice versa* for *jobless-to-job* ones. As a consequence, for each industry and country, the hiring rate can be decomposed into *job-to-job* and *jobless-to-job hiring rates* – that is, the percentage ratios of the number of job-to-job and jobless-to-job transitions, respectively, concerning workers with an employer in that industry and country at time *t*, to the average of employment in *t* – 1 and *t* for the same industry and country. In the same way, it is possible to decompose the separation rate into *job-to-job* and *job-to-jobless separation rates*, except that information on the industry of the employer at *t* – 1 will be used. Job-to-job separations can be further decomposed into *same-industry* and *other-industry separations*, depending on whether industries at time *t* and *t* – 1 are the same or different, while job-to-jobless separations can be decomposed into *employment-quitting* and *employment-losing separations*, depending on whether they were voluntary or involuntary.[1]

Country (and industry) rankings in terms of job or worker flows have been shown to be very similar (OECD, 2009). In addition, for data aggregated at the country and industry level, a simple regression of total worker reallocation on total job reallocation (including a constant) gives a coefficient of 0.98, insignificantly different from unity. In other words, a one-percentage-point increase in job reallocation is associated with an equal increase of worker reallocation, with no increase in worker churning (Bassanini and Marianna, 2009). All this suggests that, to a large extent, job and worker flows can be used as substitutes in cross-country analysis and conclusions drawn on the basis of one type of data can be applied to the other. For this reason, and for reasons of data availability, this chapter focuses essentially on worker flows.[2]

1. Unfortunately, available data do not allow distinguishing between voluntary and involuntary job-to-job separations.
2. See OECD (2009) for further discussion of these concepts and definitions.

et al., 2009). Churning flows have also been shown to vary little across firms (Burgess *et al.*, 2001; Davis *et al.*, 2006; Centeno *et al.*, 2009). This suggests that, by and large, the country rankings highlighted in Figure 3.1 in terms of gross worker flows reflect country rankings in terms of gross job flows. As a consequence, cross-country differences in both worker and job reallocation are likely to be mainly driven by the dynamics of labour demand.

The magnitude of gross job and worker flows is not systematically related to employment performance…

There is no evidence that increasing worker reallocation in the labour market is associated with changes in employment in the short run (see *e.g.* Baldwin *et al.*, 1998; Burgess *et al.*, 2000; Centeno *et al.*, 2009; OECD, 2009). Moreover, there does not seem to be

any compelling evidence that the cross-country distribution of gross job and worker flows has any correlation with unemployment rates (see *e.g.* Blanchard and Portugal, 2001; and Wolfers, 2010). Nevertheless, there is much evidence that flows into and out of unemployment are strongly related to unemployment levels (see for example Petrongolo and Pissarides, 2008; Elsby *et al.*, 2008; Boeri and Garibaldi, 2009).

… but gross worker reallocation tends to be positively associated to productivity growth…

By contrast, there is quite a lot of evidence that gross job reallocation and productivity growth are positively correlated. In particular, several single-country studies based on dynamic accounting decompositions have shown that jobs tend to be reallocated from firms with lower labour productivity to firms with higher labour productivity (see *e.g.* Griliches and Regev, 1995; Haltiwanger, 1997; Foster *et al.*, 2001, 2006; Disney *et al.*, 2003; Baldwin and Gu, 2006; Bottazzi *et al.*, 2010). This result has been confirmed by multi-country studies (*e.g.* Bartelsman *et al.*, 2009), and appears to be even stronger when efficiency levels are measured through multi-factor productivity – MFP hereafter (*e.g.* Brown and Earle, 2008). In addition, the observed association between efficiency levels and labour reallocation does not appear to be due to firm heterogeneity (OECD, 2009). As a result, aggregate productivity growth tends to be greater, the greater the labour reallocation.

… although this does not mean that greater flows are always synonymous with greater efficiency

This observation, however, does not imply that greater labour reallocation is always conducive to greater productivity growth in the long-run. For example, an excessive degree of reallocation can discourage the accumulation of firm-specific human capital, thereby hampering firm-level productivity growth. In particular, a growing body of evidence suggests that productivity growth and innovation tend to be smaller in countries where labour market flexibility is reached through an overwhelming use of temporary contracts while maintaining compressed reallocation rates of workers on open-ended contracts (see for example, Bassanini *et al.*, 2009; Dolado and Stucchi, 2008; Griffith and Macartney, 2010). Indeed, the evidence suggests that temporary workers are less likely to participate in job-related training (OECD, 2002; Albert *et al.*, 2005; Bassanini *et al.*, 2007; Draca and Green, 2004), are more prone to workplace accidents (Guadalupe, 2003) and tend to provide less effort when the probability of conversion of their contract into open-ended relationships is low (Dolado and Stucchi, 2008), although they might be more motivated when the latter is high (Engellandt and Riphahn, 2005).

On average, a dynamic labour market partially reflects better job opportunities…

Large gross job and worker flows partially reflect better job opportunities available to workers. By accepting job offers that better match their skills and needs, many workers quit their existing jobs voluntarily for new, often better paid, positions (*e.g.* Postel-Vinay and Robin, 2002; Connolly and Gottschalk, 2004; Contini and Villosio, 2007). For example, for 13 countries and the period 1995-2001,[2] Table 3.1 shows cross-country comparable micro-econometric estimates of the wage premium to changing jobs obtained on the basis of longitudinal household data and controlling for individual heterogeneity (see Box 3.2 for the methodology). While estimates are insignificant in one-third of the countries when focusing on all job changes, wage premia are positive and significant in all the others and

Table 3.1. **Estimated wage premia to job change, 1995-2001**

	All job changes		Voluntary job changes, business sector	
	Wage premium	t-stat	Wage premium	t-stat
Austria	. .		3.43*	*1.76*
Belgium	. .		. .	
Denmark	. .		2.38**	*2.19*
Finland	3.94***	*3.05*	6.41***	*3.07*
France	. .		. .	
Germany	2.94***	*3.37*	. .	
Greece	. .		5.25**	*2.26*
Ireland	9.26***	*6.06*	12.40***	*6.35*
Italy	3.45***	*3.17*	7.28***	*3.90*
Netherlands	3.50***	*4.00*	2.09*	*1.85*
Portugal	3.43***	*3.45*	6.40***	*3.86*
Spain	4.02***	*4.69*	7.10***	*4.37*
United Kingdom	5.13***	*6.31*	4.03***	*3.66*

Note: Percentage-point estimated differences between wages at the new and previous jobs, based on wage and salary employees only.
*, **, ***: statistically significant at the 10%, 5% and 1% levels, respectively.
. .: statistically insignificant estimate (not reported).
Source: OECD estimates.

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Box 3.2. **Wage premia to job change: estimation method**

For the purpose of this chapter, wage premia to job changes were estimated using individual longitudinal data from the European Community Household Panel (see Annex 3.A1 for more details on data description). The following specification was fitted to the data:

$$\log w_{icjt} = X_{icjt}\beta + \gamma_i m_{icjt} + \eta_{ct} + \eta_{cj} + \eta_i + \varepsilon_{icjt}$$

where w is the gross hourly wage of worker i in country c and industry j at time t, m is a variable (that will be called counter hereafter) that increases by 1 each time a worker change employer, X stands for a vector of additional controls, the ηs represent individual, country-by-time and country-by-industry fixed effects (estimated by including the corresponding one or two-dimensional dummies in the specification), ε is the standard error term and β and γ are parameters to be estimated. The parameter of interest is γ that is assumed to be country-specific in Table 3.1 and represents the wage premium to job change. In Figure 3.4, in order to provide a more efficient estimate of the average wage premium, this parameter is assumed to be homogeneous across countries. As the equation is estimated only if the individual is in employment, the average wage premium includes also the average wage loss at re-employment, but earning losses during unemployment spells are not included.

In order to avoid that the acquisition of new diplomas confounds the estimate of the wage premium, when an individual increases his/her educational attainment, a new individual fixed effect is applied. As a result, the estimated wage premia are net of the effect of simultaneous changes in educational attainment. The same treatment applies to individuals with missing observations, for whom a new fixed effect is generated for all years above the one with missing values. As the main interest is on the effect of different types of separations, industry affiliation is based on that of the previous employer. Other

Box 3.2. **Wage premia to job change: estimation method** *(cont.)*

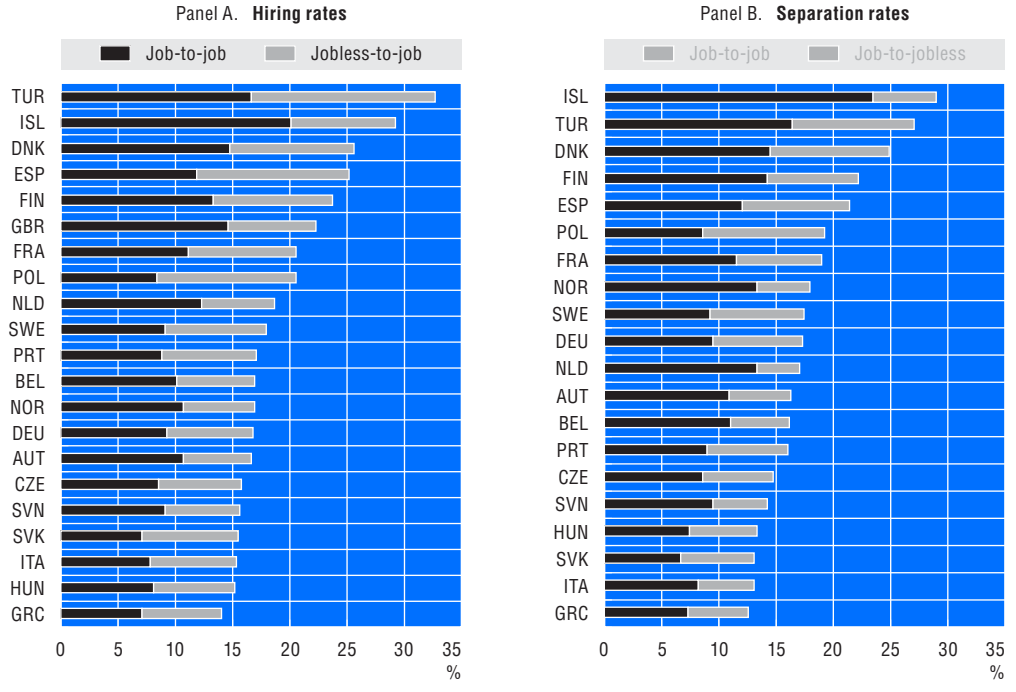
controls are kept to a minimum in order to preserve comparability with worker-flow statistics presented in this chapter and include age classes, a public sector dummy and a temporary contract dummy.

Wage premia are also estimated for voluntary and involuntary separations. In this case, two counters m, one for each type of transition, are simultaneously included in the same equation. The same occurs when the premium is decomposed into a premium to job-to-job transition and a penalty at re-employment to job-to-jobless transition.

in a few more when focusing on voluntary job changes.[3] A 3-4 percentage-point premium appears to have been the norm in most cases in the period under study, and premia are usually larger when only voluntary job changes are considered.

For the unemployed, or those with limited attachment to employment, a more dynamic labour market is also likely to provide better access to jobs (see *e.g.* Petrongolo and Pissarides, 2008). Figure 3.2 in fact shows that, on average, about 44% of all hires in one year concerns workers that were not in employment at the beginning of the year – jobless-to-job hires, according to the definition in Box 3.1.[4] Moreover, the cross-country variation in hiring rates is strongly associated to that of the jobless-to-job transition rate – that is, to the

Figure 3.2. **Job-to-job, jobless-to-job and job-to-jobless flows, 2000-07**



Note: Country average rates expressed in percentages and adjusted for industry composition. Differences from Figure 3.1 are due to missing values for certain years in certain countries. Austria: 2002-07; Belgium: 2000-07; Canada: 2000-06; the Czech Republic: 2001-07; Denmark: 2000-06; Finland: 2000-07; France: 2000-06; Germany: 2000-06; Greece: 2000-05; Hungary: 2000-05; Iceland: 2002-07; Ireland: 2000-05; Italy: 2000-06; the Netherlands: 2006-07; Norway: 2000-04; Poland: 2004-05; Portugal: 2000-06; the Slovak Republic: 2002-06; Slovenia: 2002-07; Spain: 2000-05; Sweden: 2000-06; Switzerland: 2000-07; Turkey: 2007; the United Kingdom: 2000-07; and the United States: 2000-06.

Source: OECD estimates. See Annex 3.A1.

