

OECD Economics Department Working Papers No. 1353

Coping with creative destruction: Reducing the costs of firm exit

Dan Andrews,

Alessandro Saia

https://dx.doi.org/10.1787/bbb44644-en

OECD

Unclassified **ECO/WKP(2016)77**

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development **13-Dec-2016**

English - Or. English

ECONOMICS DEPARTMENT

ECO/WKP(2016)77
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COPING WITH CREATIVE DESTRUCTION: REDUCING THE COSTS OF FIRM EXIT

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By Dan Andrews and Alessandro Saia

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ABSTRACT/RÉSUMÉ

Coping with Creative Destruction: Reducing the Costs of Firm Exit

A policy framework that does not unduly inhibit the creative destruction process is vital to sustaining productivity growth. Yet, a key question is what happens to workers who lose their jobs due to this process and what are the policies that minimise the costs of worker displacement? Accordingly, this paper exploits a retrospective panel of workers in 13 European countries over the period 1986-2008 to explore the factors which shape the re-employment prospects of workers displaced due to firm exit. The results suggest that higher spending on active labour market policies (ALMPs), financed through an offsetting reduction in spending on passive measures, can aid the re-employment prospects of displaced workers. There may also be a case to better tailor ALMPs to workers displaced by firm exit to the extent that the re-employment probabilities of this group of workers are more sensitive to ALMPs than workers that are displaced for other involuntary reasons. The effectiveness of ALMPs is also enhanced by lower entry barriers in product markets and higher public sector efficiency, while reductions in the labour tax wedge can aid the re-employment prospects of displaced workers. Finally, regional mobility emerges as a key channel through which workers who lose their job due to plant closure become re-employed, suggesting that housing market policies may also be relevant.

JEL Classification codes: J38, J58, J63, J68.

Keywords: layoffs, job displacement, labour market policies.

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Accompagner la destruction créatrice: réduire les coûts liés aux fermetures d'entreprises.

Un cadre politique qui n'entrave pas indûment le processus de destruction créatrice est indispensable pour soutenir la croissance de la productivité. Cependant, une question cruciale est de savoir ce qu'il advient aux employés qui perdent leur emploi à cause de ce processus, et quelles sont les politiques qui minimisent les coûts des déplacements de main-d'oeuvre. En conséquent ce papier explore, sur la base d'un panel rétrospectif de travailleurs de 13 pays européens sur la période 1986-2008, les facteurs qui déterminent la ré-employabilité des travailleurs ayant perdu leur emploi en raison d'une fermeture d'entreprise. Les résultats suggèrent que des dépenses plus importantes sur les politiques actives du marché du travail (PAMT), financées par une réduction concomitante des dépenses sur les politiques passives, peut améliorer les possibilités de ré-emploi des travailleurs déplacés. Il peut également être bénéfique de mieux cibler les PAMT sur les travailleurs déplacés en raison d'une fermeture d'entreprise, dans la mesure où les probabilités de ré-emploi sont plus sensibles aux PAMT pour ce groupe de travailleurs que pour les travailleurs ayant perdu leur emploi pour d'autres raisons involontaires. L'efficacité des PAMT est également renforcée par la baisse des barrières à l'entrée et par une plus grande efficacité du secteur public, alors que l'allégement du coin fiscal sur le travail peut aider les chances de ré-emploi des travailleurs déplacés. Enfin, la mobilité régionale émerge comme un moyen important par lequel les travailleurs qui perdent leur emploi en raison d'une fermeture d'entreprise peuvent retrouver un emploi, ce qui suggère que les politiques du logement peuvent également être pertinentes.

Classification JEL: J38, J58, J63, J68.

Mots-clés: licenciement, suppression d'emploi, politiques du marché du travail.

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COPING WITH CREATIVE DESTRUCTION: REDUCING THE COSTS OF FIRM EXIT

By Dan Andrews and Alessandro Saia[1]

> The fundamental impulse that keeps the capital engine in motion comes from the new consumers' goods, the new methods of production and transportation, the new markets…. [The process] incessantly revolutionizes from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact of capitalism.
>
> *Joseph Schumpeter (1942)*

> The process of creative destruction has to be managed.
>
> *Philippe Aghion (2016)*

1. Introduction and main findings

1. Creative destruction is a key feature of well-functioning economies. Over the long-run, productivity growth is sustained by leading firms' experimentation with new ideas, the broad diffusion of advanced technologies and business practices and the reallocation of scarce resources to their most productive uses. The corollary is a more intense churning of firms and jobs than otherwise, as successful market activities are sorted from unsuccessful ones. This churning process is often welfare-enhancing to the extent that it improves the quality of job-worker matching, especially for young people (Davis and Haltiwanger, 2014). But it will also necessarily entail some degree of job destruction, via the downsizing of inefficient incumbents and exit of failing firms, in order to accommodate the growth of productive firms. Thus, a policy framework that does not unduly inhibit the creative destruction process is vital, but it should also consider the potential for adjustment costs. A key question is what happens to workers who lose their jobs due to this process – how quickly are they re-employed and what are the policies that minimise the costs of worker displacement?

2. Accordingly, this paper explores the factors which shape the re-employment prospects of displaced workers. The focus is specifically on those individuals that lost their job due to business because cross-country evidence on their re-employment prospects is rare. Moreover, evidence of weakening market selection implies that reviving productivity growth will partly depend on the restructuring or market exit of a cadre of low productivity firms, thus bringing into closer focus the costs of job displacement associated with mass layoffs and business closure. The sample size of workers analysed is small but politically salient as job loss due to firm exit is typically viewed as an exogenous event that is not specifically due to the actions of the worker (Kletzer, 1998). One implication is that for every worker who loses their job due to firm exit, many more may fear a similar fate, which may create political resistance to structural reforms that intensify job reallocation. In this context, the provision of adjustment assistance to displaced workers is essential, not only as a matter of fairness but on social insurance grounds since there is no economic

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1. Corresponding authors are: Dan Andrews (Dan.Andrews@oecd.org) (OECD Economics Department) and Alessandro Saia (alessandro.saia@unil.ch) (formerly with the OECD Economics Department). The authors would like to thank OECD colleagues Catherine L. Mann, Giuseppe Nicoletti, Jean-Luc Schneider, Lilas Demmou, Oliver Denk, Paula Garda, Valentine Millot (Economics Department) and Andrea Bassanini (Directorate for Employment, Labour and Social Affairs) for their valuable comments; Irene Ferrari (MEA - Max Planck Institute for Social Law and Social Policy) for help with the data and Catherine Chapuis and Sarah Michelson (also from the Economics Department) for statistical and editorial support .

incentive to be served by a reduction in the income of workers who lose their job due to exogenous reasons (Kletzer, 1998).

3. Thus, we look at job loss due to firm exit and focus on the policies that can aid labour market re-integration, especially the contribution of labour market expenditures and taxes, but also allow for potential complementarities with product market regulations and public sector efficiency. Since the effectiveness of these policies will likely be enhanced by policies that enhance labour mobility, the role of regional mobility in minimising the costs of worker displacement is also explored. We exploit a retrospective panel containing micro-level data for a representative sample of workers in 13 European countries over 1986-2008. The country coverage is limited but relevant as it includes many countries where raising productivity via structural reform will likely entail a significant reallocation of resources.

4. Three key findings emerge:

- First, activation strategies appear useful. The probability that workers who lose their job due to plant closure find a job within the next year is positively related to spending on active labour market programmes (ALMPs). By contrast, higher spending on passive measures, such as generous and long-lasting unemployment benefits are associated with lower re-employment probabilities for such workers. Moreover, the re-employment probabilities of workers displaced due to business closure are much more sensitive to such policies than those of workers displaced due to other involuntary reasons. In turn, two policy implications emerge:
  - While some degree of passive spending is desirable from a consumption smoothing and job matching perspective, a hypothesised revenue-neutral reform switching the composition of labour market expenditures more towards well-designed ALMPs could be desirable in countries where spending is overly tilted toward passive measures. Of course, it is important to take ino account the quality of spending on ALMPs (see below).
  - Given the political salience of job loss due to firm exit and the evidence that the re-employment prospects of such workers are more responsive to ALMPs, there may be a case to better tailor ALMP expenditures toward workers displaced by firm exit.
- Second, structural reforms that stimulate labour demand and improve the efficiency of public sector service delivery are important. For example:
  - A lower tax wedge between labour cost and take-home pay is associated with a higher re-employment probability for workers displaced by business closure.
  - ALMPs are more effective in re-integrating displaced workers in environments where entry barriers in product markets are low.
  - There is some evidence that expenditures on ALMPs are more effective in countries with more efficient public sectors, reinforcing the idea that the *quality* of spending matters, as opposed to just the sheer *quantity* of spending.
- Finally, regional mobility emerges as a key channel through which workers who lose their job due to plant closure become re-employed. This suggests a need for policymakers to cast a wider net, and to address a range of policy-induced distortions in housing markets that hinder residential mobility.

5. The paper proceeds as follows. The next section reviews evidence on the benefits and costs of resource reallocation and the literature on worker displacement. Section 3 describes the dataset and presents some preliminary evidence. Section 4 outlines the empirical methodology and Section 5 presents

new evidence on the policy factors that shape the re-employment prospects of workers displaced by firm closure. The final section discusses policy implications to emerge from the analysis.

2. Reallocation, aggregate productivity and worker displacement

6. The productivity slowdown over the past decade brings into to the forefront the barriers to productivity growth in OECD economies. While the sources of the slowdown remain hotly contested, there is evidence that weak productivity growth is at least partly due to resource misallocation (OECD, 2015).[2] There are at least four inter-related dimensions to this problem, with each suggesting a weakening in market selection, whereby inefficient firms increasingly linger – as opposed to exit – the market. First, evidence of rising productivity dispersion raises the question as to how laggard firms that fail to adopt new technologies can survive in the market (Andrews, Criscuolo and Gal, 2015 & 2016). Second, highly-skilled labour is trapped in relatively low productivity firms in many OECD countries, which makes it more difficult for productive firms to expand (Adalet McGowan and Andrews, 2015a). Third, a rising prevalence of old and small firms in some economies, which can consume scarce resources and crowd-out the growth of more innovative firms (Andrews, Bartelsman and Criscuolo, 2015). Finally, a misallocation of capital before the crisis in some economies (Gopinath et al., 2015) and the risk that the crisis and associated policy measures may have perpetuated the flow of capital to financially-weak or so-called "zombie" firms (Adalet McGowan, Andrews and Millot., 2016). In light of this evidence, attaining higher productivity growth is likely to entail some additional churning of firms and jobs, which – as discussed below – raises a number of policy issues.

2.1 The benefits of reallocation

7. The scope for increasing aggregate productivity by reducing misallocation is potentially large. For instance, cross-country estimates of static allocative efficiency (Figure 1, Panel A) suggest that more productive firms are likely to account for a much larger share of employment in the United States than in the European Union. Relative to a random allocation of labour across firms, this actual allocation of labour boosts manufacturing sector labour productivity by almost 60% in the United States, but only by 30% across the European Union on average. Digging deeper, significant differences also emerge within Europe, ranging from relatively efficient labour allocation in some Nordic economies to widespread misallocation in southern Europe.[3] Countries which perform poorly on this metric also exhibit high rates of skill mismatch, which in turn reflects low labour mobility in these countries more generally (Adalet McGowan and Andrews, 2015a, b).

8. Differences in resource allocation are linked to many factors, among which differences in regulations affecting product and labour markets. At least one-half of the US-EU gap in static allocative efficiency is accounted for by policy differences according to some estimates (Andrews and Cingano, 2014). In countries where policy-induced entry and exit barriers in product markets are stringent, allocative efficiency tends to be much lower in sectors with naturally higher firm entry and exit rates than in other countries.[4] One consequence is that gains in productivity in these sectors will not be realised without the

2. Another potential untapped source of productivity growth is improving technological diffusion. However, the incentives for technological diffusion are also partly shaped by the efficiency of resource allocation.

3. More generally, these findings are consistent with recent research highlighting significant cross-country differences in: i) the size of firms at the national productivity frontier (Andrews, Criscuolo and Gal, 2015); ii) the ability for innovative firms to attract resources (Andrews, Criscuolo and Menon, 2014); and iii) the size and post-entry growth patterns of firms (Criscuolo, Gal and Menon, 2015).

