Firm Dynamics and Employment Protection: Evidence from Sectoral Data*

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February 24, 2017

Abstract

We analyse the impact of employment protection legislation (EPL) on firms' entry and exit rates for a sample of industries in thirteen countries from the most recent version of the OECD Structural and Business Statistics Database. Using a difference-in-difference identification strategy, we find that more stringent EPL is associated to lower entry and exit in industries characterized by higher reallocation intensity. We also find that both collective and individual dismissal regulations reduce firms' entry and exit and that the negative effect of EPL is stronger in the case of small firms. An extensive robustness analysis confirms our main findings.

Keywords: Entry and exit, turnover, employment protection legislation, reallocation.
J.E.L. Classification: J65, L11, L26.

*We thank Lorenzo Cappellari, Claudio Lucifora and seminar participants at Università Cattolica in Milan, Joint Research Center of the European Commission in Ispra, 7th ICEEE Conference in Messina, 57th SIE Conference in Milan, XXVII SIEP Conference in Lecce and XXX AIEL Conference in Cagliari for comments and suggestions. We also thank Fabiano Schivardi for giving us access to his data. Part of this work has been been carried out while Sulis was visiting the University of New South Wales, Sydney: we thank that institution for its hospitality. The usual disclaimer applies. Contacts: Anna Bottasso, bottasso@economia.unige.it; Maurizio Conti, maurizio.conti@jrc.ec.europa.eu; Giovanni Sulis (corresponding author), Department of Economics and Business, University of Cagliari, Viale S. Ignazio da Laconi 78, 09123 Cagliari, Italy, gsulis@unica.it.

1 Introduction

Recently, a large and growing empirical and theoretical literature has ascribed to the misallocation of resources, potentially associated to the institutional and regulatory environment where firms operate, an important share of the cross-country differences in incomes and productivity (Restuccia and Rogerson, 2008; Hsieh and Klenow, 2009; Bartelsman et al, 2013; Hopenhayn and Rogerson, 1993; Poschke, 2009; among the others). In particular, this literature has highlighted the importance of static allocative efficiency (i.e., the extent to which more productive firms tend to have larger market shares) as a driver of cross-country productivity level differentials (Bartelsman et al., 2013; Andrews and Cingano, 2014). Other authors (e.g., Foster et al., 2001) have found that, in many countries, a sizeable share of productivity growth derives from reallocation of resources, within narrowly defined sectors, from low productivity to high productivity establishments (dynamic allocative efficiency). The above literature suggests that the efficiency of the allocative process might be dampened by distortions induced by labour and product market regulations, taxation, subsidies, trade restrictions or non-competitive banking systems. In this context, some recent papers by Haltiwanger et al. (2014) and Bassanini and Garnero (2013) have explicitly focused on the effect of employment protection legislation on reallocation and job/worker flows, suggesting that firing regulations have a determinant role in reducing the efficiency of the (re)allocation process.

As a matter of fact, resource reallocation can work through expansion and contraction of existing firms, or via the entry-exit channel: some studies have found that exiting firms are in general low productivity ones, while, if a sufficient window of time is allowed for, entering firms tend on average to become high productivity producers (or rapidly shrink and exit). Indeed, and leaving aside any measurement error issue (Foster et al., 2001), the "net entry" (i.e., entry less exit) component of reallocation seems to account for a non-negligible share of aggregate productivity growth. Some authors have found that, in the case of the US and over a five or ten-year horizon, at least one quarter of aggregate productivity growth is associated to the net entry component (Foster et al., 2008; Foster et al., 2001); i.e., to the exit of

low productivity firms and the entry and expansion of high productivity ones.[1] Moreover, there are non-negligible differences across countries: Bartelsman et al. (2009) show that net entry accounts for between one-fifth and one-half of aggregate productivity growth in a sample of OECD countries. This in turn suggests that such cross-country differences might be associated to country-level heterogeneity in government policies and institutions.[2]

In particular, some authors have studied the impact that labour and product market regulations, barriers to entry, taxation or financial development have on average entry and exit rates. For example, Klapper et al. (2006) and Ciccone and Papaioannou (2007) examine the impact of entry costs and regulation, Da Rin et al. (2011) study the effects of taxation of corporate income, while Samaniego (2010) focuses on the role played by technical change and entry costs.