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pace at which non-employed individuals get (or get back) a foothold into employment.[5] As a result, there is a negative association across countries between gross worker reallocation and the percentage of the labour force that has been unemployed for more than one year.[6]

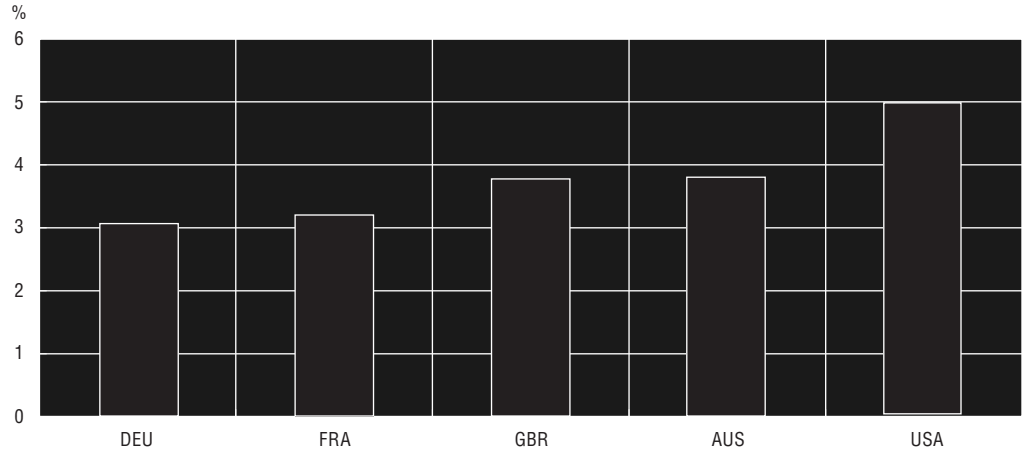
In practice, the empirical evidence suggests that, in normal times, workers take advantage of a more dynamic labour market by securing better matches between their skills and aspirations and employers' needs; this better matching allows them to progress in their careers. But, more generally, workers are likely to benefit in the long-run from greater reallocation when the latter enables faster productivity growth, to the extent that productivity gains are shared with workers through higher real wages. There is indeed some, albeit limited, empirical evidence suggesting that job flows and wage growth are correlated. For example Faberman (2002) shows that US metropolitan areas with larger job flows tend to have greater growth rates of average wages, while Belzil (2000) finds a positive impact of job creation on wages using Danish matched employer-employee data, although this effect is weaker at longer tenure.

… but those who are dismissed or are forced to leave might find it difficult to find an equally suitable job

Not all workers benefit from the dynamism of the labour market in the same way, however. Workers who separate from their employer against their will are likely to experience difficulties in finding a job with comparable pay and working conditions. This is particularly likely to be the case during a deep recession and early phase of the subsequent recovery, due to congestion of the labour market brought about by the soaring number of unemployed and job applicants (see Chapter 1).

Comparative data on dismissals are scarce. Yet, looking at the five countries for which they are available, it appears that, on average, about 5% of dependent workers are dismissed each year in high-reallocation countries – such as the United States – against about 3% in middle-to-low reallocation countries – such as Germany (Figure 3.3). In addition, it is possible to have a rougher but more extensive assessment of this relationship, by looking at those who separate from their employer in a given year and are

Figure 3.3. **Dismissal rates in selected countries, 1995-2007**



Note: Country average rates expressed in percentages and adjusted for industry composition. Australia: 1995-2001; France: 2006-07; Germany: 2003-07; the United Kingdom: 1997-2005; the United States: 1996-2006.

Source: OECD (2009), *OECD Employment Outlook*, OECD Publishing, Paris.

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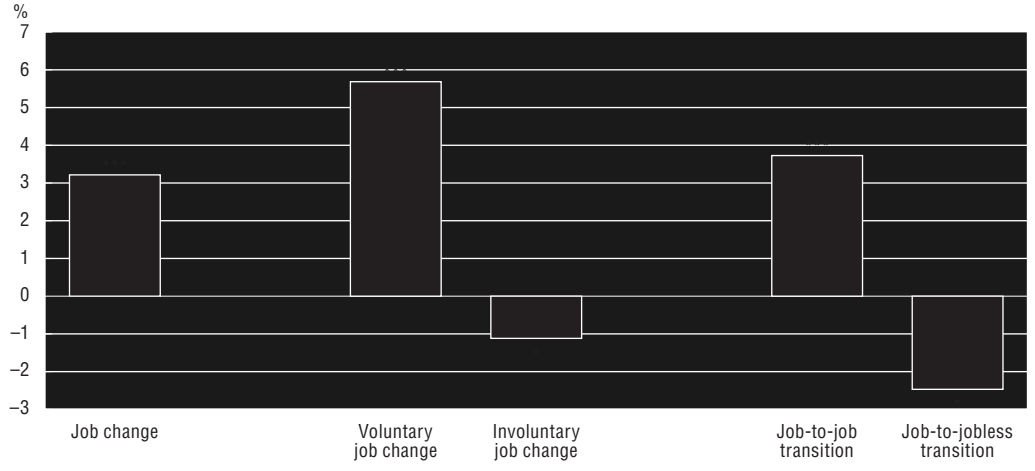
still jobless at the end of that year – job-to-jobless separations, according to the definition in Box 3.1. In fact, even though these separations include also voluntary quits leading to retirement or other types of voluntary withdrawal from the labour market, they are likely to be correlated with the rate of involuntary separations.[7] Perhaps not surprisingly, job-to-jobless separations tend to be more frequent in countries with larger average separation rates (*cf.* Panel B of Figure 3.2). Overall, this evidence suggests that higher rates of reallocation bring about larger shares of employees who are constrained to separate involuntarily from their employer in a given year.

Displaced workers typically suffer from substantive losses in terms of post-displacement earnings and working conditions. Several US studies argue that displaced workers are more likely to end up in precarious jobs and, in general, tend to have much smaller earnings, once re-employed (see *e.g.* Podgursky and Swaim, 1987; Farber, 1999, 2003). Moreover, Kletzer and Fairlie (2003) show that significant wage losses can persist for up to five years after displacement. In particular, immediate wage losses are greater in the case of older workers with long pre-displacement tenure, but young workers suffer from displacement in terms of reduced wage growth prospects. Post-displacement wage and consumption losses are also observed for many European countries and Canada (*e.g.* Burda and Maertens, 2001; OECD, 2003; Houle and van Audenrode, 1995; Browning and Crossley, 2008).[8] These effects persist even when sorting and selective mobility are taken into account (von Wachter and Bender, 2006).[9] The negative impact of job loss appears to be particularly large if it leads to protracted unemployment spells (Ruhm, 1991; Gregory and Jukes, 2001) and in the case of white collars (Schwerdt *et al.*, 2010).

Overall, the empirical literature suggests that those workers who are dismissed or forced to leave suffer from significant wage and welfare losses. Figure 3.4 graphically highlights this conclusion. For the same 13 countries and years for which wage premia are presented in Table 3.1, the figure shows that, in the period under study (1995-2001), while

Figure 3.4. **Average wage premia to job change, 1995-2001**



Note: Percentage-point estimated average differences between wages at the new and previous jobs (see Table 3.1 for the list of countries), based on wage and salary employees only. Voluntary job changes occur when the reason to stop the previous job is that the worker obtained a better/more suitable job. An involuntary job change occurs when the reason why the worker stopped the previous job was: obliged to stop by employer or end of temporary contract.
*, ***: statistically significant at the 10% and 1% levels, respectively.

Source: OECD estimates.

StatLink http://dx.doi.org/10.1787/888932292916

the average wage premium was almost 6 percentage points in the case of a voluntary job change, in the case of an involuntary separation wages after re-employment were, on average, about 1 percentage point smaller than what they would have been if the job match had not been destroyed. In addition, and consistent with the "scarring" effect of unemployment, the wage loss at re-employment was about twice as large in the case of job-to-jobless transitions, no matter whether voluntary or involuntary.

2. What role for labour market policies and regulations?

By affecting labour reallocation, labour market policies and regulations can raise productivity and wage growth…

What determine cross-country differences in gross job and worker flows? Can policies enhance growth by removing barriers to labour reallocation across industries, firms and jobs? The large cross-country variation in the rates of labour reallocation suggests that national policies and institutions play a key role in shaping the patterns of gross job and worker flows in OECD countries. Moreover, to the extent that, cross-country differences in worker reallocation are essentially due to differences in job reallocation, one can expect that labour reallocation will be particularly affected by those policies that economic theory suggests as likely to affect labour demand. OECD (2007) has already analysed the impact of a number of these policies on productivity growth (including employment protection, unemployment benefit generosity and minimum wages) by estimating growth models on industry-level data for a large number of countries, using a difference-in-difference identification strategy. However, the channels through which policies and institutions affect growth remain, by and large, a black box. In particular, although economic theory suggests that the enhancing or dampening effect that policies and institutions have on labour reallocation is likely to be one of the main channels through which they affect growth, there is limited cross-country evidence on their impact on labour reallocation.[10] The remainder of the chapter aims at shedding some light on this issue, by estimating the impact of these policies on worker reallocation, using mainly a difference-in-difference strategy on industry-level data (Box 3.3). This section focuses essentially on those that were found to have a significant impact on productivity growth in previous OECD work – that is, as noted above, employment protection, unemployment benefit generosity and the minimum wage (see OECD, 2007), although other labour market institutions are likely to affect labour reallocation.[11] For ease of presentation, empirical findings will be discussed separately for each policy, even though the various effects are estimated simultaneously in a multivariate framework.

The empirical literature suggests that about one-third of job creation and an almost equal amount of job destruction are due to the process of firm entry and exit (see OECD, 2009). In addition, surviving firms are characterised by high rates of employment growth in the first few years following entry (see *e.g.* Bartelsman *et al.*, 2005). This suggests that barriers to entrepreneurship and, more generally, barriers to product market competition are also a key determinant of labour reallocation. Much OECD work has analysed the relationship between anti-competitive product market regulation and productivity growth, reaching the conclusion that lifting barriers to competition is growth-enhancing (*e.g.* OECD, 2003). For these reasons a separate sub-section will also look at the impact of these regulations on gross worker flows as one of the possible channels through which deregulation affects productivity.

Box 3.3. **Estimating the effect of policies on labour reallocation: model specification**

OECD (2009) showed that gross worker flows vary dramatically across industries. Estimating the relationship between labour market policies and worker reallocation through standard cross-country/time-series techniques can therefore be quite misleading as changes in overall labour reallocation might be affected by the evolution of the industry composition of each country. In addition, available time-series are short, which would suggest caution in interpreting results based on time-series variation. Moreover, as it is almost impossible to include in the empirical analysis a full list of all aggregate policies and institutions that are likely to affect gross worker flows, standard cross-country/time-series estimates are likely to suffer severely from omitted-variable bias. Last but not least, the possibility of reverse causation is likely to confound the interpretation of certain policies, notably employment protection and unemployment benefits. In fact, when countries are hit by negative shocks, workers may well lobby for more generous unemployment insurance, while firms might lobby to relax dismissal regulations.

For the purpose of this chapter, the effects of employment protection, unemployment benefits and minimum wages on gross worker flows have been estimated using a reduced-form difference-in-difference model on industry-level data. As the time-series dimension of the data is short and affected by measurement error, this strategy will be mainly applied to averaged data, thereby suppressing the time dimension. However, most of the results are replicated using time-series variation as a sensitivity exercise (see Bassanini *et al*., 2010, for full details). This approach is based on the assumption that the effect of particular policies on gross job flows is greater in industries where the policy is more likely to constrain firm behaviour – hereafter called "policy-binding industries". For example, employment protection is more likely to be binding in industries where the propensity to make staff adjustments on the external labour market is high. If firms need to lay off workers to restructure their operations in response to changes in technologies or product demand, high firing costs are likely to slow the pace of reallocation of resources. By contrast, in industries where firms can restructure through internal adjustments, changes in employment protection can be expected to have a more limited impact on labour reallocation.

This difference-in-difference estimation strategy has the advantage that it controls for policies or institutions that influence gross worker flows in the same way in all industries. More precisely, all factors and policies that can be assumed to have, on average, the same effect on gross worker flows in policy-binding industries as in other industries can be controlled for by country dummies. In practice, the following specification is estimated:

$$REAL_{cj} = X_{cj}\beta + \delta B_j POL_c + \eta_c + \eta_j + \varepsilon_{cj} \qquad [A]$$

where *REAL* stands for the gross worker flow rate – used as dependent variable – in country *c* and industry *j*, *B* is a industry-specific and country-invariant variable (called benchmark measure hereafter) that measure the likelihood that a policy *POL* be binding,* *X* stands for a vector of additional controls (which can include other policies and institutions interacted with *B*), the ηs represent country and industry fixed effects (estimated by including the corresponding one-dimensional dummies in the specification), ε is the standard error term and β and δ are parameters to be estimated. The parameter of interest is δ. The sign of δ provides an indication of the direction of direct demand effects – that is the partial-equilibrium effect on gross worker flows due to the behavioural response of firms in reaction to a change in *POL* – if it is assumed, as done in this chapter (see above), that these effects are larger in policy-binding industries than in other industries – that is, assuming

Box 3.3. **Estimating the effect of policies on labour reallocation: model specification** *(cont.)*

that these effects are larger, the higher the value of *B*. For the average industry, it is then possible to derive a quantitative estimate of the direct demand effect of the policy by simply multiplying δ by the average value of *B*, if it is further assumed that there are no direct effects in a hypothetical industry whose benchmark measure *B* would be equal to 0. Quantitative estimates presented in this chapter are based on this assumption.