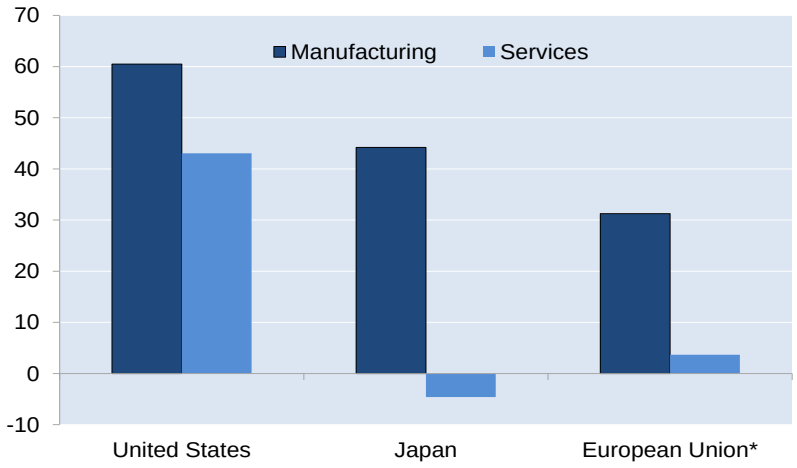
4. Similarly, in countries with stringent employment protection legislation (EPL), allocative efficiency tends to be much lower in industries with naturally higher job layoff rates.

reallocation of resources induced by the exit of inefficient firms. In this regard, structural reforms aimed at accelerating such productivity-enhancing reallocation may be difficult to implement politically if, as is often the case, their aggregate benefits that are relatively diffuse, but their costs are highly visible for the owners and employees of exiting or contracting firms.

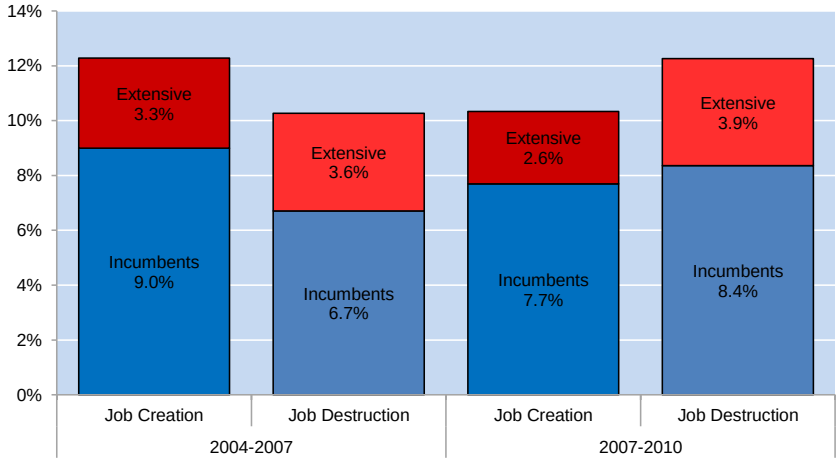
9. The significance of this issue is better understood in light of the millions of jobs that are created and destroyed each year. On average across 16 OECD countries and Brazil, gross job creation and job destruction rates averaged 12% and 10% respectively over 2004-2007, with these figures reversing during the more recent period, which includes the crisis (Figure 1, Panel B). Firm dynamics play a key role in this process, with new entrants accounting for one-quarter of gross job creation, while one-third of gross job destruction is due to firm exit. The churning of jobs on the extensive margin is a key engine of aggregate productivity growth, given that entrants are often agents of radical innovation and exiting firms tend to be relatively inefficient and release scarce resources for more productive firms to use.

Figure 1. Labour reallocation in OECD countries

A: Static allocative efficiency – contribution of the allocation of employment across firms to the level of labour productivity (%)



B: Gross job flows broken down into the intensive (incumbents) and extensive (entry-exit) margins



Notes: The estimates in Panel A show the extent to which firms with higher than average labour productivity have larger employment shares. For example, productivity in the manufacturing sector in the US is around 60% higher due to the actual allocation of employment, compared to a baseline in which labour is allocated randomly across firms (index=0). The contributions in Panel B are calculated as gross job creation and destruction by the entrant/exitor and incumbent status over total average employment, averaged across 17 countries (Austria, Belgium, Brazil, France, Finland, Hungary, Italy, Japan, Luxembourg, Netherlands, New Zealand,

Norway, Portugal, Spain, Sweden, United Kingdom and United States) and three macro sectors (manufacturing, construction, and non-financial business services).

Source: Panel A – Andrews and Cingano (2014); Panel B – Criscuolo, Gal and Menon (2014).

10. But how inclusive is this productivity-enhancing creative destruction mechanism? To be sure, there are credible reasons to believe that job and worker reallocation is desirable for worker welfare over the longer run. For the unemployed, more reallocation goes hand in hand with a higher arrival rate of new job opportunities, which decreases the risk of long-term unemployment. For the employed, labour market fluidity can improve the quality of job-worker matching (Akerlof et al, 1988), particularly for young people due to their lack of experience (Davis and Haltiwanger, 2014), which in turn can facilitate higher wage growth (Topel and Ward, 1992).[5] Moreover, reallocation is a key driver of long-run productivity growth, which in turn creates the fiscal space to finance public investments in health and education. Yet, given the political salience of job loss due to business closure, it is worthwhile to ask what happens to the workers displaced by the exit of low productivity firms?

2.2 The costs of job displacement

11. While a higher pace of reallocation can reduce the adverse consequences of unemployment for those the unemployed, it also implies a higher rate of job destruction (Mortensen and Pissarides, 1994). A key concern is that job displacement can lead to persistent earnings losses (Jacobson et al, 1993), which is typically explained by the idea that getting knocked-off a partially climbed job ladder is costly due to loss of firm-specific human capital, high quality job matches and back-loaded compensation (Carrington and Fallick, 2014). Worker displacement has also been linked to negative outcomes with respect to life expectancy, health outcomes, marital stability, emotional well-being and the education outcomes of displaced workers' children (Davis and von Wachter, 2011; Sullivan and von Wachter, 2009).

12. Cross-country evidence on the costs of job displacement is limited, with the exception of the work by Quintini and Venn (2013), who explore the extent and consequences of job displacement for 14 countries.[6] Job displacement refers to involuntary job loss due to economic or technological reasons, or as result of structural change. In practice, however, it is difficult to accurately measure the true reason for job separation, and displacement is instead identified through two approaches: *firm-identified displacement* using administrative data sources or *self-defined displacement* using household surveys.[7] A priori, it is not clear which approach is preferable but empirical evidence suggests that administrative data tend to overstate the incidence of displacement (by including many voluntary job separations) while survey data may understate the incidence of displacement because workers tend to ignore "less severe" job displacements (von Wachter et al., 2009). This makes cross-country comparisons difficult since it is not possible to apply a unified approach across countries. Moreover, the categorisation of reasons for displacement varies considerably across the countries examined. For example, it is often not possible to distinguish job separations due to business closure from other economic reasons such as dismissal due to

5. For example, Topel and Ward (1992) estimate that switching employers can account for one-third of early-career wage growth among American men.

6. The countries included are: Australia, Canada, Denmark, Finland, France, Germany Japan, Korea New Zealand, Portugal, Russia, Sweden, United Kingdom and the United States.

7. Firm-identified displacement includes job separations from firms that, from one year to the next, experience an absolute reduction in employment of 5 employees or more and a relative reduction in employment of 30% or more (mass dismissal) or that ceased to operate (firm closure). Self-defined displacement covers job separations where the reason given for leaving the previous job is economic (e.g. redundancy, layoff, business slowdown, lack of work, firm closure, mass dismissal, etc.) or dismissal for cause (e.g. poor performance or behaviour, etc.).

cause. As a result of these difficulties, cross-country analysis of the costs of job displacement due to business closure is scarce.

13. Despite these shortcomings, some important insights emerge from this research. Quintini and Venn (2013) find that job displacement affects 2-7% of employees each year over the 2000s. Most of the loss in annual earnings after displacement can be attributed to the time spent out of work rather than lower wage rates upon re-employment. This suggests that helping people return to work as soon as possible is a key policy priority in order to limit both earnings losses and skill depreciation after displacement. On average over the 2000s, around 50% of displaced workers were re-employed within one year, but these estimates range from 30% in Portugal to more than 80% in Finland. It is important to note, however, that the incidence of part-time work typically increases following displacement, with displaced workers who are re-employed within one year, on average, working up to two hours less per week than before displacement.

14. The analysis shows that the costs of displacement can vary with the characteristics of the workers. Older workers tend to suffer from greater earnings losses after displacement than younger or prime-aged workers, while earnings costs of displacement are highest for the least-educated workers. It has also been suggested that re-employed displaced workers that move industry and/or occupation may suffer greater earnings losses than others due to a loss of industry-specific or occupation-specific human capital. As it turns out, however, not all such moves lead to a significant change in the skills used at work. Moreover, amongst displaced workers that use different skills in their new jobs, some workers demonstrate an upgrading in skill requirements, while displacement brings for others – e.g. women, older and mid-to-high-skilled workers – a significant reduction in the use of mathematics, verbal and cognitive skills.

2.3 The role of public policy

15. Cross-country differences in the re-employment prospects of displaced workers raise the prospect that policies may shape the costs of displacement. A long literature has identified the contribution of policies to explaining unemployment in general (Bassanini and Duval, 2006), and exit rates from unemployment to employment more specifically (Murtin and de Serres, 2014). These studies identify a number of relevant policies, including regulations affecting product and labour markets; active labour market policies (ALMPs); the generosity of unemployment benefits; the tax wedge between labour cost and take-home pay; wage bargaining systems and minimum wages. However, since most of them utilise macroeconomic panel data, they do not specifically address the impact of policies on worker displacement.

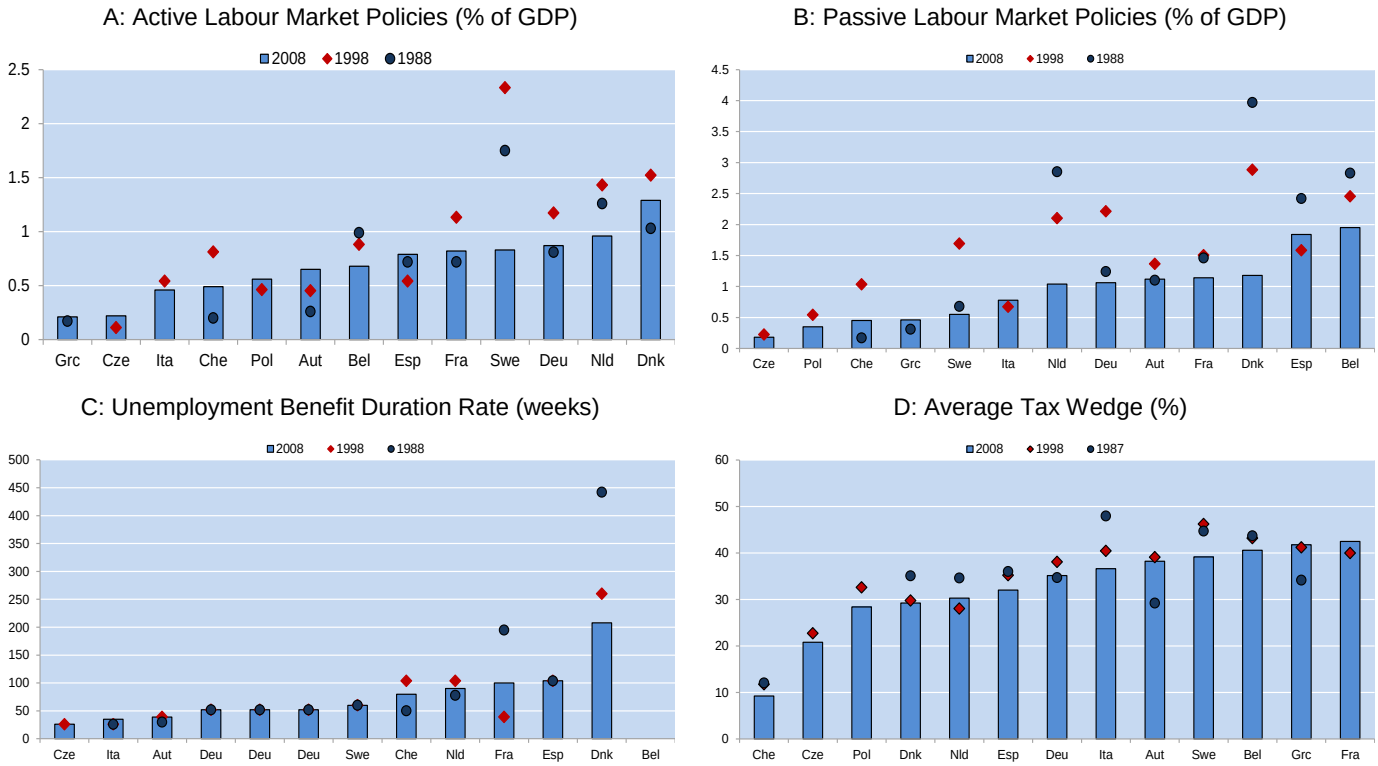
16. A parallel literature explores the short-run effects of structural reforms on the labour market.[8] Perhaps the most closely related paper is Cournede, Denk and Garda (2016), which aggregates monthly data from household surveys to explore how structural reforms to the competitive environment shape annual transitions out of and into employment. Regarding transitions into employment which is most relevant to this study, they find that more flexible product market regulation is associated with higher chances that jobless people become employed, particularly in countries with decentralised wage bargaining systems. In the aftermath of reforms that ease employment protection legislation, higher spending on ALMPs make it easier for jobless people to become employed. While clearly policy relevant, these studies do not specifically address the impact of policies on the costs of worker displacement due to firm exit.