As far as employment protection legislation (EPL) is concerned, a number of theoretical studies have considered its implications on firms' incentives to enter and exit. In a seminal paper Hopenhayn and Rogerson (1993) suggest that high labour adjustment costs reduce the present discounted value of profits and induce a lower pace of job and firm turnover. Similarly, Bertola (1994), by modelling firing costs as an adjustment friction, argues that they reduce the value of the firm and therefore firms' incentives to enter, *ceteris paribus*. Likewise, Koeniger and Prat (2007) show that firing costs reduce firm entry in their model because, by reducing the shadow value of labour, they increase the productivity threshold above which it is convenient to enter. Micco and Pagés (2007) consider a simple model where firms need to pay a sunk cost to enter the market and face quadratic employment adjustment costs; moreover, they allow firms to be hit by idiosyncratic revenue shocks whose variance varies across sectors. They show that employment protection legislation, proxied by labour adjustment costs, reduces job reallocation and, because firms cannot adjust to the optimal

[1] In some sectors, its contribution can be even higher. Foster et al. (2006) found that virtually all productivity growth in the US retail sector was due to entry of high productivity firms and to the exit of low productivity ones. In general, the contribution of net entry to productivity growth is larger in more technologically advanced sectors (Martin and Scarpetta, 2012).

[2] Although cross country differences in average entry and exit rates are not large (Bartelsman et al., 2009), this could be due to different regulations and/or institutions in place in different countries that have opposite impacts on entry and exit rates (see also Cabral, 2014).

level of employment every period and the value of entering the market is a decreasing function of the magnitude of adjustment costs, firm entry is also reduced. Moreover, they show that the impact of adjustment costs on firm entry tends to increase with the variance of the revenue shocks.

Overall, the consensus generally acknowledges that more rigid labor markets tend to deter entry and such prediction is mostly confirmed by the empirical literature. Some studies focus on single countries, like Autor et al. (2007) who find, using US data, that, after the introduction of the good faith exception (a form of common law exception to the "employment-at-will" doctrine consisting in the prohibition to employers to fire workers for a bad cause) the number of entering firms fell significantly. Slightly different results are obtained by Kugler and Pica (2008) who suggest that a 1990 reform in Italy - which increased EPL for small (below 15 employees) firms only - reduced entry of small firms relatively to larger ones. Using cross-country data, Aghion et al. (2007) find that EPL is associated to smaller entry rates particularly in industries that are naturally characterized by stronger labour reallocation (see also Scarpetta et al. 2002). Using a difference-in-difference approach, Micco and Pagés (2007) also find that more stringent EPL reduces both job turnover and firm entry particularly in high volatility sectors, that the authors proxy with job reallocation in the US. Similar results are obtained by Klapper et al. (2006) on a sample of European countries, who show that labor regulations have a dampening effect on entry, especially in sectors characterized by naturally high entry rates and induce an increase in the average size of potential entrants. Finally, Bartelsman et al. (2009) suggest that a rigid labour market might deter entry, especially in the case of small firms because the costs entailed by EPL have in general fixed components that are more binding in the case of small size enterprises.

By way of contrast, the theoretical literature on EPL and exit does not offer clear-cut conclusions. For instance, Poschke (2009), building on Samaniego (2006), models firing costs as both an adjustment cost and as a tax on exit: his theoretical model shows that, if firing costs are charged only to continuing firms, firing costs reduce the value of continuing operations and therefore increase exit, thereby positively contributing to selection and pro-

ductivity growth.[3] By way of contrast, if firing costs are levied both on continuing and exiting firms, they reduce the value of continuing but also the value of exit: however, the latter drops more because firing costs are to be borne immediately, thereby reducing exit, with respect to a benchmark economy with no firing costs. In this model, the negative impact of EPL on firm selection (and growth) is larger in sectors where firms face larger variance of idiosyncratic productivity shocks. This is because an higher variance of shocks implies that high (and low) productivity draws for firms are more likely: as a result, selection by exit should be more relevant in high-volatility than in low-volatility sectors. Therefore, in Poschke's (2009) model, by altering the incentives to exit, EPL tends to affect firm exit (and entry, for the same mechanisms) relatively more in the case of sectors where firm experience a larger variance of productivity shocks.

However, there might be other reasons to believe that EPL tends to reduce exit: for instance, in countries with rigid labour markets firms will tend to experiment less because of the adjustment costs entailed by high EPL, especially in sectors where experimentation is more important (e.g., those sectors that naturally require more labour reallocation, or those that use ICT more intensively). If this is indeed the case, firms in high EPL countries will use more stable and already experimented technologies and therefore we might expect fewer failures so that the exit rate might be lower, particularly in sectors requiring high flexibility. Furthermore, by reducing exit and keeping more low productivity firms alive, EPL might also deter entry, because resources (capital and labour) are not liberated by firms that would have otherwise exited in more flexible labour market environments (see Aghion et al., 2008).

The empirical literature on exit rates is really scant and does not offer clear cut predictions. To the best of our knowledge, the only studies available in the literature are the already mentioned single country studies by Autor et al. (2007), who use US industry panel data at the state level, and by Kugler and Pica (2008), who use Italian firm level panel data. Both studies however do not find any statistically significant effect of EPL on exit rates.