The disadvantage of this difference-in-difference approach is that it might be difficult to derive the aggregate effect of those policies that are likely to affect worker flows by affecting both demand and supply simultaneously, or where general equilibrium effects can offset direct (partial equilibrium) demand effects (such as in the case of unemployment benefits). For that reason, the analysis is complemented by a more standard cross-country/time-series analysis on annual data. As already mentioned, the latter type of analysis, however, has the disadvantage of being based on more noisy data and short time series. Nevertheless one can draw relatively robust conclusions from the consistency of results from difference-in-difference and cross-country/time-series experiments. In the case of cross-country/time-series regressions, the following general specification is estimated:

$$REAL_{cjt} = X_{cjt}\beta + \gamma POL_{ct} + \delta(B_j - \overline{B})POL_{ct} + \eta_c + \eta_{jt} + \varepsilon_{cjt} \qquad [B]$$

where *B* has been demeaned so that γ captures the general-equilibrium within-industry effect of the policy *POL* for the average industry (a bar over a variable indicates its global sample mean). If general equilibrium effects, over and above direct, partial-equilibrium effects, are minor, one would expect the estimate of γ to be close to that of δ*B* in equation [A].

In the case of product market regulation, however, the relevant provisions are also industry-specific and a more standard regression approach, including country-by-time dummies to control for aggregate institutions as in the equation above, appears preferable. OECD industry-specific indicators of the degree of stringency of anti-competitive regulation are available only for five non-manufacturing industries (energy, retail trade, transports, communications, and professional services) for all countries. Restricting the attention to these industries for available years would result in an excessively small sample, given the short available time-series for the worker reallocation data. By contrast, after the implementation of the European Single-Market Programme (SMP) in the early 1990s, before-enlargement European Union countries share essentially the same regulations in manufacturing, including the same trade barriers, except for economy-wide provisions applying to all industries (such as administrative barriers to start-ups). As suggested by Bassanini and Brunello (2010), it is therefore possible to enlarge the sample to manufacturing industries for these countries, by setting regulation equal to an arbitrary value in manufacturing, provided that industry-by-time and country-by-time dummies are included, the former to control for industry-specific regulations applying to all countries in the sample (such as trade barriers) and the latter for country-specific regulation (applying to all industries).

* For example, in the case of employment protection *B* could be the US worker reallocation rate of each industry, to proxy for the natural propensity of industries to adjust on the external labour market in the absence of regulations. Note, however, that in order to avoid endogeneity biases, *B* must not be affected by the level of the policy *POL* in each country. It must therefore be country-invariant and industry-specific.

… but distributional consequences of these policies must be taken into account

As discussed in the previous section, however, enhancing labour reallocation can have distributional effects insofar as those that are forced to leave a job usually suffer from substantive declines in earnings and working conditions, in particular during periods of contracting economic activity (see Chapter 1). Examining the effect of different reforms on the likelihood and cost of losing a job is therefore necessary to guide the selection of the right policy mix by decision makers. For this purpose, this chapter will also analyse the impact of policies on different types of transitions, exploiting the advantage of using harmonised data on gross worker flows (see Box 3.1), and discuss the effect of policies on wage premia and wage losses following different types of transitions.

2.1. Employment protection

Economic theory predicts that strict employment protection should reduce worker flows…

There is a large theoretical literature that looks at the impact of firing restrictions on labour flows with, by and large, consensual predictions. In the presence of dismissal restrictions, firms have an incentive to reduce both job creation and destruction, with an ambiguous effect on average employment levels. Moreover, if temporary contracts are less costly than open-ended contracts, employers will substitute temporary for regular workers, with greater worker turnover (see Box 3.4).

… and the burgeoning empirical literature points in the same direction…

There are a large number of country-specific studies that investigate the impact of EP legislation and jurisprudence on job flows on the basis of micro data. Autor *et al.* (2007) study the impact of the adoption of wrongful-discharge protection norms by state courts in the United States on several performance variables constructed using establishment-level data. By using cross-state differences in the timing of adopting stricter job security provisions, they find a negative effect of these provisions on job flows and firm entry. Using Italian firm-level data, Boeri and Jimeno (2005) exploit exemption clauses exonerating small firms from job security provisions. Their estimates confirm a significant effect of employment protection on job turnover and job destruction in particular. Similar findings are obtained by Schivardi and Torrini (2008), using an Italian matched employer-employee dataset, and by Kugler and Pica (2008), who exploit an Italian reform that in 1990 increased firing restrictions for small firms. Marinescu (2009) exploits a 1999 British reform that reduced the trial period for new hires from 24 to 12 months of tenure, thereby directly affecting only employees within this window. She finds that the firing hazard for these employees decreased by 26% with respect to that of workers with two to four years of tenure. Moreover, the risk of job loss of new hires with less than one year of tenure also decreased by 19%, which is consistent with more selective recruitment practices. Kugler *et al.* (2010) study the effects of a 1997 Spanish reform, which lowered dismissal costs for older and younger workers, and find that it was associated with a relative increase in worker flows for these groups. Finally, Venn (2010) analyses the impact on hirings of a recent Turkish reform of dismissal costs that applies differently to small and large firms, and reports large negative effects, especially for workers in the formal sector.

Box 3.4. **Employment protection and workers' flows: theory**

There is a large theoretical literature that looks at the impact of firing restrictions on labour flows with, by and large, consensual predictions. The rationale of dismissal regulations is that financial market imperfections might limit the ability of risk-averse workers to get insurance against dismissal (see *e.g.* Pissarides, 2010). However, by imposing implicit or explicit costs on the firm's ability to adjust its workforce to optimal levels, employment protection (EP hereafter) may inhibit efficient job separations and, indirectly, reduce efficient job creation (*e.g.* Mortensen and Pissarides, 1994). In principle, inefficiencies implied by firing regulations can be offset by private payments, wage adjustments or the design of efficient contracts (Lazear, 1990). However, wage rigidities, financial market imperfections or uncertainty about the future of the firm may prevent the effective operation of these channels. Standard equilibrium models of the labour market such as those of Nickell (1978), Bentolila and Bertola (1990) and Bertola (1990) describe firms' optimal behaviour in the presence of positive firing costs and show that the best strategy for firms is to reduce both job creation and destruction, with an ambiguous effect on average employment levels. Nevertheless, stricter EP implies a slower adjustment towards equilibrium employment levels. Search and matching models such as those of Garibaldi (1998) and Mortensen and Pissarides (1999) come to similar conclusions about job mobility being negatively affected by EP.

The theoretical analysis of the effect of regulation on temporary contracts is more straightforward. If the use of temporary contracts is liberalised while maintaining strict EP regulations for open-ended contracts, firms will react by substituting temporary for regular workers, with no long-run effect on employment, due to the smaller cost involved with the termination of the employment relationship at the end of a temporary contract (see *e.g.* Boeri and Garibaldi, 2007; Bentolila *et al.*, 2008). This also implies that the effect of regulation on temporary contracts cannot be seen in isolation, but it is conditional to the degree of stringency of EP for regular contracts. In the presence of protected insiders, covered by job security provisions, those under temporary contracts (often youth and other disadvantaged groups) will bear the main burden of employment adjustment (Saint Paul, 1996).

… although it is not always clear to what extent estimated effects are general and robust

In contrast with these findings, a few micro studies find no impact of dismissal regulations on job or worker flows. Insignificant effects are found by Bauer *et al.* (2007), who look at changes of small-firm exemption thresholds on worker turnover using German matched employer-employee data. Similarly, Venn (2010) looks at the effect of a recent threshold increase for small firms in Australia and finds no impact on hiring, firing or working hours, possibly because employment protection rules in Australia were already among the least strict in the OECD prior to the reform. The small economic significance of certain specific exemptions perhaps could also explain why exemptions from procedural requirements for dismissal have not been found to have a significant effect on hiring or firing in exempted firms in Portugal (Martins, 2009) and Sweden (von Below and Thoursie, 2010).

Micro-studies can be complemented by cross-country studies, in particular to the extent that differences in the type of microeconomic reforms limit the comparability of their findings. Few studies look at the impact of employment protection on labour reallocation from a multi-country perspective and they mainly focus on gross job flows. Boeri and Garibaldi (2009) estimate an aggregate cross-country/time-series regression

model on a small aggregate panel for 13 European countries covering the 1990s and find a negative impact of employment protection for temporary contracts on job-to-job transitions but no impact of provisions for regular workers. Gomez-Salvador *et al.* (2004) estimate the effect of different degrees of stringency of employment protection legislation using a classical cross-country/time-series regression analysis based on European firm-level data and find a negative effect on job reallocation controlling for the effect of other labour market institutions. On the same data, Messina and Vallanti (2007) find that strict employment protection significantly dampens job destruction over the cycle with mild effects on job creation. The negative impact of employment protection on job reallocation, job creation and job destruction is found to be larger in industries where total employment is contracting and where firms cannot achieve substantial reductions in employment levels purely by relying on voluntary quits.

As discussed in Box 3.3, standard cross-country/time-series studies that try to identify the effect of aggregate policies on labour reallocation through over-time variation are likely to suffer from endogeneity and omitted-variable biases. More relevant for this chapter, Micco and Pages (2006) and Haltiwanger *et al.* (2008) use a difference-in-differences estimator on a cross-section of industry-level data for more than 15 countries. They find that the negative relationship between layoff costs and job flows is more negative in industries with greater propensity to reallocate labour (proxied by the US reallocation rates), that is where it can be expected that EP effects are, if any, stronger. However, their samples include only few OECD countries, with data coming from different national sources,[12] so that it is difficult to generalise their result to the OECD as a whole. Equivalent results are obtained by Cingano *et al.* (2010), who apply a similar difference-in-differences methodology on firm-level data for 14 European countries, except that they use an estimate of the predicted job turnover that would occur in the absence of employment protection to identify the industry specific reallocation propensity.[13] Yet, their data exclude job reallocation due to entry and exit of firms.[14] Besides, their results become insignificant if France is excluded from the sample or if UK reallocation rates rather than predicted values are used to classify industries.

There is less – albeit more consensual – evidence on the effects of regulation for temporary contracts, perhaps because its effects are more straightforward. Kahn (2010) uses longitudinal microdata for nine European countries and finds that recent policy reforms making it easier to create temporary jobs on average raised the probability that a worker will be on a fixed-term contract. However, he finds no evidence that such reforms increased overall employment: they rather appear to have encouraged substitution of temporary for permanent work. In a similar vein, several studies focus on major Spanish reforms in the early 1980s that liberalised temporary contracts without changing dismissal costs for regular contracts and find, in general, that this led to a very large increase of fixed-term contracts and a reduction in employment on permanent contracts (see *e.g.* Bentolila *et al.*, 2008; Aguirregabiria and Alonso-Borrego, 2009). Finally, several papers find that the difference in the cost of adjusting the stock of workers on different types of contract explains both the share of temporary workers and their relative volatility (see, for example, Goux *et al.*, 2001). This suggests that, ceteris paribus, stringent regulation on regular contracts should encourage the use of temporary contracts, a prediction which is confirmed by the literature (see *e.g.* OECD, 2004; Pierre and Scarpetta, 2004; Boockmann and Hagen, 2001).

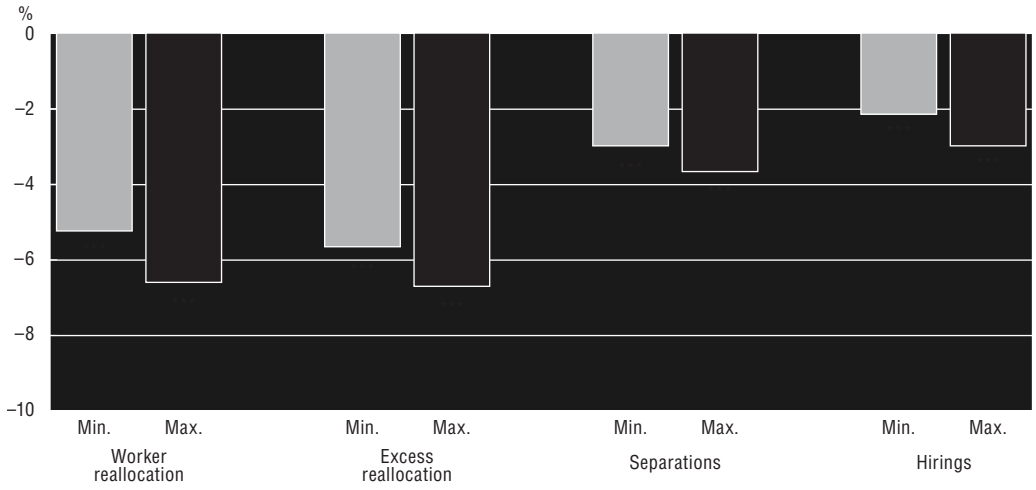
Firing restrictions are estimated to have a large negative impact on gross worker reallocation…

For the purpose of this chapter, the impact of EP for regular contracts (including additional restrictions for collective dismissals) on gross worker flows is estimated using the difference-in-difference procedure described in Box 3.3, for a sample of 24 business-sector industries and 23 OECD countries and Slovenia.[15] The main sample includes a simple cross-section of industry-level data averaged over the period 2000-07 (see Figure 3.1). Following previous OECD research (see *e.g.* OECD, 2004; 2006a, 2007), EP is measured here using a cardinal index varying from 0 to 6 from least to most stringent (data are from Venn, 2009). The estimation procedure is based on the assumption that EP is more binding on firms' behaviour, thereby potentially having stronger effects on gross worker flows, in industries that, in the absence of regulation, have greater propensity to adjust on the external labour market, as measured by worker reallocation rates. In order to reduce bias due to the possible relationship between EP stringency and the cross-industry distribution of gross worker flows, worker reallocation rates by industry in the United States, the least regulated country, are used as a benchmark to measure external-adjustment propensity in the absence of regulation. However, several alternative benchmark measures of this propensity are also considered, including UK reallocation rates, US dismissal rates, and the predicted value of reallocation when the EP index is equal to zero, estimated on the basis of all countries in the sample (see Bassanini *et al.*, 2010, for more discussion of data, estimation methods and detailed results).