17. By way of background, Figure 2 illustrates the cross-country time series variation in four key labour market expenditures and tax policy variables considered in the analysis: *i*) ALMPs, which includes

8. See for instance: Denk (2016); Bouis et al., (2012); de Serres and Gal (2015); Gal and Theising (2015); Caldera Sánchez et al., (2016).

spending on job-search assistance, training, public sector job creation and subsidised employment in the private sector); *ii*) passive labour market policies (PLMPs), which includes spending on unemployment insurance and related welfare benefits.; *iii*) the unemployment benefit duration rate, which provides an alternate measure of the generosity of PLMPs; and *iv*) the average tax wedge. Cross-country differences in these policy variables are typically significant, while the stance of some of these policies have changed significantly within countries over time. The remainder of the paper explores the extent to which these policy settings can affect the re-employment prospects of displaced workers.

Figure 2. Selected labour market expenditures and tax policy indicators



Source: See Table A1 for details.

3. New evidence on the costs of displacement in OECD countries

3.1 Data description

18. The main data source for the analysis is SHARELIFE – the life history module from the Survey of Health, Ageing and Retirement in Europe. SHARELIFE is a retrospective panel, which collects information on the entire job, housing, health and wage histories of a representative sample of 26,736 older workers and retirees in 13 European countries (Austria, Belgium, Czech Republic, Denmark, France, Germany, Greece, Italy, the Netherlands, Poland, Spain, Sweden and Switzerland).[9] While the data was collected between October 2008 and August 2009, the retrospective nature of the survey allows us to essentially construct a longitudinal dataset on the labour market experiences of individuals over multiple

9. The collected life histories are part of a larger concept: the Survey of Health, Ageing and Retirement in Europe (SHARE). See Börsch-Supan and Schröder (2011).

decades.[10] More specifically, computer-aided personal interviews were used to collect data on key aspects of the five most important domains of the life course: *i*) employment (e.g., number of jobs, job quality, history of work disability); *ii*) children (e.g., number of children, maternity leave decisions, pregnancies); *iii*) partners (e.g., number of partners, history for each serious relationship); *iv*) accommodations (e.g., place of birth, amenities during childhood, number of moves); and *v*) health (e.g., childhood health, current health, health care usage).

19. Crucially, the dataset contains detailed information on the reason a worker left a job, which is classified according to seven distinct categories: *i*) resignation; *ii*) layoff; *iii*) mutual agreement; *iv*) plant/office closure; *v*) completion of a temporary job; *vi*) retirement; and *vii*) other reasons. This contrasts with other micro datasets typically used in job displacement studies where it is often not possible to distinguish between different forms of involuntary layoff (e.g. layoff vs job loss due to plant closure) or in some cases involuntary layoffs and voluntary resignations are grouped together.

20. While this degree of detail is a key advantage of the dataset, it nonetheless has a number of disadvantages that should be kept in mind. First, the data analysed are in the form of annual observations, which may underestimate the incidence of displacement if workers are displaced multiple times over the course of a given year. Second, while the starting wage for each job is observable, information on the final wage is only observable for the main job through a respondents working life. This makes it difficult to estimate the overall earnings costs of displacement, although as discussed above, the time spent out of work rather than lower wage rates upon re-employment tends to be the more important driver of the costs of displacement. Third, the dataset comprises substantially fewer observations than labour force or other household surveys.

3.2 Preliminary evidence

21. With these caveats in mind, Table B1 of Appendix B explores the reason a worker left a job during the sample period. On average across countries, the leading reasons cited were resignation (42%), retirement (18%), the residual other category (16%) and by mutual agreement (10%). In the remaining cases, 5% of workers were laid off while a similar proportion lost their job due to plant/office closure, although this figure ranges from 2.5% in Sweden to 8% in Belgium.[11] It is this latter category of workers to which we now turn our attention.

22. Figure 3 and Table B2 show that workers displaced by business closure are on average, significantly older (by 6 years) and been tenured at the firm for a longer (3 years) than workers that experience involuntary unemployment for other reasons (i.e. layoff, completion of temporary job or the residual category). This is significant to the extent that the costs of displacement have been found to increase with worker age, while displaced workers may encounter difficulties transitioning to other jobs if long firm tenure suggests a high degree of firm-specific skills. Workers displaced by business closure also

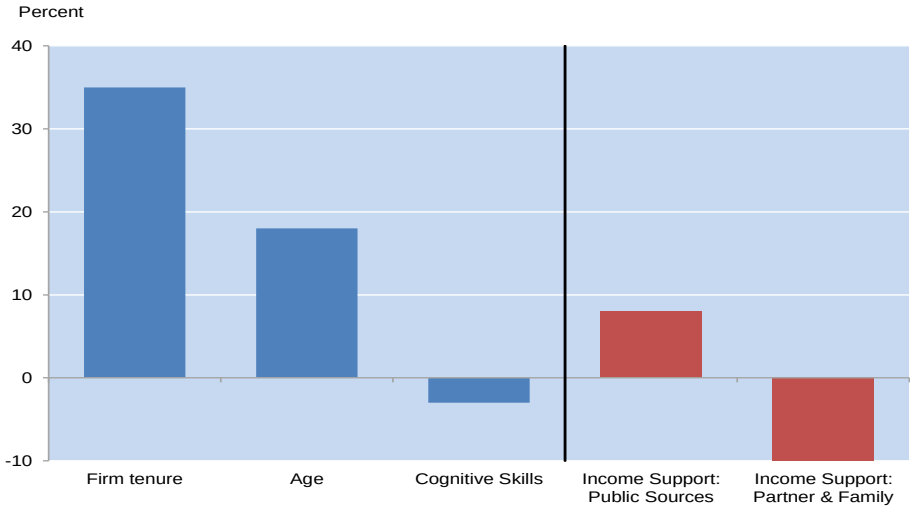
10. For example, if an interview is conducted in 2009 with a worker aged 60 years who entered the labour force at the age of 20 years, then a longitudinal data file containing annual observations from 1969 to 2008 can be constructed for this individual. Since the policy indicators are only available for the most recent period, however, the analysis in Section 5.1 uses the information contained in the retrospective panel that refers to the period 1986-2008. Data limitation is not a relevant concern in the analysis of the role of regional mobility in minimising the costs of worker displacement. Therefore, the analysis presented in Section 5.2 exploits the full retrospective panel of workers.

11. The remaining cases reflected the end of a temporary job.

have lower cognitive skills, although this difference is small and should not be overplayed.[12] At first glance, these characteristics – especially with respect to age and tenure to the extent that they imply lower mobility rates – do not bode well for the re-employment prospects of workers displaced by business closure. Yet, these workers are also more reliant on public sources of income support, than private sources (i.e. partner or family income), illustrating the potential scope for well-designed ALMPs to aid the re-employment prospects of workers displaced by firm exit.

Figure 3. Workers displaced due to firm business closure are different to other workers

Difference in mean characteristics between workers displaced due to business closure and workers who lost their job due to other involuntary reasons (%)



Notes: The figure shows the per cent difference in mean characteristics between workers that lose their job due to business closure and workers that lose their job due to for other involuntary reasons (i.e. layoff, completion of temporary job or the residual category). Cognitive skills capture an individual's ability to perform simple calculations based on real life situations. Table B2 contains the sample mean characteristics for both groups of workers and shows that these differences are statistically significant at the 1% or 5% level.

23. For a sample of individuals who lost their job due to business closure, Figure 4 Panel A tracks their labour market status over each of the following four years. On average across countries, 56% of individuals are re-employed in the following year (t+1), although the corresponding figures are significantly higher for younger male workers and somewhat lower for older female workers.[13] In subsequent years, the incremental gain is only marginal, with the cumulative re-employment probability rising to 60% in year 2, 63% in year 3 and 64% in year 4. The flipside of this is a steady decline in the unemployment rate from 34% in *t+1* to 22% in *t+4*. At the same time, the retirement rate is relatively stable over time although it is interesting to note that about 80% of those retiring did so before the legally mandated minimum retirement age.[14] These patterns confirm a key stylised fact in the literature, namely that re-employment rates tend to stabilise within two years of displacement (Quintini and Venn, 2013).

12. Nevertheless, this is broadly consistent with evidence that displaced workers have lower-than-average educational attainment and skill use in their pre-displacement job (Quintini and Venn, 2013).

13. For example, over 75% of male workers below 40 years are re-employed in the following year, while the corresponding figure for female workers above 40 years is 55%.

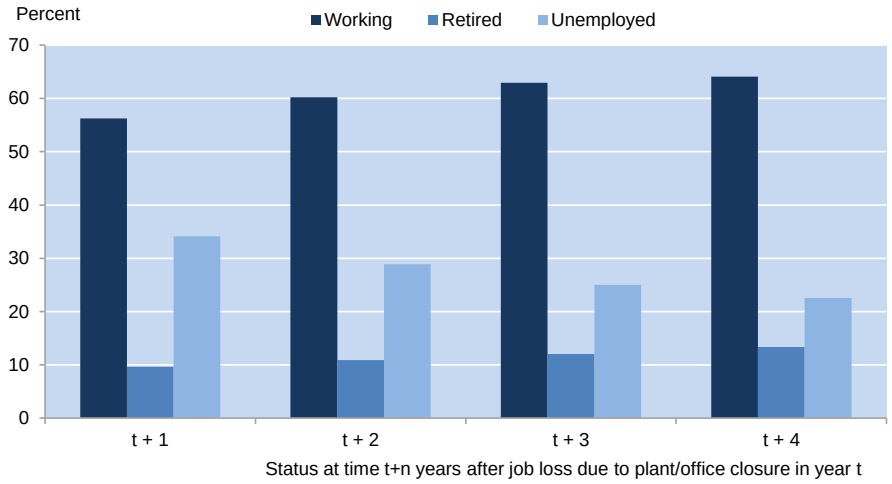
14. This suggests that the re-employment probability for displaced workers might also be negatively affected by retirement schemes that generate excessive incentives to retire before reaching the statutory retirement age. As discussed below, however, we investigated this hypothesis but could not provide any supporting evidence (see Section 5.1.4).

Given that most of the action occurs within the first year, the probability of re-employment one year after job loss due to plant or office closure becomes our variable of interest.