[3] A similar result is also found in the model of Koeniger and Prat (2007) where firing costs increase the productivity threshold below which it is convenient to exit, because they reduce the shadow value of labour and therefore the option of waiting.

We use the latest version of the OECD Structural and Business Statistics Database (ISIC Rev 3) and the standard OECD employment protection legislation indicators, in order to study whether firms' entry and exit decisions are affected by EPL in a cross section of 27 sectors of 13 OECD (EU) countries observed over the 2004-2007 period.

In particular, we use the Rajan and Zingales' (1998) difference-in-difference approach as an identification framework in order to analyse whether countries with stricter employment protection legislation have relatively lower firms' entry and exit rates in sectors that naturally require more flexibility in labour force adjustment, the latter proxied by industry level worker reallocation rates in the US.

Our identification strategy stems directly from the theoretical considerations on the effects of EPL on firms entry and exit discussed above. Indeed, in the model of Micco and Pagés (2007), EPL, by increasing labour adjustment costs, tends to weaken job reallocation: the suboptimal labour reallocation in turn reduces the value of entering into the market. Moreover, because adjustment costs are more binding in sectors with higher volatility of shocks, EPL should lower entry relatively more in high-volatility sectors. Similarly, in the model of Poschke (2009), by acting as a tax on exit, EPL might reduce exit and this effect is shown to be stronger in the case of high-volatility sectors.

In this theoretical framework, we proxy an industry intrinsic volatility with the worker reallocation rate in the US.[4] The use of US data is ubiquitous in the literature that has sought to estimate the impact of EPL on various firm and labour market outcomes using cross-country cross-industry data. The motivation is that the US has one of the most flexible labour markets in the OECD, and therefore the US industry worker reallocation rate is less likely to reflect the impact of employment protection legislation or other labour market institutions. However, the use of US industry data in order to capture an "intrinsic" industry-specific need for labour flexibility is surely not without problems: we refer to the rest of the paper for an extensive discussion of the limitations of the Rajan and Zingales' (1998) approach as well as for a description of the robustness checks we undertake in this paper.

[4]Aghion et al. (2007) and Micco and Pagés (2007) have analysed the impact of EPL on firm entry and have proxied industry volatility with US gross job flows and reallocation.

The main result of this study is that higher EPL is associated to both lower entry and exit rates in high worker reallocation industries. Moreover, we find that the additional burden imposed to firms in the case of collective dismissals has a further negative effect on top of that associated to stricter individual dismissal regulations. In turn, difficulty of dismissals seems to be the most important regulatory determinant. Interestingly, we also find some tentative evidence that the negative impact of EPL on exit rates is particularly strong in those countries where it is more likely that firing costs are also borne by exiting firms, as foreseen by Poschke's (2009) model. Finally, we find that the negative effects of EPL in reallocation intensive industries are larger in the case of small firms (those between 1 and 9 employees) while, in the case of larger ones (those with 10 or more employees), our results do not allow us to draw firm conclusions in the case of entry while, for exit, the impact of EPL is smaller but still statistically significant.

This paper is related to different strands of literature. First, it is in line with studies analysing the impact of EPL on job reallocation, like Haltiwanger et al. (2014) who find, using industry data for a set of emerging, industrial and transition economies observed over the 1990s, that stricter EPL reduces job reallocation (job creation plus job destruction), particularly in those industries and firm size classes that require "more frequent" labour adjustment. Interestingly, they find that this effect is particularly strong in the case of job reallocation originated by entry and exit of firms (the extensive margin) with respect to that due to reallocation among continuing firms. A similar study is that of Bassanini and Garnero (2013) on a set of OECD countries, who find that countries with stricter EPL tend to display lower within industry job-to-job transitions. Second, this work is associated to the empirical literature analysing the link between EPL and productivity growth, which generally finds a negative correlation between labour market rigidity and total factor productivity, particularly in sectors with higher reallocation intensity or in more innovative ones.[5] Finally, this study is linked to the empirical literature that has sought to study the impact of government

[5]See, among the others, Bassanini et al. (2009), Cingano et al. (2010), Autor et al. (2007) and Conti and Sulis (2016). However, see also Belot et al. (2007) who found a positive effect of EPL on per capita GDP and Acharya et al. (2013). See also Scarpetta and Martin (2012) for a literature review.

regulations on entry rates as well as to the industrial organization literature on entry and exit (Dunne et al., 1988; Caves, 1998; Santarelli and Vivarelli, 2007).