EP on regular contracts is estimated to have a statistically significant negative direct demand effect on worker reallocation – that is, the direct effects emerging because EP provisions create potentially binding constraints on firm behaviour (see Box 3.3) – once the impact of demographic characteristics and the share of temporary workers have been controlled for (Figure 3.5). By controlling for the share of temporary contracts, it is possible to obtain estimates that are close to the effect of EP on the reallocation of workers on open-ended contracts. This is key from a policy perspective: as discussed above, there is in fact much evidence in the literature that high rates of reallocation due to extensive use of temporary contracts yield inefficient outcomes in terms of productivity growth. Figure 3.5 presents the estimated average impact of EP for regular workers, obtained under the assumption that EP would have no direct effect in an hypothetical industry whose benchmark measure – the US worker reallocation rate, in this case – would be equal to zero (see Box 3.3).[16] Under this assumption, a one point increase in the index of EP stringency for regular workers – roughly corresponding to two-thirds of the difference between the OECD average and the country with the lowest value of the EP index (United States)[17] – appears to reduce, on average, both total and excess worker reallocation by between 5.2 and 6.7 percentage points, depending on which confounding factors are included in the specification. Similarly, the same variation in EP stringency is estimated to reduce separation rates by between 3 and 3.6 percentage points, and hiring rates by between 2.2 and 3 percentage points.

Rigorously speaking, the estimates presented in Figure 3.5 refer only to partial-equilibrium labour demand effects. In principle, general-equilibrium mechanisms can enhance or offset these effects (see Box 3.3). In order to shed light on this issue, for a smaller group of 20 countries, the above analysis is complemented with a standard cross-country/time-series investigation using annual industry-level data for the period 1995-2007. The effect of EP provisions is identified in this case through its over-time variations

Figure 3.5. **Impact of regulation for individual and collective dismissals, controlling for the share of temporary workers**



Note: Based on difference-in-difference OLS estimates. For each gross flow measure, minimum and maximum indicate the smallest and greatest estimate (in absolute terms), respectively, obtained in different specifications, of the average effect of a one-point increase from the OECD average in the EP index for regular workers (including additional restrictions for collective dismissals). Estimates are obtained by assuming that, in each industry, the impact of employment protection is greater, the greater the US reallocation rate for that industry. All specifications control for the shares of age groups and of temporary workers. Estimates are based on 24 business-sector industries for the countries reported in Figure 3.1, except Turkey. Data are averaged over the period 2000-07.
***: statistically significant at the 1% level.

Source: OECD estimates.

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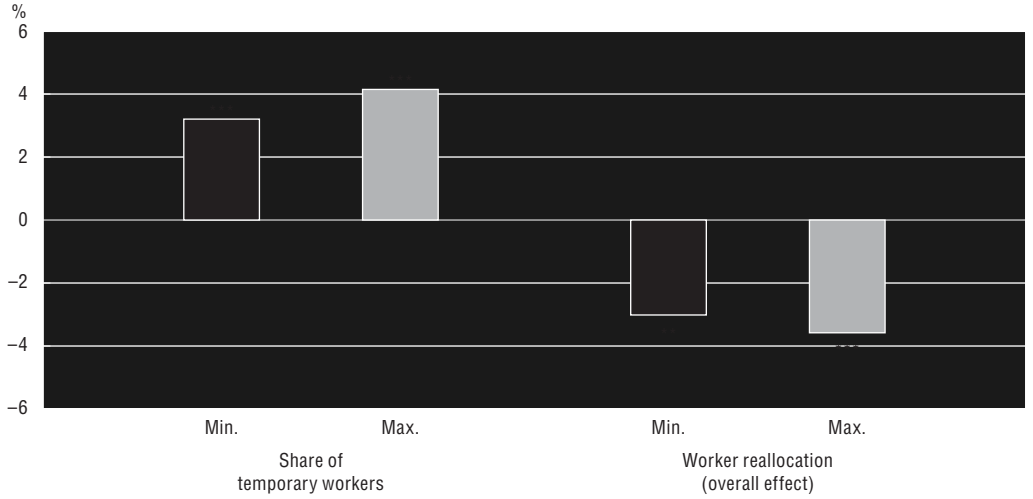
only and thus it is possible, in principle, to capture the overall impact of EP resulting from both general and partial equilibrium effects. But, these estimates might well suffer from an omitted-variable bias as well as they are likely to be more plagued by measurement error, given the limitations of available data. Nonetheless, the estimated effects of a one-point change in the index of regulations for individual and collective dismissals obtained in this way vary between 6 and 10 percentage points (see Bassanini *et al.*, 2010, for full results). Despite all the limitations of the time-series analysis, the consistency of results with the difference-in-difference analysis is reassuring and suggests that, by and large, general-equilibrium effects over and above partial-equilibrium direct effects are, if any, of the same sign and average estimated effects presented in Figure 3.5 can be taken to provide a lower bound to the actual general-equilibrium effect of employment protection.

… even taking into account that they induce more extensive use of temporary contracts

Estimates presented above are not directly comparable to Figure 3.1, mainly because the effect of EP for regular workers on the share of temporary workers has not yet been quantified. A better comparison is made possible by estimates presented in Figure 3.6, which show that a reform involving a one-point reduction in EP for regular workers, if taken at face value, would bring about a reduction in the share of temporary workers of between 3.2 and 4.2 percentage points. Adding this to the direct effect would translate in an overall positive impact on worker reallocation of between 2.9 and 3.6 percentage points.[18] These are indeed large effects from an economic point of view, even though a one-point change of the index corresponds to an unusually large policy change from a historical perspective (see Venn, 2009). To have a better idea of the magnitude of these

Figure 3.6. **Regulation for individual and collective dismissals, share of temporary workers and overall impact on worker reallocation**



Note: Based on difference-in-difference OLS estimates. For each dependent variable, minimum and maximum indicate the smallest and greatest estimate (in absolute terms), respectively, obtained in different specifications, of the average effect of a one-point increase from the OECD average in the EP index for regular workers (including additional restrictions for collective dismissals). Estimates are obtained by assuming that, in each industry, the impact of employment protection is greater, the greater the US reallocation rate for that industry. The overall impact on total worker reallocation is the algebraic sum of the direct impact and the indirect one that occurs through the share of temporary contracts, simultaneously estimated. All specifications control for the shares of age groups. Estimates are based on 24 business-sector industries for the countries reported in Figure 3.1, except Turkey. Data are averaged over the period 2000-07.

, *: statistically significant at the 5% and 1% levels, respectively.

Source: OECD estimates.

StatLink http://dx.doi.org/10.1787/888932292954

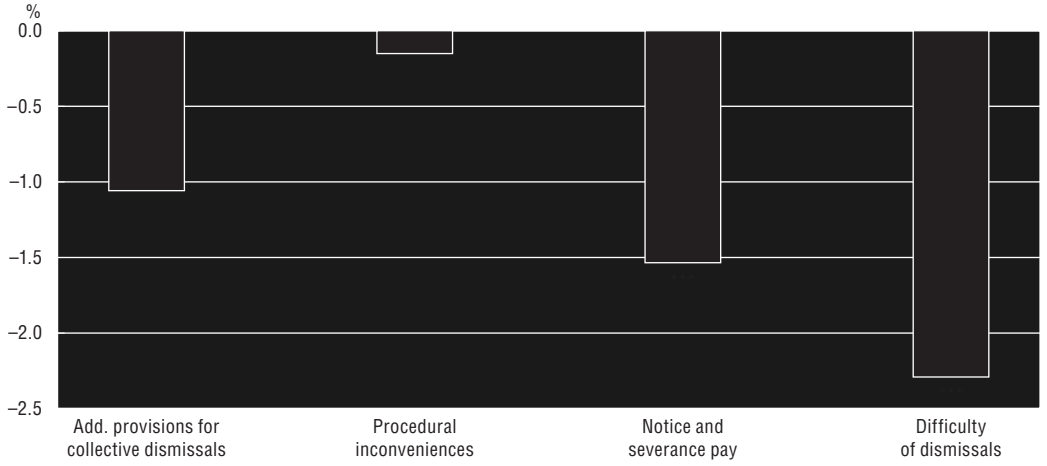
effects, it is possible to observe that, if linear estimates were taken at face value, they would explain between 20% and 30% of the difference in reallocation rates between Greece (the country with the lowest rate in Figure 3.1) and the United States.[19]

These results are very robust to various sensitivity checks, namely to: *i)* changes in the sample of countries used in the estimation; *ii)* changes in the choice of the benchmark measure used to identify the natural propensity to make staffing adjustments on the external labour market; and *iii)* changes in the functional form of the impact of EP, including the possibility that EP has a proportional rather than linear effect on worker flows (see Bassanini *et al.*, 2010).

High severance pay, long trial periods and strict reinstatement rules appear to strongly compress gross flows

Employment protection includes quite heterogeneous provisions that are unlikely to have the same economic importance as well as the same impact on gross job flows. Although different components of the EP index receive different weights in the OECD scoring protocol in order to mitigate this problem (see Venn, 2009), looking at the separate impact of each of them can better inform policy makers of the likely consequences of reforming specific provisions, even though it must be kept in mind that the effect of interactions among provisions cannot be estimated and the greater the disaggregation of EP indexes, the greater the measurement error. When the effect of specific components is simultaneously estimated, procedural inconveniences, including notification delays and procedures, do not have any significant impact on worker reallocation (Figure 3.7). This

Figure 3.7. **Impact of selected EP components on gross worker reallocation**



EP: Employment protection.

Note: Based on difference-in-difference OLS estimates. Average effect of a one-point increase from the OECD average in the indexes for each EP component on total worker reallocation. Estimates are obtained by assuming that, in each industry, the impact of employment protection is greater, the greater the US reallocation rate for that industry. Estimates are based on 24 business-sector industries for the countries reported in Figure 3.1, except Slovenia and Turkey. The specification controls for the shares of age groups and of temporary workers. Data are averaged over the period 2000-07.

***: statistically significant at the 1% level.

Source: OECD estimates.

StatLink http://dx.doi.org/10.1787/888932292973

result might be the outcome of the greater difficulty of scoring this component and, therefore, the greater measurement error associated to it – because of the cross-country heterogeneity of the procedures that are requested in the case of dismissals. However, it appears also consistent with micro studies for Portugal and Sweden that find no significant impact of exemptions from procedural requirements for dismissals (see Martins, 2009; von Below and Thoursie, 2010). By contrast, the EP components that have the greatest and most significant impact on gross worker flows are notice and severance payments and the difficulty of dismissals, including the length of the trial period at recruitment, the breadth of the definition of fair dismissals, and the costs for the employer that are associated to being convicted for unfair dismissal. Disaggregating further the effect of the difficulty of dismissals, it appears that the most relevant components of the latter are the length of the trial period (especially for hirings)[20] and the extent to which reinstatement is ordered by courts (especially for separations; see Bassanini *et al.*, 2010, for detailed results).[21]

By inducing more efficient reallocation, more flexible job security provision can benefit the average worker through higher wages

Do employees benefit from the greater reallocation that is brought about by less stringent employment protection? Even though the literature has not come to a clear-cut conclusion on the optimal level of flexibility from an efficiency viewpoint, the empirical evidence (see *e.g.* OECD, 2007; Autor *et al.*, 2007; Bassanini *et al.*, 2009; Cingano *et al.*, 2010) is now relatively consensual in suggesting that, for countries close to the OECD average, reforms relaxing provisions for individual and collective dismissals would increase productivity growth. Taking into account the equally strong empirical link that is found between gross job flows and productivity growth (see the previous section), and given the magnitude of the effects estimated here, it can be cautiously concluded that the enabling

role, which lighter restrictions on dismissals have for labour reallocation, is the main channel through which EP affects productivity growth. To the extent that EP reforms do not simultaneously reduce workers' bargaining power, thereby depressing the wage share of value added, wage and salary employees will benefit from greater productivity growth through higher wages.