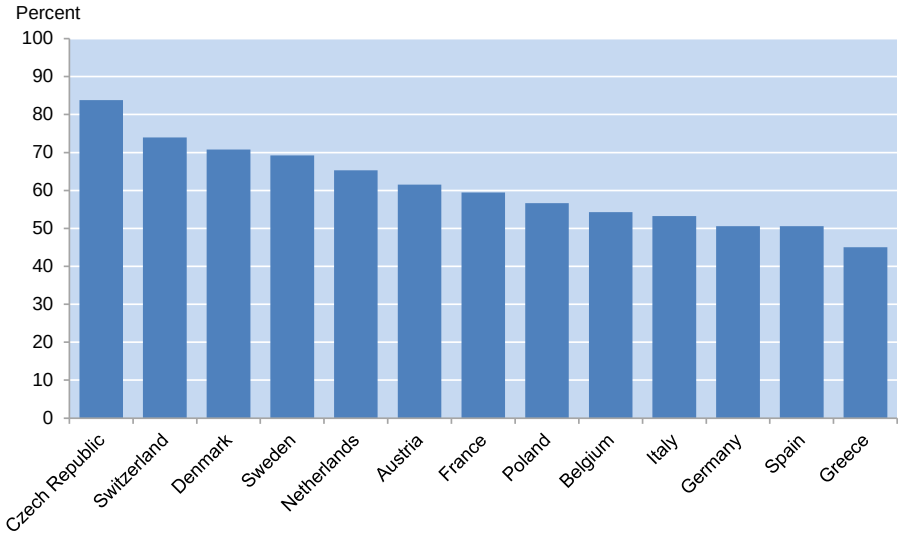
24. These estimates conceal considerable cross-country variation in the probability of re-employment. By way of introduction and purely for illustrative purposes, Figure 4 Panel B shows that the unconditional re-employment probability is at least 70% in the Czech Republic, Switzerland and Denmark, while this figure is closer to 50% in Greece and Spain. At first glance, these estimates suggest that some countries are more effective at re-integrating displaced workers into the labour force than others. What explains these differences?

Figure 4. Labour market status in the years following job loss due to plant/office closure

A: Share of workers by status; Average across 13 OECD Countries, 1986-2008



B: Share of workers re-employed 1 year after plant/office closure; by selected countries, 1986-2008



Notes: Panel A shows the transition probabilities into work, retirement and unemployment in each of the four years following job loss due to business closure. The estimates refer to average rates across countries and years in the sample. The chart in Panel B shows the average cross-country variation in the share of non-retired workers that is re-employed one year after business closure.

4. Empirical framework

4.1 Identifying the role of policies

25. The above estimates are unconditional probabilities which are likely to be influenced by a range of individual, country and year-level factors. Accordingly, to better understand the costs of worker displacement due to firm exit, the following baseline econometric model is estimated:

$$EMP_{i,c,t} = \alpha + \beta_1 X_{i,c,t} + \sum_j \beta_2^j POL_{c,t}^j + \delta_c + \delta_t + \varepsilon_{i,c,t} \quad (1)$$

Where: $EMP_{i,c,t}$ is a dummy variable that takes value 1 if an individual *i* who lost their job due to plant or office closure in a given year found a new job within the next year; or zero otherwise. X is vector of individual-level controls, including age, sex, relationship status and previous job tenure. As a robustness test, this vector is extended to include education attainment and basic cognitive skills based on the individual's ability to perform simple calculations based on real life situations (Dewey and Prince, 2005), although this results in a sizeable reduction in sample size. $POL_{c,t}$ is a set of policy variables – discussed in more detail below – which vary at the country level *c* through time *t*, and are de-meaned to aid interpretation. Also included are country fixed effects to control for time invariant omitted factors and time fixed effects to control for unobserved common global shocks across countries. The standard errors are clustered at the country-five year period level to match the level of variation of the policy indicator.

26. The set of variables included in $POL_{c,t}$ is constrained by the need for a relatively long time series. We focus primarily on the contribution of labour market expenditures and taxes (see Figure 2). These include various measures of the generosity of active (ALMP) and passive (PLMP) labour market programs (see below) and the tax wedge between labour cost and take-home pay. The baseline specification includes only one policy variable at a time but the results are robust to the inclusion of multiple labour market expenditures and tax policies. The results are also robust to the inclusion of product market regulations and the output gap to further control for cyclical influences, although this results in a non-trivial reduction in sample size. We also investigate whether the impact of policies on re-employment probabilities various between workers which lose their job due to business closure, and workers which experience job loss due to other involuntary reasons, as described in Figure 2. Finally, we explore the potential complementarities between ALMPs and product market regulations through the use of interaction terms. This leads us to estimate equation (1) using ordinary least squares (OLS), as opposed to probit or logit model, since it is difficult to interpret the coefficient on interaction variables in a non-linear setting (Norton et al., 2004)[15].

27. Before proceeding, it is important to acknowledge that spending on active and passive labour market programs (ALMPs and PLMPs) respond to changing labour market conditions and therefore may be endogenous to re-employment probabilities. While addressing the endogeneity problem is challenging, we adopt three main strategies. First, instead of using contemporaneous annual variation which will be heavily influenced by the cycle, we average the LMP variables over non-overlapping 5 years periods. Second, we express expenditure on LMPs as a percentage of GDP rather than per unemployed worker as a percentage of GDP per capita.[16] While the latter expression is customary in recent studies, it may overstate

15. However, it is worth noting that the adoption of an alternative model leaves our main results unchanged (see Table B4).

16. However, coefficient estimates using ALMP spending per unemployed worker as a percentage of GDP per capita are also presented for the sake of comparability (see Table B6).

the impact of ALMP spending on re-employment.[17] By contrast, scaling these expenditures by GDP will, if anything, risk understating the impact of ALMPs and thus the estimated coefficient, if positive and significant, could provide a lower bound for the true effect.[18] Third, to test the robustness of the PLMP estimates, we use a de jure measure based on the average unemployment benefit replacement rate, which is likely to be less endogenous to the cyclical fluctuations than actual spending in PLMPs.

28. Crucially, the role of time invariant policies cannot be identified because they are absorbed in the country fixed effects. For example, housing policies that facilitate residential mobility can affect the functioning of labour markets and matching of skills to jobs (Caldera Sanchez and Andrews, 2010; Adalet McGowan and Andrews, 2015b). Since housing policy indicators are only available for 2009, we examine their potential relevance by exploring the role of residential mobility as a potential channel for re-employment for workers displaced through firm exit.

4.2 Identifying the role of mobility

29. To explore the potential channels which shape the re-employment prospects of workers that lose their job through plant/office closure ($EMP_{i,c,t}$), we estimate the following model:

$$EMP_{i,c,t} = \alpha + \beta_1 X_{i,c,t} + \beta_2 Mobility_{i,c,t} + \delta_c + \delta_t + \varepsilon_{i,c,t} \qquad (2)$$

Where: all terms are the same as in equation (1), with the exception of $Mobility_{i,c,t}$ which is a dummy variable that takes the value of 1 if an individual moves to another region within one year after job loss due to plant/office closure; or zero otherwise.[19]

30. One concern is that the coefficient on *Mobility* may be biased upwards if mobility and re-employment prospects are positively correlated with an omitted factor, such as unobserved ability. To address this issue, we first control for the level of educational attainment and cognitive skills in a smaller sample for which this information is available. Secondly, we experimented with an instrumental variables strategy, whereby the mobility of individual *i* is instrumented by the predicted: *i*) country-specific probability of observing mobility in a certain year; and *ii*) age-specific probability of observing mobility for each country. The predicted probabilities are computed using a sample of individuals which have not experienced job loss due to business closure in their working life.

5. Empirical results

5.1 The role of policies

5.1.1 Baseline results

31. Table 1 contains the baseline estimates. Three key results emerge.

17. Suppose that ALMP spending had no effect on unemployment: if ALMP spending rises (because of reverse causality) less than proportionally with unemployment, there would be a positive correlation between ALMP spending as a ratio of unemployment, and the employment rate (see Estevao, 2003).

18. Given that, ceteris paribus, ALMP spending rises and GDP declines with an increase in unemployment, the estimated coefficient of (ALMP/ GDP) in the re-employment equation is biased downward toward zero.

19. The region is defined at the NUTS 1 level (see http://ec.europa.eu/eurostat/web/nuts/overview). We focus on regional mobility in order to abstract from changes in residential mobility that result from downsizing to more affordable housing. Future empirical work will aim to explore the issue of mobility more deeply, and focus on various types of mobility.

32. First, higher expenditure on active labour market policies (ALMPs) as a per cent of GDP is associated with a high probability of re-employment one year after plant closure (column 1). The same is true for the public employment services and administration (column 2), while the coefficient of other ALMPs is positive but only statistically significant at the 11% level (column 3). The latter includes spending on training, employment incentives, sheltered and supported employment and rehabilitation, direct job creation and start-up incentives.[20] These results are consistent with most cross-country aggregate evidence, which shows that ALMP spending can reduce unemployment (Martin, 2014), and microeconomic evaluations, which uncover favourable effects of job search assistance (JSA) and training on employment, albeit over varying timeframes (Card et al., 2010).

Table 1. Public policies and the re-employment probability: baseline estimates

Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; OLS estimation

	Active measures			***Passive measures***			***Tax wedge***
	1	2	3	4	5	6	7
Active measures							
ALMP (% of GDP)	0.165**						
	(0.0735)						
Placement and administration services		1.340***					
		(0.315)					
Other ALMP			0.107				
			(0.0662)				
Passive measures							
PLMP (% of GDP)				-0.123***			
				(0.0250)			
Out of work income support					-0.110***		
					(0.0260)		
Average Unemployment benefit replacement rate (%)						-0.00485*	
						(0.00249)	
Average tax wedge							-0.0213***
							(0.00688)
Demographic controls	YES	YES	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Number of observations	1374	1374	1437	1437	1437	1435	1148
R-squared	0.135	0.140	0.135	0.145	0.143	0.136	0.141

Notes: The model is based on a sample of displaced workers in 13 OECD Countries over 1986-2008. Active and passive measures are expressed as a per cent of GDP, with the exception of the unemployment benefit duration rate. Other ALMPs includes spending on training, employment incentives, sheltered and supported employment and rehabilitation, direct job creation and start-up incentives. Robust standard errors clustered at the country-five year period level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively. The constant term is not shown for sake of brevity.

33. Second, higher expenditure on passive labour market policies (PLMPs) as a per cent of GDP is associated with a lower probability of re-employment one year after plant closure (column 4). The same is

20. Since detailed information on the different components of labour market policies are only available for a limited number of country-year observations, we focus solely on the aggregate indicators.

true for higher spending on out of work income support as a per cent of GDP (column 5) and the average unemployment benefit duration (column 6). Additional analysis suggests that the negative link between spending on PLMPs and the re-employment probability is much stronger for older workers (Table B3).[21] One interpretation of these results is that more generous PLMPs may reduce re-employment probabilities of displaced workers by raising their reservation wage. However, it is important to note that some degree of passive spending will still be optimal in order to facilitate consumption smoothing and efficient job matching, although evidence on the relationship between benefit provision and job match quality is mixed (Tatsiramos, 2014).[22]

34. Third, a lower tax wedge between the labour cost and take-home pay for a one-earner married couple is associated with a higher probability of re-employment (column 7), consistent with existing evidence that reductions in the tax wedge can stimulate labour demand.

35. These results are robust to: *i*) industry fixed effects to control for time invariant industry-specific differences in labour market dynamics that may arise due to technological differences (Table B5); *ii*) including the output gap to further control for cyclical influences (Table B5); *iii*) controlling for product and labour market regulations (Table B4); *iv*) other *de jure* measures of PLMPs, including the average unemployment benefit duration (Table B6); *v*) expressing expenditure on labour market programs spending per unemployed as a percentage of GDP per capita (Table B6); *vi*) including multiple policies at the same time (Table B7); *vii*) controlling for education and skills (Table B8); *viii*) alternative definitions of the tax wedge; and *ix*) an clustering the standard errors at the country-year level, as opposed to the country-five year period level (Table B9).[23]

36. Figures 5-7 simulate the impact of selected policy reforms on the probability of re-employment. This involves calculating the difference between two estimates: *i*) the predicted re-employment probability for a certain type of individual (i.e. a married female aged 55 years) under the average policy regime that was actually observed in each country over the period 1986-2008; and *ii*) the predicted re-employment probability for the same individual under an alternative policy regime, outlined in more detail below.