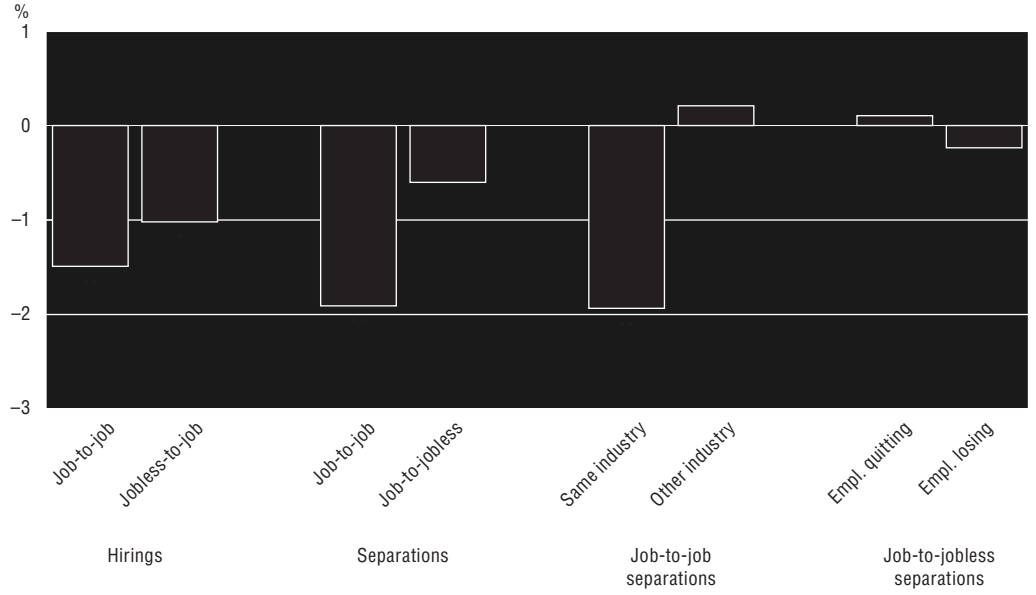
There is surprisingly little research studying the effect of EP on the wage share. The main exception is perhaps Checchi and Garcia-Peñalosa (2008), who estimate a standard static cross-country/time-series model for OECD countries, and find no impact of EP controlling for other institutions. At the micro level, Leonardi and Pica (2007) analyse the effect of monetary compensation for unfair dismissal on male wages by exploiting an Italian reform that introduced this type of compensation for establishments with less than fifteen employees. They find that the reform had no impact on entry wages, although returns to tenure decreased, as suggested by Lazear (1990). Although an exhaustive analysis of this issue is beyond the scope of this chapter, a cross-country/time series empirical model of the determinants of the wage share is estimated and no significant impact of EP emerges, consistent with the literature (see Bassanini *et al*., 2010). This suggests that, on average, wage and salary employees are likely to benefit in the form of higher wages from the productivity boost induced by the removal of barriers to reallocation by means of EP reforms.[22]

Flexibility-enhancing reforms are likely to affect especially the incidence of job-to-job transitions…

Reducing firing restrictions is however quite likely to increase the percentage of workers that experience involuntary separations (although this will reduce the number of workers under short-term contracts). If this occurs, how difficult will it be for this additional fraction of displaced workers to find another job? Unfortunately data on the reason of job separation are not available for all types of transitions. Nevertheless, in order to shed some light on this question, the above analysis is replicated by using different types of transition as dependent variables. From this analysis, it appears that the effect of more stringent EP on separation rates is almost exclusively reflected in lower job-to-job separations, with little and insignificant impact on job-to-jobless separations (Figure 3.8). This cautiously suggests that, in normal periods of activity, those workers, who end up being displaced in the aftermath of a reform aimed at reducing EP for regular workers but would not have been displaced without the reform, are likely to find another job within a relatively short period of time.[23] Obviously this statement might not hold during a severe downturn, because of congestion in the labour market (see Chapter 1). Moreover, flexibility-enhancing EP reforms appear to be entirely associated to more frequent same-sector transitions, which are typically associated to greater wage premia in the case of voluntary job changes and lower wage penalties in the case of displacement (see *e.g.* Neal, 1995). By contrast, the impacts on job-to-job and jobless-to-job hirings are not significantly different (even though both are negative and significant), which suggests that more flexible EP regulations facilitate the transition from non-employment to employment.

Using the same identification strategy and the micro-data underlying Table 3.1 and Figure 3.4, it is also possible to estimate the impact of employment protection for regular workers on the wage premium to job changes. However, in the case of individual wages, general-equilibrium effects might be more important[24] and caution must be exerted in interpreting the results. Nevertheless available evidence suggests that EP for regular

Figure 3.8. **Impact of regulation for individual and collective dismissals on worker reallocation, by type of transition**



Note: Based on difference-in-difference OLS estimates. Average effect of a one-point increase from the OECD average in the indexes for each EP for regular workers (including additional restrictions on collective dismissals). Estimates are obtained by assuming that, in each industry, the impact of employment protection is greater, the greater the US reallocation rate for that industry. Estimates are based on 24 business-sector industries for the countries reported in Figure 3.2, except Slovenia and Turkey. The specification controls for the shares of age groups and of temporary workers. Data are averaged over the period 2000-07.
**, *: statistically significant at the 5% and 10% levels, respectively.

Source: OECD estimates.

StatLink http://dx.doi.org/10.1787/888932292992

workers have no significant effect on the average wage premium to job change. Moreover, EP appears to have substantially larger negative effects on the wage premium to voluntary separations and the wage penalty at re-employment to involuntary separations (see Bassanini *et al.*, 2010). Overall, this cautiously suggests that greater flexibility induced by EP reforms, by creating more job opportunities, improves career tracks for those in employment who wish to search for better jobs, and, conditional on displacement, does not worsen, and possibly improves, job perspectives for displaced workers.

… but the fraction of workers being displaced and suffering from income losses is likely to increase

Milder dismissal regulations, however, are likely to increase the number of workers experiencing involuntary separations. Indeed, the fact that the impact on the average wage premium to job changes is smaller than the corresponding averages of the impacts concerning wage premia/penalties to voluntary and involuntary separations cautiously suggests that flexibility-enhancing EP reforms might increase the fraction of workers suffering from involuntary separations, and this is particularly likely during severe recessions (see Chapter 1). Even though, as discussed above, the evidence suggests that those workers, who would have not been dismissed in the absence of reforms, are unlikely to experience protracted joblessness, at least in normal times, they will nonetheless suffer from an income loss during the possible post-displacement unemployment spell and from the wage penalty at re-employment associated with involuntary separations. As a

consequence, for equity reasons, governments might wish to compensate those who inevitably will experience earning losses after the implementation of this type of reform. More generally, in countries where EP regulations are less stringent, governments might wish to put in place an appropriate policy mix to accompany workers in the transition towards new jobs.

2.2. Unemployment benefits

Unemployment benefits can affect gross worker flows through a variety of channels

There are a number of channels through which unemployment benefits (UBs hereafter) could affect labour reallocation (see Box 3.5). From an empirical point of view, there is mixed evidence on whether generous UBs are associated with higher-quality subsequent job matches: the micro-evaluation literature typically finds small and sometimes insignificant effects both when match quality is measured through wages at re-employment and when it is measured as post-unemployment job tenure (for recent

Box 3.5. **Unemployment benefits and workers' flows: theory**

Unemployment benefits (UBs) can affect gross worker flows through a variety of channels. *First*, generous UBs, by reducing search effort, may increase the duration of unemployment spells and the overall level of unemployment (see OECD, 2006a, for a survey of recent literature). This will tend to slow the transitions from unemployment to employment and therefore gross worker flows. Moreover, generous UBs (in terms of either duration, replacement rate or both) may provide a buffer of time and resources to allow the unemployed to find a job that better matches their skills and experience, resulting in higher quality matches between the unemployed and available job vacancies (Marimon and Zilibotti, 1999). In turn, higher quality job matches are likely to last longer, thereby depressing worker flows. However, the impact on reallocation rates is ambiguous: they could even increase if the effect on employment levels is larger than the effect on flows. *Second*, in a standard equilibrium matching model of the labour market (*e.g.* Mortensen and Pissarides, 1994, 1999), more generous UBs, by increasing the reservation wage, will increase the sensitivity of job-matches to productivity shocks, thereby increasing job destruction in the short-run. If raising benefit entitlements does not affect the productivity of newly-created matches, job destruction will increase also in the long-run and greater unemployment, by increasing the number of applicants per vacancy, will progressively reduce recruitment costs, thereby raising hirings. However, if greater reservation wages increase the productivity threshold at which new job matches are created, thereby increasing the number of low-productivity potential matches that are turned down, the overall long-run effect on gross job and worker flows is *a priori* ambiguous. *Third*, UB generosity might affect firm recruitment behaviour (Pries and Rogerson, 2005). Due to asymmetric information, firms might be unaware of the productivity potential of prospective job applicants. If wages are low with respect to the expected worker performance, the employer can afford to hire and discover on the job the worker's productive abilities. Whenever the newly hired worker turns out to be not suitable for the position, the match is destroyed and the firm issues a new vacancy. By contrast, to the extent that higher replacement rates raise reservation and bargained wages, firms might become choosier in selecting successful candidates. This in turn will reduce experimentation and mismatch, with consequent reduction in hirings, separations and short job spells, without necessarily reducing job creation and destruction. *Fourth*, it is also

Box 3.5. **Unemployment benefits and workers' flows: theory** *(cont.)*

possible that the provision of generous UBs encourages the creation of higher productivity jobs that are located in more volatile, innovative activities, or require workers with more specific skills and, therefore, carry greater risk of job mismatch (Acemoglu and Shimer, 1999, 2000). Job-matches created in this way would be exposed to greater destruction hazards, thereby increasing the pace of labour reallocation.

findings and surveys, see Lalive, 2007; van Ours and Vodopivec, 2008; Caliendo *et al.*, 2009). A few micro studies also suggest that UBs increase the desirability of high-risk jobs. Topel (1984) shows that high-risk jobs pay higher wages in the United States, but this compensating differential is dampened when UBs become more generous. Similarly, Barlevy (2001) shows that even though workers who change jobs during economic booms tend to be hired in high-risk industries where they receive higher wages, UBs reduce the pro-cyclicality of their wages. From a cross-country perspective, there is also some evidence that the generosity of UBs has a positive effect on relative levels of multi-factor and labour productivity in high-risk industries compared with low-risk industries, which is consistent with generous benefits inducing greater creation of high-skilled jobs in risky industries (Bassanini and Venn, 2007).

There is, however, surprisingly little cross-country empirical literature that looks directly at the effect of UBs on gross job or worker reallocation rates. Boeri and Garibaldi (2009) estimate the impact on worker flows using aggregate cross-country/time-series data for 13 European countries and find a negative association of average gross replacement rates with employment-unemployment transitions but little association with job-to-job transitions. Gomez-Salvador *et al.* (2004) find a negative relationship between job creation and benefit duration – but no impact on job destruction – using a classical linear regression analysis based on European firm-level data and controlling for the effect of other labour market institutions, even though not for the level of the replacement rate. By contrast, Sjöberg (2007) finds a positive association between UB generosity and worker flows, by using a cross-section of individual data on job-to-job transitions drawn from Eurobarometer that are, however, simply regressed on aggregate average net replacement rates, with few other institutional controls. Finally, Boeri and Macis (2010) study the effect of reforms that introduced for the first time UB schemes in countries that previously did not have any such scheme. Using a large number of countries that had UBs throughout the period as a control group, they find that the introduction of benefits significantly increases between-industry job reallocation, although the estimated effect fades over time. Nevertheless, the relevance of this result remains limited since between-industry reallocation accounts for only a small fraction of total reallocation (see OECD, 2009).

Unemployment benefit generosity appears to have a positive impact on average gross worker flows…

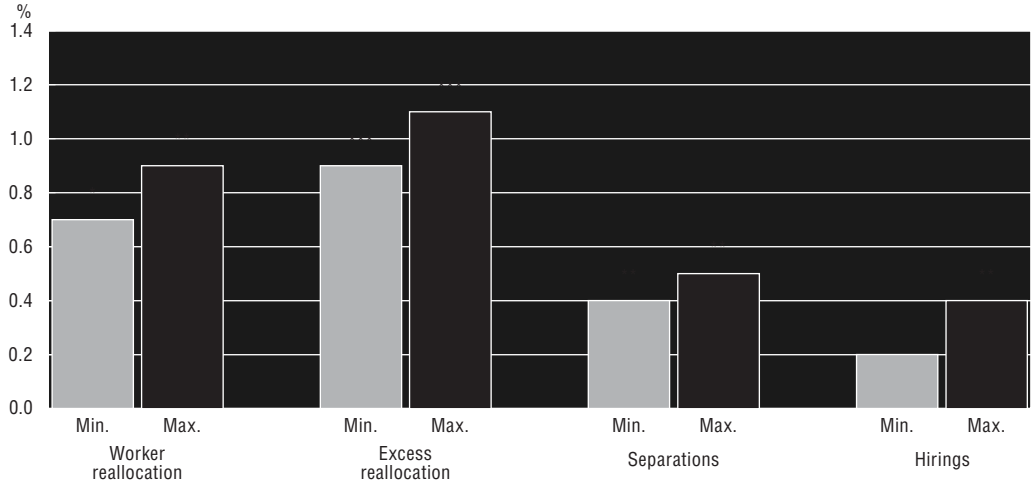
For the purpose of this chapter, the impact of average UB *net* replacement rates, excluding social assistance, on gross worker flows is estimated using the difference-in-difference procedure described in Box 3.3, for the same sample used for EP, except that Slovenia is excluded due to lack of UB data. The estimation procedure is based on the assumption that UBs have stronger direct demand-side effects on gross worker flows, be they positive or negative, in industries that are more naturally exposed to productivity

shocks requiring workforce adjustments and/or have a greater tendency to experiment with new recruits. It can be argued that the cross-industry distribution of gross worker flows is closely associated with the frequency of idiosyncratic productivity shocks on businesses and the need of experimenting with new recruits. Therefore, worker reallocation rates by industry in the United States – that is, the country with the lowest benefit generosity – appear to be a reliable measure of workforce adjustment needs. However, several alternative benchmark measures of this propensity are also considered, including the predicted value of labour reallocation at zero net UBs, estimated on the basis of all countries in the sample,[25] and UK firm turnover rates[26] (see Bassanini *et al.*, 2010, for more details on the data, estimation methods and detailed results).

Figure 3.9 presents difference-in-difference estimates of the average direct effect on worker reallocation of UB generosity – measured through the average of net replacement rates across different family types, income levels and unemployment durations – that appear to be positive and statistically significant in almost all cases. Nevertheless, similar coefficients are estimated by using time-series variation only within a standard cross-country/time-series regression framework over annual industry-level data for the period 2001-07. Even though the time period on which the latter estimates are obtained is very short, this finding cautiously suggests that additional general-equilibrium effects (including labour supply effects) offset each other, so that estimates presented in Figure 3.9 can be interpreted as representative of the overall effect of net UBs on gross worker flows.

A ten-percentage-point increase in the average net replacement rate – a large reform from an historical perspective, roughly corresponding to two standard deviations of the time-series variation of the indicator observed over the period (that is, obtained netting out

Figure 3.9. **Unemployment benefit generosity and gross worker flows**



Note: Based on difference-in-difference OLS estimates. For each gross flow measure, minimum and maximum indicate the smallest and greatest estimate (in absolute terms), respectively, obtained in different specifications, of the average effect of a ten-percentage-point increase from the OECD average in the average net replacement rate (computed for different earnings level, family situations and unemployment durations up to five years). Estimates are obtained by assuming that, in each industry, the impact of unemployment-benefit generosity is greater, the greater the US reallocation rate for that industry. All specifications control for the shares of age groups and of temporary workers. Estimates are based on 24 business-sector industries for the countries reported in Figure 3.1, except Slovenia and Turkey. Data are averaged over the period 2000-07.
*, **, ***: statistically significant at the 10%, 5% and 1% levels, respectively.

Source: OECD estimates.

StatLink http://dx.doi.org/10.1787/888932293011

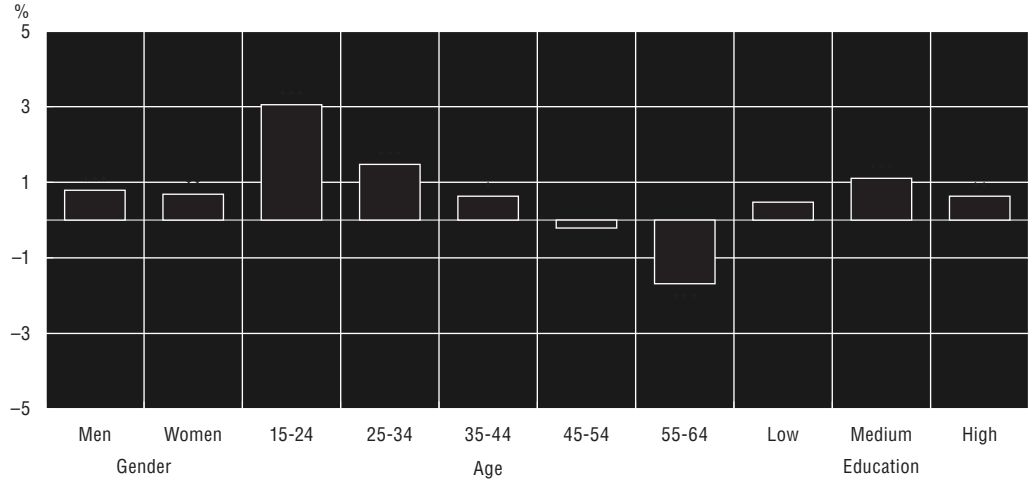
cross-sectional variation) or a 25% change from the OECD average – appears to increase, on average, both total and excess worker reallocation by about 1 percentage point. These results are reasonably robust to various sensitivity checks: *i)* changes in the sample of countries used in the estimation; *ii)* changes in the choice of the benchmark measure used to classify industries; and *iii)* changes in the functional form of the impact of UBs, including the possibility that EP has a proportional rather than linear effect on worker flows.

A slightly greater elasticity is found in the case of separations. By contrast, the link with hirings is not always significant, when estimated partial-equilibrium effects are obtained through difference-in-difference cross-section estimates, but it is as large as the effect on separations when general-equilibrium effects estimated in time-series are considered. This appears consistent with the prediction of search and matching models (see Box 3.5), for which the main direct effect of any increase in the reservation wage is on job destruction, but there is an indirect general-equilibrium effect on job creation as raising the number of job applicants makes filling vacancies less costly for firms. Clearly, the latter effect can only partially be captured by difference-in-difference estimates.

... but it has a negative impact on flows of mature and older workers

Looking at differences across groups in the association between cross-industry differences in gross job flows and average net replacement rates sheds additional light on the channels through which UB generosity affects labour reallocation. In fact, the positive relationship between UB generosity and gross worker flows is confined to relatively young workers (Figure 3.10). As age increases, this relationship becomes progressively weaker and becomes negative for older workers, so that for workers aged

Figure 3.10. **Impact of unemployment benefit generosity on worker reallocation, by group**



Note: Based on difference-in-difference OLS estimates. Average effect of a ten-percentage-point increase from the OECD average in the average net replacement rate (computed for different earnings level, family situations and unemployment durations up to five years). Estimates are obtained by assuming that, in each industry, the impact of unemployment-benefit generosity is greater, the greater the US reallocation rate for that industry. Specifications control for the share of temporary contracts, age classes, gender, educational attainment and the interaction of other institutions with industry US reallocation rates. Data are averaged over the period 2000-07.
*, **, ***: statistically significant at the 10%, 5% and 1% levels, respectively.

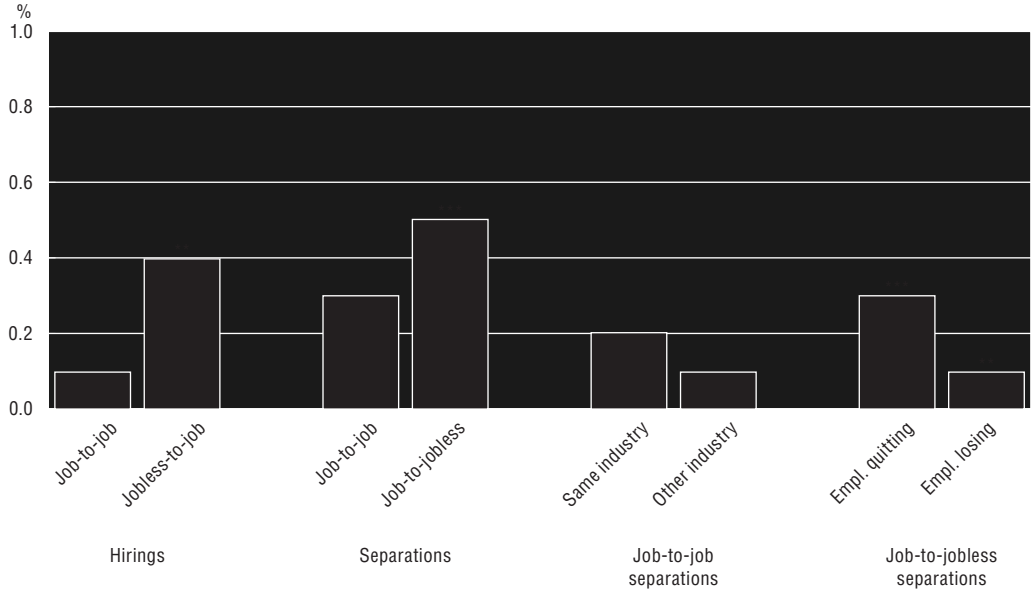
Source: OECD estimates.

StatLink http://dx.doi.org/10.1787/888932293030

55 years or more a ten-percentage-point increase in unemployment benefits would reduce gross worker reallocation by more than one and a half percentage points. This evidence could reflect the fact that generous benefits might represent a post-displacement route to *de facto* early retirement in the case of older workers thereby reducing their hiring rate. Indeed, this effect is likely to be larger in industries where separations are more frequent. Nevertheless, it might also suggest that higher reservation and bargained wages induced by generous UBs make firms more selective in their recruitment policies, thereby reducing experimentation with new recruits, as predicted by Pries and Rogerson (2005). In fact, this effect is theoretically predicted to occur only for workers eligible for benefits, thereby excluding most of youth. By contrast, the direct job-destruction effect, predicted by standard equilibrium matching models, applies at any age,[27] and the same occurs for indirect general-equilibrium effects for hirings. All these effects add up, generating the age pattern shown in Figure 3.10.

Consistent with the microeconometric literature (see above), generous UBs appear to increase job-to-jobless transitions while they do not appear to have any major impact on job-to-job transitions, reflecting the fact that unemployment spells tend to become longer when UBs are more generous (Figure 3.11). More surprising is perhaps the fact that a symmetric effect appears on the hiring rates of workers that were jobless at beginning of the survey year. However, this is likely to reflect the age patterns discussed above, insofar as jobless-to-job transitions are particularly large among inexperienced youth

Figure 3.11. **Impact of unemployment-benefit generosity on worker reallocation, by type of transition**



Note: Based on difference-in-difference OLS estimates. Average effect of a ten-percentage-point increase from the OECD average in the average net replacement rate (computed for different earnings level, family situations and unemployment durations up to five years). Estimates are obtained by assuming that, in each industry, the impact of unemployment-benefit generosity is greater, the greater the US reallocation rate for that industry. Estimates are based on 24 business-sector industries for the countries reported in Figure 3.2, except Slovenia and Turkey. The specification controls for the shares of age groups and of temporary workers. Data are averaged over the period 2000-07.
, *: statistically significant at the 5% and 1% levels, respectively.

Source: OECD estimates.

StatLink http://dx.doi.org/10.1787/888932293049

– particularly those undergoing the school-to-work transition – who are not eligible for benefits and whose reservation wage is unaffected by them.

Greater replacement rates appear also to be positively associated to both employment-losing and employment-quitting separations, suggesting a direct effect on both, even though the former is much larger than the latter. The former effect is likely to reflect the impact of UBs on unemployment spells for eligible workers. In addition, generous UB coverage might facilitate separation agreements between employers and workers, reducing the risk that the latter challenge their dismissals in courts. By contrast, the significant effect of UBs on employment-quitting separations is more surprising as, in principle, workers who quit a job voluntarily are not eligible for benefits. One possible explanation is that these coefficients reflect a greater number of consensual separations in which employers accept to formally dismiss workers in order to grant them benefit eligibility, even though the latter are willing to leave their job anyway. Alternatively, this might reflect the fact that more generous UBs could induce firms to issue more high-risk/high-paid vacancies (as suggested by Acemoglu and Shimer, 1999, 2000; see above), which might prompt more workers to quit their current jobs to search more easily for these better positions. If this interpretation were correct, one would expect that other workers might prefer to search for better positions without quitting their job, thereby implying a relationship between UBs and job-to-job transitions. But, in contrast with this expectation, the effect of UBs on job-to-job separations is insignificant, even if this effect is also insignificantly different from that of employment-losing separations. Available data do not allow being more conclusive on these issues.

Generous unemployment benefits might help sustain post-displacement earnings

Overall, the effect of UBs on labour reallocation is likely to be one of the channels through which UBs positively affect productivity, although probably not the only one (see OECD, 2007, for a discussion of other channels linking UBs to productivity and for estimates of the impact of UBs on growth). Nevertheless, employed workers are likely to benefit from the productivity gains induced by more generous UBs in the form of higher wages.[28] There is no doubt, however, that those who take the greatest advantage of extensive unemployment insurance are eligible workers when they end up being unemployed after an involuntary separation. In the short-run, generous UBs help workers cope with earnings losses in the post-displacement unemployment period. But what is the long-run effect of generous UBs on post-unemployment earnings? Do they raise earnings at re-employment through improved match quality as theory would suggest? The microeconometric literature discussed above is inconclusive on this issue (see above for references). Typically, this literature looks at the effect of a given policy reform on the wage loss at re-employment (with respect to pre-displacement wages) of workers who had been on benefit prior to re-employment. The causal effect of the policy reform is often identified by exploiting group-differences in the changes of potential benefits entailed by the reform (see *e.g.* van Ours and Vodopivec, 2008). The disadvantage of this approach, however, is that it is unable to capture demand-side effects that might affect both treatment and control groups. For example, if more generous benefits push firms to open more high-wage/high-risk positions, as suggested by Acemoglu and Shimer (1999, 2000), this will increase wages at re-employment for all new hires, independently of their benefit entitlements during the unemployment spell, biasing downwards standard micro-evaluation estimates.