37. Figure 5 Panel A estimates the impact of increasing public expenditure on ALMPs to 1.5% of GDP – roughly equivalent to the average of the three highest spending countries in the sample. On average, this policy reform is associated with an increase in the predicted re-employment probability of 14 percentage points. But the estimated impact is much higher in a number of countries where ALMP spending is relatively low, exceeding 20 percentage points in the Czech Republic and Greece, for example. However, some caution is warranted in interpreting these estimates, given that ALMP spending in these countries averaged only 0.25% of GDP over the sample period.

38. As an alternative, Figure 5, Panel B simulates the impact of a hypothetical (budget) revenue-neutral reform that keeps overall spending on labour market programs as a share of GDP constant, but shifts the composition of labour market spending towards ALMPs at the expense of PLMPs. For each country, the ratio of ALMP to PLMP spending is increased to 0.67 – the average ratio of ALMP to PLMP

21. The estimates in Table B3 imply that 1% increase in PLMP (% of GDP) would be associated with a 6 percentage point reduction in the re-employment probability for an individual aged 40 years and a 15 percentage point reduction in the re-employment probability for an individual aged 55 years.

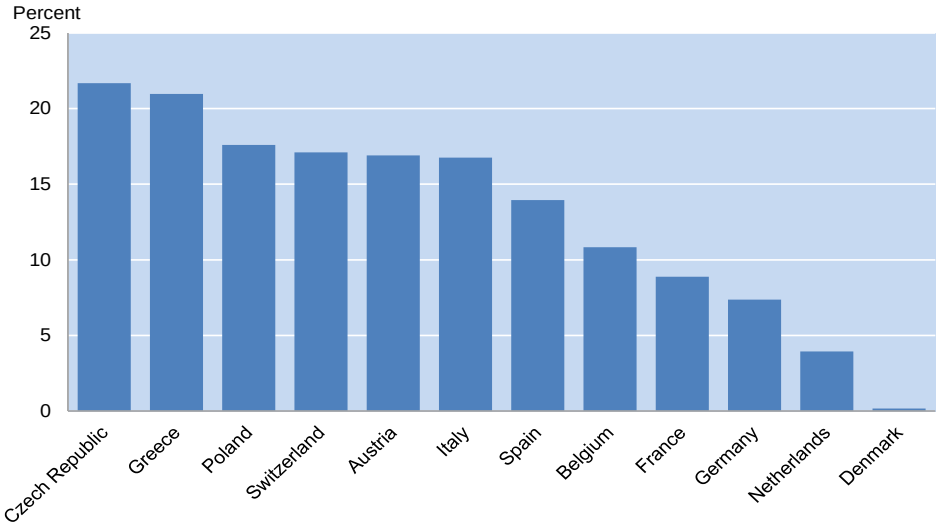
22. As an extension, we tested whether the negative impact of increases in spending on PLMPs on re-employment probabilities through time was smaller in countries with lower overall spending on PLMPs as a share of GDP, but there was no evidence to support this non-linearity.

23. These include the tax wedge calculated for a single worker and for a one-earner married couple with two children, although the latter results in a non-trivial reduction in sample size.

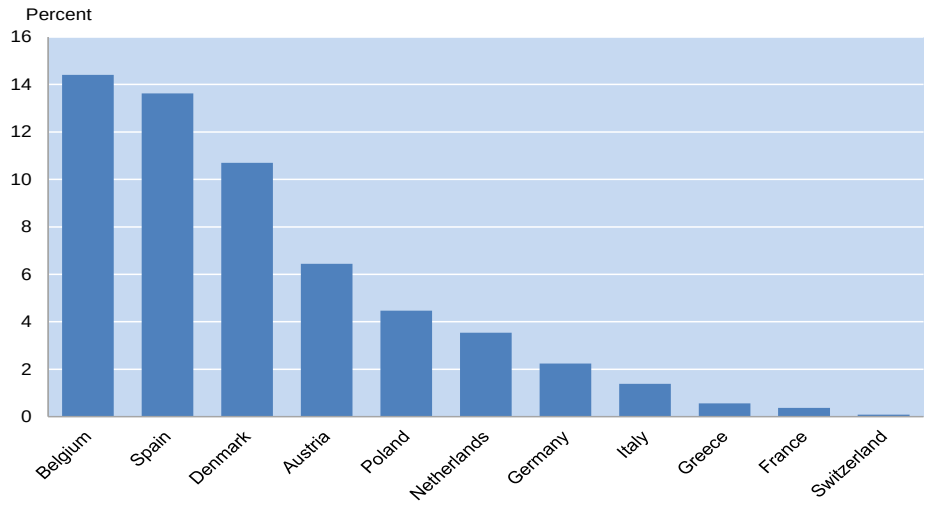
spending for the three highest countries, excluding Sweden. On average, this policy reform is associated with an increase in the predicted re-employment probability of 5 percentage points, but simulated gains are much larger in Belgium and Spain where the resources devoted to passive measure greatly exceed those allocated to ALMPs on average over the sample period (see Figure 2).

Figure 5. Impact of higher spending on ALMPs on the re-employment probability

A: Impact of increasing spending ALMP to 1.5% of GDP



B: Impact of shifting the composition of spending towards ALMP at expense of PLMP

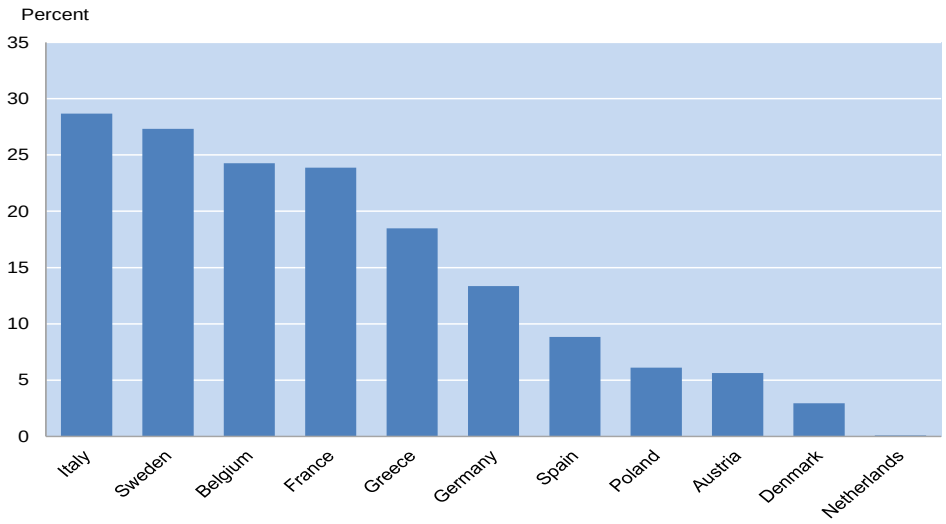


Notes: Panel A simulates the percentage point impact on the re-employment probability of increasing spending on ALMP programs to 1.5% of GDP, relative to the model's prediction based on the existing country-specific level of ALMP spending. The exercise uses coefficients from column 1 of Table 1. The implied estimates for Sweden are negative and thus omitted for presentational purposes since ALMP spending exceeds 1.5% of GDP. Panel B simulates the impact on the re-employment probability of shifting the composition of labour market spending towards ALMPs at the expense of PLMPs. For each country, the ratio of ALMP to PLMP spending is increased to 0.67 keeping the overall spending on labour market programs as a share of GDP constant. The exercise uses coefficients from column 1 of Table B6. The implied estimates for Sweden and the Czech Republic are negative and thus omitted for presentational purposes since the ratio of ALMP to PLMP spending exceeds the target level of 0.67 during the sample period.

39. The estimates in Table 1 imply that a reduction in the tax wedge by 5 percentage points is associated with a 10 percentage point increase in the probability of re-employment. However, the average

level of the tax wedge over the sample period varies significantly across countries, ranging from an average value of 11% in Switzerland to 42% in Sweden and Italy (Figure 2). Accordingly, Figure 6 simulates the effect of a reduction in the average tax wedge to 30% – roughly equivalent to the average of value of the three lowest countries, excluding Switzerland. All else equal, this policy reform would be associated with an increase in the probability of re-employment by around 20 percentage points in countries where the tax wedge was relatively high over the sample period, such as Sweden, Italy and France.

Figure 6. Impact of reducing the tax wedge to 30% on the re-employment probability



Notes: The chart simulates the impact on the re-employment probability of decreasing tax wedge to 30%, relative to the model's prediction based on the existing country-specific level of the tax wedge. The exercise uses coefficients from column 7 of Table 1. The implied estimates for the Czech Republic and Switzerland are negative and thus omitted for presentational purposes since the policy experiment implies an increase in the tax wedge in these countries.

5.1.2 The impact of policies and reason for worker displacement

40. For purposes of comparison, we re-estimated the econometric specification presented in the previous section for the individuals who lost their job due to the other involuntary reasons discussed in Section 3. Similar to the results reported in the previous section, the results presented in Table 2 suggest that higher spending on ALMP and lower spending on PLMP are associated with higher probability of re-employment for our second set of workers. However, the estimated economic magnitude of these policies is typically smaller in comparison to the baseline results with focus on the sample of workers who lost their job due to plant closure.

41. Figure 7 estimates the impact of a 1% increase the level of public expenditure on ALMPs (as a share of GDP) for the two types of workers: individuals who lost their job due to business closure and individuals who lost their job due to the other involuntary reasons. On average, this policy reform is associated with an increase in the predicted re-employment probability for both workers. However, the estimated impact for workers who lost their job due to business closure is about twice as large as the estimated impact for other workers. Given the political salience of job loss due to firm exit and the limited fiscal room to manoeuvre in many OECD countries, these results suggest that there may be a case to tailor ALMP expenditures toward workers displaced by firm exit, as opposed to workers displaced due to other involuntary reasons.

Table 2. Public policies and the re-employment probability: by reason for displacement

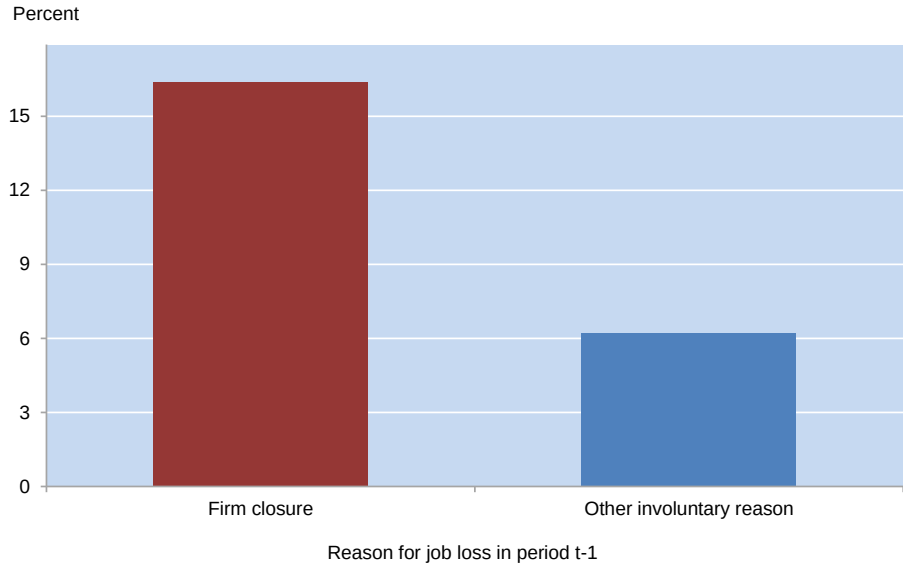
Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; OLS estimation

	Plant Closure 1	Other Workers 2	Plant Closure 3	Other Workers 4	Plant Closure 5	Other Workers 6
ALMP (% of GDP)	0.165**	0.0499*			0.164***	0.0620***
	(0.0735)	(0.0267)			(0.0530)	(0.0222)
PLMP (% of GDP)			-0.123***	-0.0608***	-0.123***	-0.0653***
			(0.0250)	(0.0140)	(0.0251)	(0.0136)
Test of equality across type of workers (p-values)						
ALMP (% of GDP)		0.087				0.0586
PLMP (% of GDP)				0.0064		0.0106
Demographic controls	YES	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Number of observations	1374	4549	1437	4667	1374	4549
R-squared	0.135	0.180	0.145	0.183	0.146	0.183

Notes: The model is based on a sample of displaced workers in 13 OECD Countries over 1986-2008. The odd (even) number columns explore the link between policies and the re-employment probability for workers displaced due to plant closure (other involuntary reasons). Active and passive measures are expressed as a per cent of GDP. Robust standard errors clustered at the country-five year period level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively. The constant term is not shown for sake of brevity.

Figure 7. The impact ALMPs on the re-employment probability varies with the reason for displacement

Impact of a 1% increase in ALMP spending (as a % of GDP) on the re-employment probability of displaced workers



Notes: The chart simulates the percentage point impact on the re-employment probability of a 1% increase in spending on ALMP programs (as a share of GDP) for the two types of workers: individuals who lost their job due to business closure (red bar) and individuals who lost their job due to the other involuntary reasons discussed above (blue bar). The exercise uses coefficients from Columns 5 and 6 of Table 2.

5.1.3 Policy complementarities

42. Table 3 provides evidence of potential policy complementarities between spending on ALMPs and entry barriers, proxied by administrative barriers to market entry in the energy, transport and communications. The variables are mean-centred, so the separate coefficient on ALMP (entry barriers) shows the incremental effect of raising ALMP (entry barriers) when entry barriers (ALMP) is at the sample mean over the period of analysis. Focusing on Column 2, the interaction term between spending on ALMP (% of GDP) and entry barriers is negative, suggesting that the positive impact of ALMP spending on the re-employment probability diminishes at higher levels of entry barriers. This finding may reflect the tendency for policy reforms that lower entry barriers in product markets to stimulate labour demand (Bertrand and Kramarz, 2002), which is likely to be complementary with ALMPs. Digging deeper, this result is mainly driven by the Other ALMP sub-component (Column 6), while the interaction between the Placement and Administrative Services and entry barriers is negative, but not quite significant at conventional levels (Column 4).

43. The estimates imply that for country with an average level of administrative entry barriers, a 1% increase in spending on ALMPs (as a share of GDP) is associated with an increase of 16 percentage points in the re-employment probability for workers displaced due business closure (Figure 8). However, for a country with low entry barriers (e.g. Sweden), the same increase in ALMP spending is associated with a 23 percentage points increase in the re-employment probability, while the re-employment probability rises by only 11 percentage points in a country with high entry barriers (e.g. Greece).

Table 3. ALMPs, entry barriers and the re-employment probability

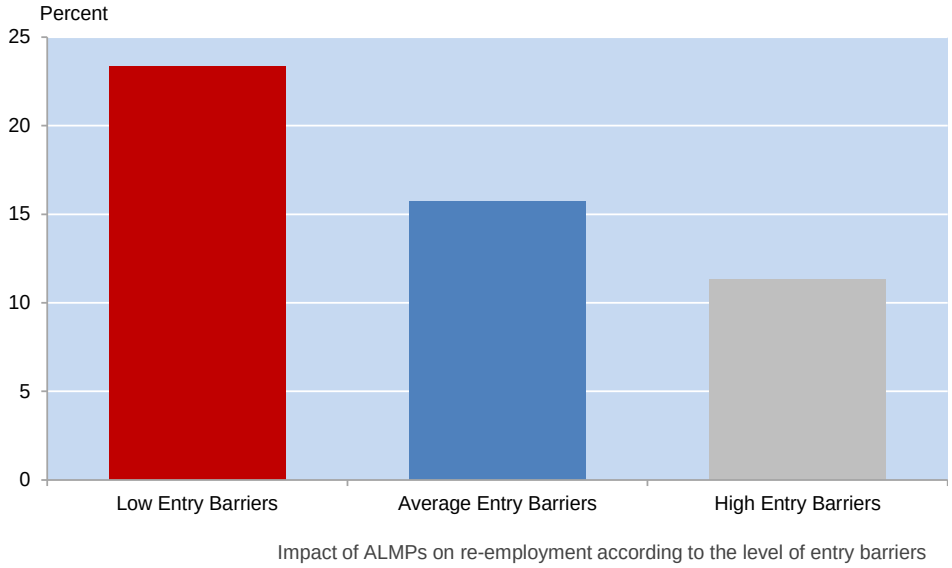
Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; OLS estimation

	j=ALMP (%GDP)		j=Placement and Administration Services (%GDP)		j=Other ALMP (%GDP)	
	1	2	3	4	5	6
$ALMP^j$	0.162**	0.157***	1.336***	1.344***	0.0945	0.118*
	(0.0711)	(0.0575)	(0.329)	(0.320)	(0.0630)	(0.0609)
Entry Barriers	0.00878	0.0226	0.00247	0.00248	-0.00639	0.0143
	(0.0343)	(0.0321)	(0.0322)	(0.0322)	(0.0374)	(0.0337)
$ALMP^j$ X Entry Barriers		-0.0462***		0.00628		-0.0576***
		(0.0152)		(0.106)		(0.0182)
Demographic controls	YES	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Number of observations	1188	1188	1188	1188	1251	1251
R-squared	0.149	0.154	0.155	0.155	0.148	0.154

Notes: The model is based on a sample of displaced workers in 13 OECD Countries over 1986-2008. The table shows the link between the re-employment probability, spending on active labour market policies (ALMPs) and entry barriers, for the three different measures of ALMPs (j=3). Other ALMPs includes spending on training, employment incentives, sheltered and supported employment and rehabilitation, direct job creation and start-up incentives. Entry barriers refers to the administrative barriers to market entry sub-component of the OECD energy, transport and communications (ETRC) product market regulation index. Robust standard errors clustered at the country-five year period level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively. The constant term is not shown for sake of brevity.

Figure 8. Entry barriers in product markets shape the impact of ALMP spending on the re-employment probability

Impact of a 1% increase in ALMP spending (as a % of GDP) on the re-employment probability of workers displaced due to firm exit



Notes: The bars show the percentage point impact on the re-employment probability of a 1% increase in spending on ALMPs (as a share of GDP) for three levels of entry barriers: *i*) the level corresponding to the average of the two best performing countries over the sample period (red bar); *ii*) the average level observed over the sample period (blue bar); and *iii*) the level corresponding to the average of the two worst performing countries over the sample period (grey bar). The exercise uses coefficients from column 2 of Table 3.

44. Finally, one limitation of our ALMP variable is that it only measures the quantity of spending, but clearly the quality of spending will be important. Indeed, it is likely that the effectiveness of a given unit of spending of ALMPs on boosting the re-employment probability will be higher in environments where the public sector efficiency is higher. To test this hypothesis, we interacted our ALMP variable with a measure of government effectiveness, sourced from from the Worldwide Governance Indicators (WGI), in Table B10.[24] Unfortunately, since WGI indicators are only available from 1996, the sample size falls by over one-half relative to the baseline estimates in Table 1 so these estimates should be viewed as purely illustrative. Nothwistanding these caveats, the interaction term is positive and statistically signficiant, consistent with notion that ALMP spending is more effective in raising the re-employment prospects of displaced workers in countries where public administration is more efficient.

5.1.4 Unreported results

45. Unreported results include additional explorations of the impact of policies such as employment protection legislation, pension replacement rates, the legally mandated retirement age and trade unionism. We also tested whether the impact of policies on re-employment probabilities varied with the stage of the business cycle, by including interactions between policy variables and the output gap. These results were generally inconclusive. However, this does not necessarily imply that such policies are irrelevant but could instead reflect data limitations.

24. This variable captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

5.2 The role of mobility

46. Table 4 shows the estimates of equation (2). The results suggest that individuals who changed region within one year after job loss due to business closure are more likely to have become re-employed. One identification concern is that the estimated coefficient on the mobility term may be upwardly biased if mobility and re-employment prospects are positively correlated with an omitted factor, such as unobserved ability. Accordingly, column 4 includes measures of education attainment and cognitive skills in a smaller sample for which this information is available but the coefficient on mobility is little changed compared to the column 3 (which estimates the baseline model on the smaller sample for which education and numeracy data are available).

47. Regarding economic magnitudes, the coefficient estimates imply that individuals which changed residence are 7-15 percentage points more likely to have found a job following displacement due to firm closure, relative to immobile displaced workers. This effect is economically significant, given an average re-employment probability of 56% observed over the period 1986-2008, and as discussed below, suggests that the design of housing policies may also be relevant.

Table 4. Mobility and the re-employment probability

Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; OLS estimation

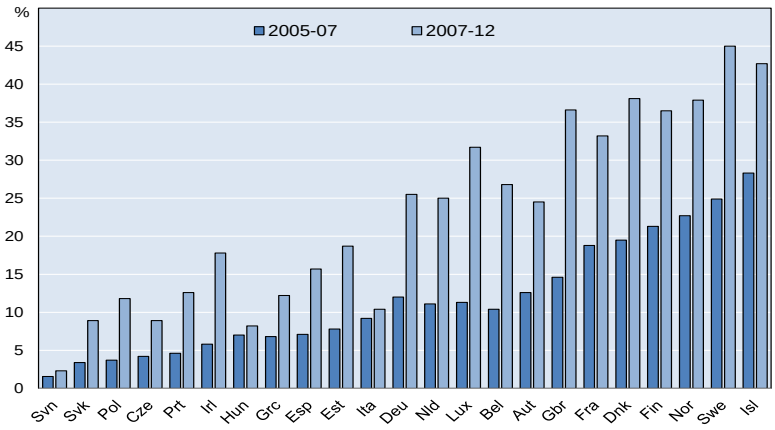
	1	2	3	4
Residential mobility	0.187*** (0.0412)	0.0744** (0.0368)	0.144** (0.0648)	0.152** (0.0680)
Demographic controls	NO	YES	YES	YES
Country Fixed Effects	NO	YES	YES	YES
Year Fixed Effects	NO	YES	YES	YES
Educational attainment	NO	NO	NO	YES
Cognitive skills	NO	NO	NO	YES
R-squared	2917	2917	1171	1171
Number of observations	0.004	0.165	0.171	0.189

Notes: The table shows the link between the re-employment probability and residential mobility, which equals 1 if an individual changes residence within one year after job loss due to business closure. Robust standard errors in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively.

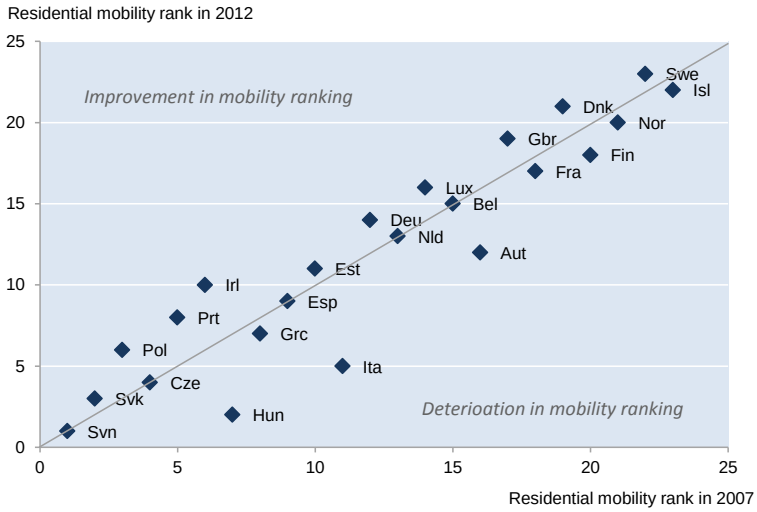
48. The positive effect of mobility on the re-employment prospects of displaced workers complements earlier OECD research which links cross-country differences in residential mobility to worker reallocation rates and skill mismatch (Andrews et al., 2011; Adalet McGowan and Andrews, 2015a). However, these studies are based on pre-crisis data, which raises the question of how mobility patterns have evolved since then. In this regard, new estimates based on data for the 5 years to 2012 suggest that cross-country differences in residential mobility remain significant (Figure 9, Panel A). While changes in survey design make direct comparisons over time difficult, some progress can be made by looking at changes in the cross-country rankings. These rankings are generally persistent, with high mobility rates still observed in Nordic countries and low mobility in southern and eastern European countries (Figure 9, Panel B). However, some churning has been evident, with Ireland, Poland and Portugal improving their ranking, while Italy, Hungary and Austria appear to have lost ground. Further analysis into the factors explaining these patterns looms as a fruitful area for research.