This empirical evidence, however, can be complemented by using the individual data underlying Table 3.1 and Figure 3.4 and adopting the same difference-in-difference strategy as above to estimate the impact of UBs on the wage premia/penalties to job changes. As this identification strategy exploits cross-industry differences in the relationship between UB generosity and the wage premia/penalties of the average worker independently of his/her entitlements, evidence gathered in this way is less likely to overlook demand-side effects that apply to all workers[29] and can, therefore, complement micro-evaluation studies in informing policy makers. However, as already discussed as regards EP, general-equilibrium effects on individual wages might be important and caution must be exerted in interpreting the results from this exercise. Keeping this caveat in mind, available estimates obtained through this strategy suggest that an increase in UB generosity is associated with a lower wage penalty at re-employment (see Bassanini *et al.*, 2010), providing some additional evidence that adequate benefits might also promote better job matches

2.3. Minimum wages

Economic theory yields ambiguous predictions on the link between the minimum wage and labour reallocation…

Only few theoretical papers discuss directly the impact of minimum wages on gross worker flows. Burdett and Mortensen (1998) argue that in the presence of employer monopsony power, the distribution of wages can be inefficiently dispersed and separations rates excessively large. In such a case, minimum wages, by compressing the distribution of wage offers, could reduce voluntary separations and improve tenure. By contrast, Pries and Rogerson (2005) argue that high minimum wages, by increasing hiring wages, raise the productivity threshold at which job matches are created and make firms more selective in their recruitment practices. This will inefficiently reduce both hirings and separations. By running different simulations with their model, the authors predict a much greater effect of changes in the minimum wage than of changes in EP.

By contrast, the theoretical literature on the effects of wage rigidity on gross job and worker flows typically predicts a positive correlation between rigidity and labour adjustments. For example, Bertola and Rogerson (1997) argue that in the presence of downward wage rigidity, firms hit by negative shocks, being unable to adjust labour costs, will increase labour shedding, implying greater separations and subsequent re-hiring when their prospects improve. To the extent that binding minimum wages do not adjust as a function of economic conditions and firm performance, this argument can easily be applied to minimum wages as well.

There is a large empirical literature on the impact of statutory minimum wages on worker flows based on individual data from the United States. While early studies tend to find negative impact of minimum wages on job retention for individuals at, or close to, the minimum wage, more recent studies, by improving the sources of identification, have generally found no significant impact (Zavodny, 2000; Abowd *et al.*, 2005). Evidence for other countries is scarcer. Abowd *et al.* (2005) find no impact of real minimum wages on entry into employment in France, but a strong positive impact on exit from employment. By contrast, Portugal and Cardoso (2006), exploiting a specific Portuguese reform that in 1987 lifted dramatically minimum wages for very young workers, find that raising minimum wages had a significant negative effect on both separations and hirings. Finally Draca *et al.* (2008), using a difference-in-difference methodology similar to that adopted in

this paper but on firm-level data, find that the introduction of a minimum wage in the United Kingdom in 1999 lead to insignificant changes in firm entry and exit patterns. Anyway, the degree to which this empirical evidence simply reflects short-time adjustment to a new equilibrium with different employment levels is unclear.

… and no significant effect emerges from empirical estimates

In order to complement the inconclusive findings of the micro-econometric literature, a cross-country analysis of the impact of statutory minimum wages on gross worker flows is estimated using the difference-in-difference technique used above (see also Box 3.3) for a sample of 14 OECD countries.[30] Two alternative identifying assumptions, derived from the theoretical arguments underlined above, are considered. On the one hand, minimum wages are particularly likely to prevent downward adjustment of wages for workers that are paid the minimum wage or only slightly more. As a consequence, industries that, because of their technological characteristics, are more heavily reliant on low-wage labour are likely to be more affected by any change in the minimum wage. Following Bassanini and Venn (2007), in order to reduce bias due to the possible relationship between minimum wages and the distribution of low-wage employment, the incidence of low-wage workers by industry in the United Kingdom prior to the introduction of statutory minimum wages in 1999 – when there was virtually no floor on wages, except for constraints imposed by collective bargaining – is used as an indicator of the propensity of industries to employ low-wage labour.[31] Alternatively, as done for UBs, it can be argued that the effects of minimum wages, be it positive or negative, is likely to be larger in industries where gross worker flows tend to be larger, since greater flows are related to the frequency of idiosyncratic productivity shocks on businesses and the selectivity of firm recruitment policies. For this reason, US industry-level gross worker reallocation is used as an alternative benchmark measure to classify industries.[32] Minimum wages are measured as the economy-wide ratio of the gross statutory minimum wage to the median wage (see Annex 3.A1 for more details). Available evidence obtained on this basis suggests, however, that the ratio of the statutory minimum wage to the median wage is associated with no significant alteration of gross worker flows. Estimates appears also robust to changes in the sample of countries used in the estimation (see Bassanini *et al.*, 2010). Overall, taking also into account the micro-econometric literature, this suggests that statutory minimum wages have at best second-order impacts on labour reallocation.

2.4. Anti-competitive product market regulation

Barriers to firm entry are predicted to reduce gross worker flows…

There is a large consensus in the economic literature that regulations increasing the cost for firms of establishing new businesses in a specific market reduce both entry and exit of firms. If entry costs are lowered by a regulatory reform, ex-ante expected benefits from entry will be higher, thereby lowering the expected-productivity threshold at which a firm decides to set up its business. However, if the same regulatory reform does not affect each firm's potential operating costs, net of starting costs, productivity shocks will more frequently force low-productivity newly entered firms out of the market (*e.g.* Hopenhayn and Rogerson, 1993). Given that entry and exit account for about one-third of gross job flows (see OECD, 2009), barriers to entry are likely to have an important impact on labour reallocation. Moreover, entering firms might be more efficient than incumbents, thereby forcing the latter to downsize and, possibly, exit the market (*e.g.* Aghion and Howitt, 1998).

Finally, entering firms are likely to progressively expand, as they learn-by-doing how to run their business efficiently (*e.g.* Bahk and Gort, 1993).

… but other types of regulations might increase them…

Other types of regulation, such as price controls and public authorisation of strategic decisions, by potentially affecting normal operating costs of firms, have theoretically ambiguous effects on gross job reallocation. In fact, changes in these costs can increase or decrease the reactivity of firms to productivity shocks. On the one hand, an increase in operating costs also makes entry less attractive, which by reducing the number of firms increases equilibrium prices. On the other hand, each firm has to spend more on operating costs, which reduces net profits. In equilibrium, the net effect on profits is likely to be less negative/more positive for the most efficient firms, which gain more from higher prices. This might imply that, in order to survive, firms need to be more efficient in more regulated markets with higher operating costs, which would imply a greater sensitivity to productivity shocks (Asplund and Nocke, 2006; Koeniger and Prat, 2007). Finally, the increase in trade competition due to globalisation and trade liberalisation is generally considered to increase restructuring at least in the short-run, thereby increasing job destruction but also job creation (see Melitz, 2003; and OECD, 2007 for a survey).

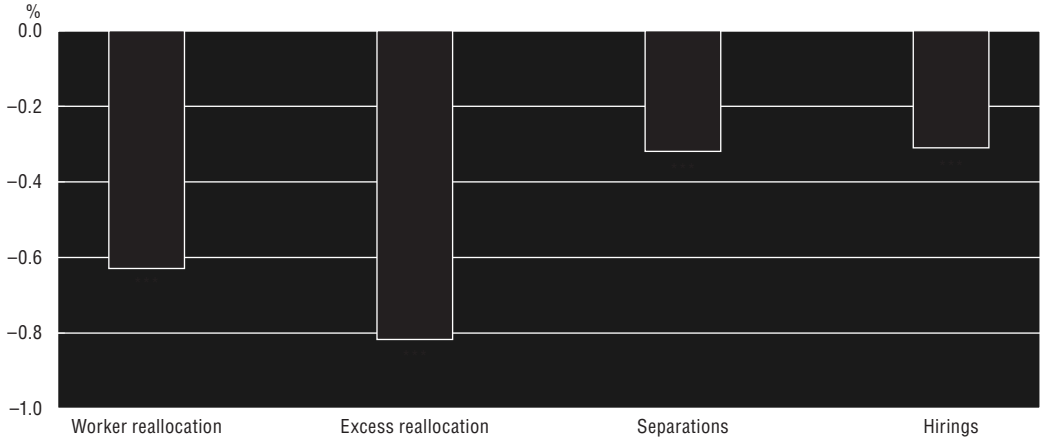
… and there is only limited evidence on the impact of product market regulation on labour reallocation

There is extensive cross-country empirical evidence on the negative association between product market regulation and firm entry and exit (see Schiantarelli, 2008, for a survey). This evidence is supported by the microeconometric literature, which typically tries to identify the impact of deregulation by evaluating the effects of specific reforms (see *e.g.* Aghion *et al.*, 2008). However, while there is abundant research on deregulation and employment and earnings (see *e.g.* Hirsch and Macpherson, 2000; Black and Strahan, 2001; Wozniak, 2007), there are fewer studies that look directly at the effect of deregulation on gross job and worker flows, and most of this literature focuses on the impact of trade with mixed results, particularly on job-to-job transitions (see *e.g.* OECD, 2007; Bloom *et al.*, 2010). Using a difference-in-differences estimator on a cross-section of industry-level data for several OECD and non-OECD countries, Haltiwanger *et al.* (2008) find a weakly-positive relationship between overall product market regulation and job turnover.

Product market deregulation appears to have raised labour reallocation in concerned industries

For the purpose of this chapter, the relationship between product market regulation and gross worker flows is estimated through standard regression techniques,[33] by using time-varying industry-level regulatory indicators, and data for 13 European countries, 18 manufacturing and non-manufacturing industries and the period 1996-2007.[34] The choice of the countries is due to data availability and issues of data comparability (see Box 3.3). Figure 3.12 suggests that deregulation of typically-regulated non-manufacturing industries, which were heavily liberalised in the period under study in most countries, significantly increased gross worker reallocation in the concerned industries. However, the magnitude of this effect is small. Taking the estimates at face value, a regulatory reform entailing a one-point reduction in the indicator – which corresponds approximately to the average change observed in these industries in the period and countries under analysis –

Figure 3.12. **Anti-competitive product market regulation and gross worker flows**



Note: Average effect of a one-point increase from the OECD average in the overall indicator of industry-specific anti-competitive product market regulation, based on OLS estimates with country-by-time and industry-by-time fixed-effects. Estimates are based on 18 business-sector industries for 13 European Union countries. The specification controls for the shares of age groups and of temporary workers. Based on annual data for the period 1996-2007.

***: statistically significant at the 1% level.

Source: OECD estimates.

StatLink http://dx.doi.org/10.1787/888932293068

would generate an increase in total worker reallocation of about 0.6 percentage points in the industries affected by the policy change (see Bassanini *et al.*, 2010 for full regression results). However, the effect of economy-wide regulations on entry (*e.g.* administrative regulations on start-ups) is controlled for but not identified in these specifications, since they do not vary across industries. Insofar as these are the regulatory provisions that are likely to have the strongest impact on firm entry (see above), estimated effects presented in Figure 3.12 are likely to underestimate the true overall impact of regulation.

Conclusions

This chapter analyses the impact of specific policies and institutions on labour reallocation by using harmonised industry-level data for several OECD countries. Previous OECD research suggested that labour reallocation is one of the main drivers of productivity growth and showed that several labour and product market policies and institutions have a significant impact on productivity growth. The evidence presented in this chapter provides a further step towards understanding the mechanisms through which labour reallocation shapes the relationship between these policies and institutions and productivity growth. In this respect, one of the main findings of the chapter is that employment protection for regular workers (including additional restrictions on collective dismissals) significantly depresses gross worker flows, and its cross-country variation can explain up to 30% of the cross-country variation in total flows. By contrast, generous unemployment benefits are found to promote labour reallocation.

The chapter's findings, nevertheless, do not imply that flexibility-enhancing reforms are always desirable. In particular, the experience of those countries that implemented partial reforms of employment protection legislation, whereby regulations on temporary contracts were weakened while maintaining stringent restrictions on regular contracts, shows that specific reforms fostering labour reallocation might have offsetting effects on the efficiency of the reallocation process resulting in no or negative overall productivity

gains. Indeed, the possible trade-offs between the quantity and quality of the reallocation process and the possible policy influences on these trade-offs deserve further research, whose results would be of a fundamental importance in helping policy makers identifying the optimal policy mix from an efficiency viewpoint.

More research is also needed on the way productivity – and, more generally, welfare – gains from efficiency-enhancing reforms are shared within a society. There is some evidence suggesting that the likely effect of selected labour and product market policies and institutions (including employment protection, unemployment benefits, and product market regulation) on the wage share in value added is limited, which cautiously leads to the conclusion that the benefits of productivity-enhancing reforms in this area are likely to be shared with workers in the form of higher average wages. However, not all workers are likely to gain from these reforms in the same way. In particular, the evidence presented in the chapter also suggests that reforms involving the relaxation of regulatory provisions on individual and collective dismissals are likely to increase the number of workers who are affected by labour mobility at the initiative of the employer. Even if the evidence suggests that, in normal times, those who lose their jobs in the aftermath of these reforms – but would have not lost their jobs otherwise – are likely to find another job relatively quickly, these workers are nonetheless likely to experience income losses both during their job search and at re-employment. Moreover, in a severe economic downturn as recently, finding a job is likely to be harder, due to labour market congestion, and wage penalties at re-employment larger (see Chapter 1). For equity and political-economy reasons, therefore, in countries where employment protection legislation is relatively flexible and/or where relaxation of these regulations is envisaged, governments might wish to put in place an adequate policy mix to reduce these individual losses. Providing adequate unemployment benefits could be part of such a policy mix if they are made conditional on strictly-enforced work-availability conditions and part of a well-designed "activation" package, as suggested by the restated *OECD Jobs Strategy* (see OECD, 2006b). Indeed, without impairing labour reallocation, unemployment benefits designed in this way will sustain income during job search and might promote better job matches and hence reduce wage losses at re-employment – albeit the evidence is not conclusive on the latter effect. However, a reform package involving relaxing overly stringent employment protection provisions coupled with adequate unemployment benefits, properly-enforced job-search requirements and effective re-employment services can be costly and would require adequate administrative capacity.

Notes

1. The aggregate data presented in this section (except for data on unemployment and long-term unemployment) are adjusted for industry composition and refer to the non-agricultural business sector. Adjusted rates are estimated as average rates that would be observed in each country if it had the same industry composition as the average country in the sample. Simple comparisons of country-specific averages would in fact be erroneous for two reasons: *i)* because, given the importance of the cross-industry variation, countries that specialise in low-mobility industries could have low unadjusted reallocation rates even if they had above-average reallocation rates in all industries; and *ii)* because data are not available for certain industries in certain countries. See Annex 3.A1 for details on the adjustment method.
2. The choice of countries and years is dictated by the availability of a common household panel for a long time span.
3. Statistically insignificant estimates are not reported (see Bassanini *et al.*, 2010, for full estimates).

4. Note that, given the definition of worker reallocation (see Box 3.1), job-to-job transitions concern those who separate from one employer after $t-1$ and are in employment at t. A proportion of these workers might well have experienced a spell of unemployment between these dates.
5. Indeed, the cross-country correlation between the jobless-to-job and hiring rates in Figure 3.2 is 0.8.
6. The correlation coefficient is -0.44.
7. In the case of job-to-jobless separations, the information on the reason of separation is available and can be used to validate the statement above. Almost 40% of job-to-jobless separations are, on average, due to dismissals, plant closure or end of temporary contract – job-losing separations (see Box 3.1) – and this percentage is roughly constant across countries, so that the cross-country correlation between job-losing and job-to-jobless separations is very high (0.83). As a matter of comparison, in countries for which data are available, about 20% of all separations are due to dismissals or plant closure (see OECD, 2009).
8. Job displacement appears also to have strong negative consequences on mental health (see *e.g.* OECD, 2008; Kuhn *et al.*, 2009).
9. Von Wachter and Bender (2006) find, however, that when sorting and negative selection are taken into account, young displaced workers experience significant wage losses only in the first five years after displacement.
10. The few studies that look at the cross-country impact of institutions on labour reallocation are usually confined to overall employment protection, consider a very small number of OECD countries and often use data that are not comparable across countries (see the next sub-section for a discussion).
11. For example active labour market programmes (ALMPs) and wage-bargaining institutions, which are used as controls in a number of specifications. Short-time working schemes might also have an important impact on gross worker flows (see Chapter 1). However, they are not included in the regressions because of lack of comparable data on them for many countries for the period for which data on worker flows are available.
12. Data in Haltiwanger *et al.* (2008) are, however, harmonised *ex post* using the same definitions and extraction procedure, which makes them in principle comparable.
13. As suggested by Ciccone and Papaioannou (2007).
14. An additional issue concerning Gomez-Salvador *et al.* (2004), Messina and Vallanti (2007) and Cingano *et al.* (2010) is that none of these studies reports information on the data-cleaning treatment, despite using firm-level data from the Bureau van Dijk's Amadeus database where small businesses are severely under-represented and employment data are often inconsistent (see *e.g.* OECD, 2009).
15. Countries are those of Figure 3.1, except Turkey, for which data are available only for one year and therefore, at the industry level, suffer excessively from measurement error.
16. This might sound a very stringent assumption. Yet, this assumption is validated below by showing that standard cross-country/time-series estimates (see next paragraph) yield similar coefficients of the average impact of EP on worker reallocation.
17. One point corresponds also to 1.5 standard deviations in the cross-country distribution of the EP index for regular contracts (including additional restrictions on collective dismissals), as well as to one-third of the difference between Portugal (the country with the most stringent average index in the sample period) and the United States (the country with the least stringent regulations).
18. In principle, this statement should refer only to partial-equilibrium labour demand effects. However, given the results of the cross-country/time-series analysis discussed above, these point estimates may well be a reasonable approximation of general-equilibrium effects with a sufficient precision.
19. Similarly, with these estimated coefficients, it is possible to conclude that cross-country variation in EP for regular workers (including additional restrictions on collective dismissals) explains between 20% and 23% of the cross-country variation in gross worker reallocation, as measured by standard deviations in the respective distributions (adjusted for industry composition in the latter case, as in Figure 3.1).
20. This appears consistent with the findings of Marinescu (2009) on the 1999 British reform that significantly reduced the length of the trial period (see above).
21. Interestingly, this might explain why EP is perceived to be extremely rigid in a country like Italy (*e.g.* Ichino *et al.*, 2004), despite a relatively low score as regards overall EP against individual dismissals. Italy appears, in fact, to score the highest as regards the extent of reinstatement (Venn, 2009).

22. Nevertheless, within the same firm, those workers who are better protected by dismissal regulations are likely to enjoy greater bargaining power and therefore, *ceteris paribus*, greater wages. Indeed, van der Wiel (2010) identify intra-firm effects of employment protection by exploiting a 1999 Dutch reform, which eliminated age-based terms-of-notice rules but implied the coexistence within the same firm of workers under different rules for a transitory period. She finds that those under more stringent rules received higher wages.

23. Notice, however, that, given the definition of job-to-job transitions allowed by the data (see Box 3.1), this finding does not imply that EP reforms would not increase the number of displaced workers that experience short unemployment spells after the separation.

24. For example, because of collective bargaining, wage increases in one industry are likely to boost wages in other industries.

25. Unemployment insurance premia in the United States are, in part, dependent on past layoffs (experience-rating). It cannot be excluded that, despite low average replacement rates, experience-rating creates a distortion in the structure of worker turnover. The use of predicted worker reallocation at zero net replacement rates, estimated on the basis of the whole sample, reduces the risk that the benchmark measure is biased by specific features of the US economy.

26. Firm turnover rates are likely to capture the riskiness of business activities in each industry. Even if the United Kingdom is not the country with the lowest UBs, this country is likely to provide the most adequate firm-turnover benchmark measure since firm turnover is mainly determined by entry regulations, and the United Kingdom is the OECD country where these regulations are less stringent (see Woelfl *et al.*, 2009).

27. If any, the direct productivity-shock/job-destruction effect occurs mainly for workers that were not eligible for benefits at the time of recruitment but have become eligible as they get seniority on the job. For these workers, in fact, one can assume that UBs do not affect the productivity threshold at which efficient job-matches are created.

28. As more generous UBs are likely to increase reservation and bargained wages, it is likely that these productivity gains will translate into higher wages. Indeed, estimates presented in Bassanini *et al.* (2010) shows that higher average net replacement rates are associated with a larger wage share.

29. Albeit it is more likely to suffer from confounding factors at the individual and aggregate levels as well as from composition effects.

30. The sample of previous analyses is restricted to countries in which there was a statutory minimum wage in the period 2000-07.

31. Similar results to those presented in this section are obtained if the UK share of workers with less than upper secondary education prior to 1999 is substituted for the share of low-wage workers.

32. Due to missing observations, UK worker reallocation rates before 1999 cannot be computed for all industries. Therefore, average rates from the United States appear to be the best alternative benchmark, given the low minimum wage and the flexible employment-protection rules in that country. Results are however similar if UK reallocation rates, averaged over 2000-07, are used.

33. In principle, a difference-in-difference analysis of the type developed before could be undertaken. Yet, product market regulation concerns industry-specific as well as economy-wide provisions, and the aggregate OECD indicator of the degree of stringency of anti-competitive product market regulation includes an average of both economy-wide and industry-specific aspects, which would make results difficult to interpret. Nevertheless, the average of this indicator, which is available for three years (1998, 2003 and 2008), is included, interacted with the benchmark measures used to classify industries, as a control variable in difference-in-difference analyses of previous sub-sections, particularly because aggregate indicators of product market regulation are highly correlated with EP indicators across countries (see Woelfl *et al.*, 2009).

34. The sample includes before-enlargement European Union countries, excluding Luxembourg and the Netherlands.

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ANNEX 3.A1

Data Construction and Sources

Worker reallocation

In order to estimate gross worker flows among dependent employees, data from different labour force surveys (LFS hereafter) for 25 countries are used. These data include the European Labour Force Surveys, the bi-annual Displaced workers/Job tenure supplement of the US Current Population Surveys, and the Canadian Labour Force Survey. These data are complemented with national accounts data at the industry level (drawn from EU KLEMS and OECD STAN).

The ratio of annual hirings to employment is computed from job tenure data available in LFS. Workers with tenure shorter than one year are unambiguously new hires according to the definition spelled out in Box 3.1. Separations are then obtained as the difference between hirings and employment changes between two years. As different waves of labour force surveys are hard to compare at disaggregate industry level because the industry dimension is not taken into account in the LFS sampling design, employment level and growth data at the industry level from EUKLEMS or STAN are used for all countries where they are available (all countries except Iceland, Slovenia and Turkey). Hirings and separations are therefore re-scaled on the basis of the discrepancies between LFS and national accounts. Then final reallocation rates are obtained by dividing hirings or separations for the average of employment levels of the two consecutive years, which transitions refer to. More details on this procedure are available in OECD (2009).

For each industry, rates for other types of transitions are obtained by multiplying the hiring or separation rate of that industry, as appropriate, by the corresponding share of each type of transition in total hirings or separations. An additional consistency rule, requiring that job-to-job hirings and separations be equal at the level of the whole economy, is also imposed. The same re-scaling method is used to compute hiring and separation rates by education, gender and age classes.

Other benchmark variables, not based on reallocation data

The US dismissal rate is from OECD (2009) and it is based on various waves of the CPS Displaced Workers Supplement (2000-06, even years). An individual is considered to have been dismissed if he/she lost his/her job in the most recent year covered by each survey, because of plant closing or moved, insufficient work, or position or shift abolished. Only wage and salary employees in the private-for-profit sector are considered. Dismissal rates for other countries used to construct Figure 3.3 are also from OECD (2009), to which the reader is referred to for details.

The UK firm turnover rate is defined as the ratio of job creation by entry plus job destruction by exit to average employment. Data are from Hijzen *et al.* (2007).

The UK share of low-wage workers is the share of wage and salary employees working at least 30 hours per week with gross monthly wages less than two-thirds of the median wage in total workers, averaged over 1994-98. The source is the British Household Panel Survey module of the European Community Household Panel.

Other industry-level data

Several industry level variables are derived directly from LFS. These are the shares of temporary workers, self-employed workers, specific age classes, women and specific educational-attainment classes. In all cases they are obtained as the ratio of the specified group of employees divided by total employees in the same country, industry and year, excluding individuals with missing observations. When data are also disaggregated by gender, age class and educational attainment classes (that is regressions used to compute Figure 3.10 in the main text), the share of temporary workers is obtained as the ratio of employees on temporary contracts divided by total employees in the same country, industry, age class, educational-attainment class, gender and year, excluding individuals with missing observations.

Multi-factor productivity (MFP) growth rates are from EU KLEMS. The wage share in value added is defined as the ratio of gross labour compensation in value added. It is from EU KLEMS except for Canada, Switzerland and Norway, for which it is from OECD STAN. For recent years, EU KLEMS data are extrapolated on the basis of predicted wage-share growth rates from OECD STAN.

Adjustment for industry composition

All figures presented in Section 1 are adjusted for industry composition except when industry-level data are not available (in the case of unemployment data). The following procedure is used to make the adjustment: first, employment shares of each industry are computed for each country and then averaged across countries; second, a weighted regression of industry/country rates on industry and country dummies is estimated using frequency weights proportional to employment shares and imposing the constraint that the average of the coefficients of country dummies is equal to the global average. Estimated coefficients of country dummies will then correspond to the adjusted rates. This can be considered an application of the Frisch-Waugh theorem (*e.g.* Frisch, 1995), which allows retrieving, in a multi-variate regression, the coefficients of a group of independent variables of interest by first separately regressing the dependent variable and the other variables of interest on the remaining group of variables and then fitting a regression on the residuals from the first-stage regressions.

Institutional variables

EP indicators come from the OECD Indicators of Employment Protection (*www.oecd.org/employment/protection*). The index of employment protection for regular workers including additional provisions for collective dismissals is obtained as the weighted average of the indexes for individual and collective dismissals (with weights equal to 5/7 and 2/7, consistent with the overall indicator of EP stringency; see Venn, 2009). All indicators vary from 0 to 6 from the least to the most stringent. UB generosity is

measured on the basis of average replacement rates, defined as average unemployment benefit replacement rates across two income situations (100% and 67% of average worker earnings), three family situations (single, with dependent spouse, with spouse in work) and three different unemployment durations (first year, second and third years, and fourth and fifth years of unemployment). Net benefits are net of taxes and transfers, but exclude means-tested social assistance. The source is the *OECD Benefits and Wages Database*. Industry-specific indexes of anti-competitive product market regulation come from the *OECD Regulatory Database*. Minimum wages are measured as the ratio of the statutory minimum wage to median wage of full-time workers, in per cent from the *OECD Employment Database* (*www.oecd.org/els/employment/data*).

Individual data

All individual data are from the European Community Household Panel. Wages are gross hourly wages obtained as gross monthly earnings in the main job divided by 52/12 and then by usual weekly hours of work for employees working for at least 15 hours a week and not in education. Overtime pay and hours are included.