Figure 9. New evidence on residential mobility patterns in OECD countries

A: Percent of respondents aged 18-64 years that changed residence at least once over 2005-07 and 2007-12



B: Change in the cross-country residential mobility rate ranking between 2005-07 and 2007-12



Notes: The dark bar in Panel A shows the share of individuals in 2007 that change residence in the previous 2 years based on Caldera Sanchez and Andrews (2011), while the light bar shows the share of individuals in 2012 that change residence in the previous 5 years. In Panel B, each country is assigned a value based on its mobility rank in 2007 and 2012, ranging from a score of 1 for the country with the lowest mobility rate, up to 25 for the country with the highest mobility rate. The 45 degree line denotes no change in mobility rank between the two periods, while countries above and below the 45 degree line recorded an improvement and deterioration in their mobility ranking respectively.

Source: Authors calculations based on EU-SILC Microdata.

6. Policy discussion

49. Structural reforms which strengthen market selection, weed-out inefficient firms and trigger productivity-enhancing reallocation can have powerful effects on aggregate productivity growth. However, this process may entail costs to individuals and the political feasibility of such reforms will likely be enhanced if accompanied by policies which minimise the costs of worker displacement. Put differently, a policy framework that not only embraces the benefits of creative destruction, but also finds effective ways to cope with its costs is required. Accordingly, this paper explores the policy factors which shape the re-employment prospects of workers displaced by business closure with a view to identify the necessary policy ingredients to master "…the political economy of a market-oriented society that wishes to encourage economic restructuring" (Kletzer, 1998).

50. The results suggest that increases in spending on active labour market policies (ALMPs) are associated with a higher re-employment probability for displaced workers, while the opposite is true for passive labour market policies (PLMPs). While this strengthens the case for increasing resources devoted to ALMPs in some low spending countries, such programs entail a fiscal cost which must either be financed through distortionary taxation or offsetting reductions in other public spending.[25] With respect to the latter, a revenue-neutral policy reform which switched the composition of labour market expenditures more towards ALMPs could be desirable in countries where spending is overly tilted toward passive measures, although our results also suggest that the quality of spending matters. Even so, some degree of spending on passive measures is necessary from a consumption smoothing and job matching perspective. Moreover, given the political salience of job loss due to firm exit and the evidence that the re-employment prospects of such workers are more responsive to ALMPs than other displaced workers, there may be a case to better tailor ALMP expenditures toward workers displaced by firm exit.

51. Structural reforms which stimulate labour demand emerge as complementary to ALMPs. The effectiveness of ALMPs is significantly enhanced by reforms that lower entry barriers in product markets and improve the efficiency of government. Reductions in the tax wedge between labour cost and take-home pay are also associated with a higher re-employment probability for workers displaced by business closure.

52. Finally, even though the contribution of housing policies cannot be directly inferred due to a lack of time variation in these indicators, regional mobility emerges as a possible channel through which workers that lose their job due to plant closure become re-employed. This suggests a need for policymakers to cast a wider net, and to address a range of policy-induced distortions in housing markets that hinder residential mobility. These include high transaction taxes on buying and selling of dwellings, stringent land-use regulations, rent controls and other regulations that are overly generous to incumbent tenants (Caldera Sanchez and Andrews, 2011). Policy weakness in these areas is also associated with high rates of skill mismatch, which constitutes a significant drag on labour productivity in that it constrains the growth of the most productive firms (Adalet McGowan and Andrews, 2015a, 2015b).

53. To the best of our knowledge, this is the first paper to explore the link between policies and the costs of displacement due to firm exit in a cross-country setting and a number of avenues emerge for future research. First, focusing on the re-employment probability provides a reasonable first approximation in light evidence that the time spent out of work accounts for most of the loss in annual earnings after displacement. As more data becomes available, however, it will be important to provide a more complete picture of the costs of displacement and study what happens to the wages, working hours and skill use of workers displaced due to firm exit upon re-employment. Second, given the requirement for long time series, the analysis employs relatively aggregated measures on spending on ALMPs, but future research could explore the contribution of the various sub-components of ALMP spending to the re-employment probabilities of displaced workers. Third, future research will explore in more detail the impact of residential mobility on the costs of displacement and how policies shape this process. In this regard, efforts to update the OECD housing policy indicators would be of considerable value, given the important links between housing policies and labour market outcomes.

25. At the same time, a positive impact of ALMPs on re-employment at the micro-level may not automatically translate into a positive effect at the macro level if there are substitution effects; for example, displaced workers benefiting from ALMPs may crowd-out the re-employment prospects of other unemployed individuals who do not benefit from the program.

REFERENCES

Akerlof, G., A. Rose, and J. Yellen (1988), "Job Switching and Job Satisfaction in the U.S. Labor Market," *Brookings Papers on Economic Activity*, 2, 495-594.

Adalet McGowan, M. and D. Andrews (2015a), "Labour Market Mismatch and Labour Productivity: Evidence from PIAAC Data", OECD Economics Department Working Papers, OECD Publishing, Paris, No. 1209, http://dx.doi.org/10.1787/5js1pzx1r2kb-en.

Adalet McGowan, M and D. Andrews (2015b), "Skill mismatch and public policy in OECD countries", *OECD Economics Department Working Paper*, No. 1210.

Adalet McGowan, M., D. Andrews and V. Millot (2016), "The Walking Dead? Zombie Firms and Productivity Performance in OECD countries", OECD Economics Department Working Paper *forthcoming*.

Aghion, P (2016), Remarks at the *Policy Forum on the Future of Work*, Employment and Labour Ministerial Meeting 15 January 2016, OECD Paris.

Andrews, D., E. Bartelsman and C. Criscuolo (2015), "Firm Dynamics and Productivity Growth in Europe", Mimeo.

Andrews, D., A. Caldera Sánchez and Å. Johansson (2011), "Housing Markets and Structural Policies in OECD Countries", *OECD Economics Department Working Paper*s, No. 836.

Andrews, D. and F. Cingano (2014), "Public Policy and Resource Allocation: Evidence from Firms in OECD Countries", *Economic Policy*, No. 29(78), pp. 253-296.

Andrews, D., C. Criscuolo and P. Gal (2015), "Frontier Firms, Technology Diffusion and Public Policy: Micro Evidence from OECD Countries", OECD Productivity Working Papers, 2015-02, OECD Publishing, Paris, www.oecd.org/eco/growth/Frontier-firmstechnology-diffusion-and-public-policy-OECD-productivity-working-papers.pdf .

Andrews, D., C. Criscuolo and C. Menon (2014), "Do Resources Flow to Patenting Firms?: Cross-Country Evidence from Firm Level Data", OECD Economics Department Working Papers, No. 1127, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jz2lpmk0gs6-en.

Bassanini, A. and R Duval (2006), "Employment Patterns in OECD Countries: Reassessing the Role of Policies and Institutions", OECD Social, Employment and Migration Working Papers No. 35, OECD Publishing, Paris.

Bertrand, M. and Kramarz, F. (2002), "Does entry regulation hinder job creation? Evidence from the French retail industry", *Quarterly Journal of Economics*, 117(4), pp. 1369-1413.

Börsch-Supan, A., and M. Schröder (2011), "Retrospective Data Collection in the Survey of Health, Ageing and Retirement in Europe", in: M. Schröder, *Retrospective Data Collection in the Survey of Health, Ageing and Retirement in Europe – SHARELIFE Methodology*, pp. 5-10.

Bouis, R., O. Causa, L. Demmou, R. Duval and A. Zdzienicka (2012), "The Short-Term Effects of Structural Reforms: An Empirical Analysis", *OECD Economics Department Working Papers*, No. 949, OECD Publishing.

Caldera Sánchez, A. and. D. Andrews (2011), "To Move or not to Move: What Drives Residential Mobility Rates in the OECD?", OECD Economics Department Working Papers, No. 846, OECD Publishing, Paris, http://dx.doi.org/10.1787/5kghtc7kzx21-en.

Caldera-Sanchez, A., A. De Serres and Yashiro, N. (2016), "Pursuing Structural Reforms in a Difficult Macro Context: What Should Be the Priority?", *OECD Economics Department Working Papers*, forthcoming.

Card, D., J. Kluve and A Weber (2010), "Active Labour Market Policy Evaluation: a Meta-Analysis", *Economic Journal* 120, F452-F477.

Carrington, W.J and B.C. Fallick (2014), "Why Do Earnings Fall with Job Displacement?", Federal Reserve Bank of Cleveland, Working Paper No. 14-05.

Cournède, B., O. Denk and P. Garda (2016), "Worker-level effects of flexibility-enhancing reforms on transitions out of and into employment," *OECD Economics Department Working Papers*, forthcoming.

Criscuolo, C., P. Gal and C. Menon (2014), "The Dynamics of Employment Growth: New Evidence from 18 Countries", OECD Science, Technology and Industry Policy Papers, No. 14, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jz417hj6hg6-en.

Davis, S. and J. Haltiwanger (2014), "Labor Market Fluidity and Economic Performance", NBER Working Papers, No. 20479.

Davis, S.J. and T. von Wachter (2011), "Recessions and the Costs of Job Loss," *Brookings Papers on Economic Activity*, 43(2), pp. 1-72.

Denk, O (2016), "How policy reforms affect workers: Evidence from the deregulation of network industries," *OECD Economics Department Working Papers*, forthcoming.

de Serres, A. and P. Gal (2015), "Evidence on the Aggregate Employment Effects of Product Market Reforms: Which Types of Regulation Matter Most?", Presentation at the KDI-WB International Workshop, 12 November 2015, Washington DC.

Dewey, M., and M. Prince (2005) "Cognitive function", in *Health, Aging and Retirement in Europe: First Results from the Survey of Health, Aging and Retirement in Europe*, eds. A. Börsch-Supan, A. Brugiavini, H. Jurges, J. Mackenbach, J. Siegrist, and G. Weber (Mannheim: Mannheim Research Institute for the Economics of Aging), pp. 118–125.

Estevao, M. (2003), Do Active Labour Market Policies Increase Employment?, *IMF Working Paper, WP/03/234, December*.

Gal, P. and A. Theising (2015), "The Macroeconomic Impact of Structural Policies on Labour Market Outcomes in OECD countries", OECD Economics Department Working Papers, No. 1271.

Gopinath, G., S. Kalemli-Ozcan, L. Karabarbounis and C. Villegas-Sanchez (2015), "Capital Allocation and Productivity in South Europe", NBER Working Paper No. 21453.

Jacobson, L., R. LaLonde, and D. Sullivan (1993). "Earnings Losses of Displaced Workers." *American Economic Review*, 83(4), pp. 685-709.

Kletzer, L.G (1998), "Job Displacement", *Journal of Economic Perspectives* 12(1), pp. 115–136.

Martin, J (2014), "Activation and Labour Market Policies in OECD Countries: Stylized Facts and Evidence on Their Effectiveness", *IZA Policy Paper* No. 84.

Mortensen, D. and C. Pissarides (1994), "Job Creation and Job Destruction in the Theory of Unemployment," *Review of Economic Studies*, 61(3), pp. 397-415.

Murtin, F. and A. de Serres (2014), "How Do Policies Affect the Exit Rate out of Unemployment? Disentangling Job Creation from Labour Market Frictions," *Labour* 28(2), pp. 190-208.

Norton, EC, H. Wang and C. Ai (2004), "Computing interaction effects and standard errors in logit and Probit models" *Stata Journal* 4(2), pp. 154-167.

OECD (2015), *The Future of Productivity* OECD Publishing, Paris.

Quintini, G. and D. Venn (2013), *Back to Work: Re-employment, Earnings and Skill Use after Job Displacement*, OECD Publishing, Paris.

Schumpeter, J (1942*), Capitalism, Socialism and Democracy* Harper and Brothers, New York.

Sullivan, D and T. von Wachter (2009), "Job Displacement and Mortality: An Analysis Using Administrative Data," *Quarterly Journal of Economics*, 124(3), pp. 1265-1306.

Tatsiramos, K. (2014), "Unemployment benefits and job match quality", *IZA World of Labour* 44.

Topel, R.H. and M.P. Ward (1992), "Job Mobility and the Careers of Young Men", *Quarterly Journal of Economics*, Vol. 107, pp. 439-479.

von Wachter, T., E. Weber Handwerker and A. Hildreth (2009), "Estimating the "True" Cost of Job Loss: Evidence Using Matched Data from California 1991-2000", *Center for Economic Studies*, Working Papers, 09-14.

APPENDIX A: DATA SOURCES

Table A1. Details on policy variables used in the analysis

Variable	Definition	Source
ALMP	Placement and Administration, Training, Employment Incentives, Direct Job Creation and Start-up Incentives (i.e. Categories 10 - 70), (public expenditure as a percentage of GDP)	OECD Labour Market Programmes Database
Placement and Administration Services	Includes open information services, referral to opportunities for work, training and other forms of assistance, (public expenditure as a percentage of GDP)	OECD Labour Market Programmes Database
Othre ALMPs	Training, Employment Incentives, Direct Job Creation and Start-up Incentives (i.e. Categories 20 - 70), (public expenditure as a percentage of GDP)	OECD Labour Market Programmes Database
PLMP	Out-of-work income support and Early Retirement, (public expenditure as a percentage of GDP)	OECD Labour Market Programmes Database
Out of income support	Corresponds to public expenditure in unemployment benefits, redundancy compensation and bankruptcy compensation	OECD Labour Market Programmes Database
Unemployment Benefit Duration Rate	Unemployment benefit Duration (weeks)	Comparative Welfare Entitlements Dataset (CWED)
Average Tax Wedge	Tax wedge for one-earner married couple, splicing	OECD
Entry Barriers	Regulation in energy, trasport and communications, Entry Barriers	OECD

APPENDIX B: ADDITIONAL TABLES

Table B1. Reasons for job loss

Per cent of total; 1986-2008

	I resigned	I was laid off	By mutual agreement	My plant or office closed down	A temporary job had been completed	I retired	Other reason
Austria	33.1%	4.7%	8.6%	3.5%	4.3%	22.7%	23.2%
Belgium	34.8%	10.0%	9.7%	8.1%	3.5%	15.6%	18.2%
Czech Republic	23.5%	3.4%	19.9%	5.7%	0.8%	30.1%	16.5%
Denmark	56.8%	7.4%	12.5%	5.5%	4.4%	8.4%	5.0%
France	41.0%	9.3%	5.7%	4.3%	4.6%	16.2%	18.8%
Germany	35.4%	7.9%	11.2%	5.5%	4.7%	12.4%	22.8%
Greece	25.4%	1.9%	4.5%	4.7%	1.6%	48.1%	13.9%
Italy	45.9%	3.5%	6.5%	6.9%	2.7%	24.4%	10.3%
Netherlands	57.8%	6.4%	7.7%	2.9%	1.8%	8.4%	15.0%
Poland	23.1%	7.7%	22.7%	6.6%	1.7%	19.6%	18.6%
Spain	42.2%	3.5%	9.4%	6.4%	3.3%	19.1%	16.1%
Sweden	50.8%	3.5%	9.5%	2.5%	4.4%	13.1%	16.3%
Switzerland	65.6%	3.4%	5.0%	3.7%	3.1%	10.1%	9.0%
Other	55.6%	2.4%	10.3%	2.6%	7.2%	4.5%	17.6%
Minimum	*23.1%*	*1.9%*	*4.5%*	*2.5%*	*0.8%*	*4.5%*	*5.0%*
Average	*42.2%*	*5.3%*	*10.2%*	*4.9%*	*3.4%*	*18.0%*	*15.8%*
Maximum	*65.6%*	*10.0%*	*22.7%*	*8.1%*	*7.2%*	*48.1%*	*23.2%*

Table B2. Mean worker characteristics: business closure *vs* other involuntary reasons

	Displacement due to:		Difference in means (%)
	Business closure	Other involuntary reasons	
Firm tenure	11.1	8.25	35***
Age	39.88	33.71	18***
Cognitive Skills	3.44	3.54	-3***
Income Support			
Public Sources	53%	49%	8**
Partner & Family	56%	62%	-10**

Notes: ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively.

Table B3. Heterogeneous effects of labour market policies according to worker age

Dependent variable: the probability of re-employment one year after plant closure; OLS estimation

	j=PLMP (%GDP)	j=Out of work income support
	1	2
$PLMP^j$	-0.141***	-0.123***
	(0.0235)	(0.0246)
Age	-0.0128***	-0.0128***
	(0.00208)	(0.00212)
$PLMP^j$ X Age	-0.00397**	-0.0043**
	(0.00167)	(0.00193)
Demographic controls	YES	YES
Country Fixed Effects	YES	YES
Year Fixed Effects	YES	YES
R-squared	0.149	0.147
Number of observations	1437	1437

Notes: Robust standard errors clustered at the country-five year level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively.

Table B4. Robustness to the adoption of an alternative model

Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; probit estimation

	Active measures			*Passive measures*			*Tax wedge*
	1	2	3	4	5	6	7
Active measures							
ALMP (% of GDP)	0.457**						
	(0.207)						
Placement and administration services		4.065***					
		(1.000)					
Other ALMP			0.289				
			(0.181)				
Passive measures							
PLMP (% of GDP)				-0.370***			
				(0.0744)			
Out of work income support					-0.330***		
					(0.0770)		
Average Unemployment benefit replacement rate (%)						-0.0135*	
						(0.00701)	
Average tax wedge							-0.0597***
							(0.0196)
Demographic controls	YES	YES	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES
Number of observations	1372	1372	1435	1435	1435	1146	1433

Notes: Robust standard errors clustered at the country-five year period level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively.

Table B5. Robustness to the inclusion of additional controls

Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; OLS estimation

	Active measures						*Passive measures*						*Tax wedge*	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Active measures														
ALMP (% of GDP)	0.152**	0.141**												
	(0.0731)	(0.0631)												
Placement and administration services			0.152**	0.141**										
			(0.0731)	(0.0631)										
Other ALMP					0.0913	0.0847								
					(0.0646)	(0.0628)								
Passive measures														
PLMP (% of GDP)							-0.126***	-0.135***						
							(0.0249)	(0.0267)						
Out of work income support									-0.113***	-0.130***				
									(0.0257)	(0.0254)				
Average Unemployment benefit replacement rate (%)											-0.00493*	-0.00644**		
											(0.00250)	(0.00246)		
Average tax wedge													-0.0196***	-0.0151
													(0.00661)	(0.00902)
Demographic controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Output Gap	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
EPL	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
ETCR	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Number of observations	1372	1003	1372	1003	1435	1066	1435	1066	1435	1066	1147	1060	1433	1064
R-squared	0.146	0.168	0.152	0.172	0.146	0.163	0.157	0.173	0.155	0.174	0.153	0.166	0.147	0.160

Notes: Robust standard errors clustered at the country-five year period level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively.

Table B6. Robustness to alternative definitions of labour market policies

Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; OLS estimation

	Active measures		***Passive measures***					
	Plant Closure	Other Workers	Plant Closure	Other Workers	Plant Closure	Other Workers	Plant Closure	Other Workers
Active measures								
ALMP spending per unemployed as % of GDP per capita	0.00259**	0.000866***						
	(0.000973)	(0.000289)						
Passive measures								
Passive LMP spending per unemployed as a % of GDP per capita			-0.00495***	-0.00308***				
			(0.00167)	(0.00100)				
Income support spending per unemployed as a % of GDP per capita					-0.00355**	-0.00188*		
					(0.00157)	(0.000998)		
Unemployment benefit duration							-0.00125***	-0.000460***
							(0.000280)	(0.000160)
Demographic controls	YES	YES	YES	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Number of Observations	1395	4586	1388	4570	1388	4570	1161	3989
R-squared	0.138	0.182	0.140	0.184	0.137	0.182	0.149	0.187

Notes: Robust standard errors clustered at the country-five year period level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively.

Table B7. Robustness to the inclusion of multiple policies

Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; OLS estimation

	1	2	3	4	5	6	7	8
Active measures								
ALMP (% of GDP)	0.164***		0.143***		0.158**			0.0491***
	(0.0530)		(0.0524)		(0.0694)			(0.0183)
Placement and administration services		0.817***		0.920***				
		(0.263)		(0.244)				
Other ALMP			0.289					
			(0.181)					
Passive measures								
PLMP (% of GDP)	-0.123***	-0.0959***				-0.118***		-0.0590***
	(0.0251)	(0.0241)				(0.0259)		(0.0143)
Out of work income support			-0.105***	-0.0829***				
			(0.0260)	(0.0229)				
Average Unemployment benefit replacement rate (%)					-0.00826**	-0.00535**	-0.0109***	
					(0.00391)	(0.00203)	(0.00289)	
Average tax wedge							-0.0352***	-0.00630*
							(0.00917)	(0.00351)
Demographic controls	YES	YES	YES	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	1374	1374	1374	1374	1062	1125	1123	4418
R-squared	0.146	0.146	0.144	0.145	0.145	0.153	0.147	0.181

Notes: Robust standard errors clustered at the country-five year period level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively.

Table B8. Robustness to controlling for education and skills

Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; OLS estimation

	Active measures						*Passive measures*						*Tax wedge*	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Active measures														
ALMP (% of GDP)	0.391*** (0.145)	0.465*** (0.162)												
Placement and administration services			2.233*** (0.399)	1.967*** (0.718)										
Other ALMP					0.190 (0.165)	0.236 (0.182)								
Passive measures														
PLMP (% of GDP)							-0.187*** (0.0344)	-0.267*** (0.0318)						
Out of work income support									-0.160*** (0.0363)	-0.253*** (0.0317)				
Average Unemployment benefit replacement rate (%)											-0.0141*** (0.00524)	-0.0138** (0.00537)		
Average tax wedge													-0.0291** (0.0126)	-0.0182 (0.0222)
Demographic controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO
Output Gap	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO
EPL	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO
ETCR	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO
Education Attainment	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Cognitive Skills	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	664	388	664	388	689	413	689	413	689	413	432	397	688	412
R-squared	0.182	0.243	0.196	0.250	0.172	0.221	0.197	0.267	0.191	0.265	0.206	0.238	0.180	0.217

Notes: Robust standard errors clustered at the country-five year period level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively.

Table B9. Robustness to alternative clustering: country-year level

Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; OLS estimation

	Active measures						*Passive measures*						*Tax wedge*	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Active measures														
ALMP (% of GDP)	0.165**	0.465***												
	(0.0818)	(0.178)												
Placement and administration services			1.340***	1.967***										
			(0.345)	(0.558)										
Other ALMP					0.107	0.236								
					(0.0848)	(0.197)								
Passive measures														
PLMP (% of GDP)							-0.123***	-0.267***						
							(0.0258)	(0.0457)						
Out of work income support									-0.110***	-0.253***				
									(0.0255)	(0.0458)				
Average Unemployment benefit replacement rate (%)											-0.00485*	-0.0138**		
											(0.00269)	(0.00538)		
Average tax wedge													-0.0213***	-0.0182
													(0.00755)	(0.0232)
Demographic controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Fixed Effects	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO
Output Gap	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO
EPL	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO
ETCR	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO
Education Attainment	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO
Cognitive Skills	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	YES	NO
Number of observations	1374	388	1374	388	1437	413	1437	413	1437	413	1148	397	1435	412
R-squared	0.135	0.243	0.140	0.250	0.135	0.221	0.145	0.267	0.143	0.265	0.141	0.238	0.136	0.217

Notes: Robust standard errors clustered at the country-year level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively.

Table B10. ALMPs, government effectiveness and the re-employment probability

Dependent variable: dummy variable that takes value 1 if an individual found a new job one year after plant closure; OLS estimation

	(1)	(2)
ALMP	0.139	0.0377
	(0.109)	(0.141)
Government Effectiveness	0.380*	0.515**
	(0.202)	(0.194)
ALMP X Government Effectiveness		0.357**
		(0.154)
Demographic controls	YES	YES
Country fixed effects	YES	YES
Year fixed effects	YES	YES
Number of Observations	623	623
R-squared	0.158	0.161

Notes: Robust standard errors clustered at the country-year level in parentheses. ***, ** and * denotes statistical significance at the 1%, 5% and 10% respectively. Government Effectiveness – sourced from the Worldwide Governance Indicators (WGI) – captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. A country's score on the aggregate indicator is conveyed in terms of units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.