Our analysis contributes to the previous literature on different dimensions. First, it uses the latest version of the OECD Structural and Business Statistics Database, which measures entry and exit on a consistent basis across countries, and for a more recent period than virtually all recent empirical works on firm turnover. Second, to the best of our knowledge, this is the first paper that empirically analyses the link between employment protection legislation and firms' exit using cross-country cross-industry data. Related to this, this is the first study that provides a test of the main theoretical insight of Poschke's (2009) model, namely that EPL is more likely to reduce exit if firing costs are borne by both continuing and exiting firms. Third, with respect to previous empirical evidence on the relationship between EPL and firm entry using industry data, we consider a different sample as well as time period and, more importantly, we disentangle the role of different regulatory provisions (e.g., individual versus collective dismissals and the their disaggregated components) and provide a more extensive battery of robustness checks. Fourth, in order to take into account cross country variations in the degrees of law enforcement, in most specifications we adjust the OECD EPL indicators with a variable that captures the efficiency and reliability of the law system.

Finally, although, as we recalled above, this study is strictly related to Haltiwanger et al. (2014), we believe that it is different along some dimensions. First, they study the effects of EPL on job flows associated to firm entry and exit, while we directly focus on firm entry and exit *per se*. This can be important because, although in some country-industry cells job flows associated to firm entry (exit) might be large, the actual number of entering (exiting) firms might be relatively low, if firms tend to enter (exit) on a relatively large scale. Given the existence of cross country differences along this dimension, it might be important to assess the impact of EPL on firm entry and exit. Second, with respect to Haltiwanger et al. (2014) we consider a very different sample (more geared towards OECD countries), a different time period, and a more extensive battery of robustness checks.

The remainder of the study is organized as follows. In Section 2 we describe our estimation and identification framework. In Section 3 we present the data. Section 4 contains the empirical results while Section 5 concludes. Additional results are available in the Appendix.

2 Estimation and identification strategy

Our empirical framework is based on the difference-in-difference approach proposed by Rajan and Zingales (1998) and subsequently employed in many other empirical applications.[6] This approach implies the estimation of the following equation:

$$Y_{s,c} = \alpha(Reallocation_s \times EPL_c) + \beta(W_s Z_c) + \lambda X_{s,c} + u_c + u_s + \nu_{s,c}. \quad (1)$$

Where $Y_{s,c}$ is the entry or exit rate in sector s of country c, $Reallocation_s$ is the worker reallocation rate of sector s in the US, EPL_c is the level of employment protection legislation in country c, W_s is a set of US industry characteristics, Z_c is a set of country level variables, $X_{s,c}$ is a set of variables that vary at both country and sector level, u_c is a country fixed effect, u_s is a sector fixed effect and $\nu_{s,c}$ is a standard error term.

A negative sign for the coefficient α of the interaction term $Reallocation_s \times EPL_c$ indicates that countries characterized by stronger EPL tend to have lower entry and exit rates in industries characterized by high reallocation intensity. It is important to stress that the Rajan and Zingales' (1998) approach only allows us to identify a differential effect between higher and lower reallocation intensive industries, and not a direct one. Still, this differential provides us with some indication on the direction of the average effect of employment protection legislation, subject to the identification assumption, which directly stems from the models surveyed above, that in low reallocation intensive sectors the effect of EPL is of the same sign and smaller than in high reallocation intensive industries or, alternatively, zero (Bassanini and Garnero, 2013).

The idea underlying the Rajan and Zingales's (1998) approach is that there are industries

[6]For studies on the impact of EPL and other labour market institutions, see Bassanini et al. (2009), Haltiwanger et al. (2014), Bassanini and Garnero (2013), Cardullo et al. (2015) and Conti and Sulis (2016).

that are more likely to be particularly "exposed" to a particular policy: such industries can be considered as a sort of "treatment" group, while those that are less exposed may act as "control" group.

It is important to note that the identification strategy behind equation (1) rests on two assumptions. The first is that worker reallocation intensity is a good "exposure" variable, i.e., that EPL is likely to be more binding in reallocation intensive sectors. We justify this on two grounds. First, equation (1) stems naturally from the models in Micco and Pagés (2007) and Poschke (2009), as they show that the impact of EPL on entry and exit, respectively, is an increasing function of sectoral volatility. In turn, because industries characterized by large shocks to revenue tend to also have higher hiring and separation rates (and therefore stronger labour flexibility requirements), the literature on the effects of EPL on job (and worker) flows, productivity and firm dynamics has often proxied industry volatility with industry layoff or job turnover intensity (Bassanini et al., 2009), job flows intensity (Haltiwanger et al., 2014; Micco and Pagés, 2007) or worker reallocation intensity (Bassanini and Garnero, 2013).

The second identification assumption concerns the use of US industry data in order to build a proxy for sectoral employment flexibility requirements. In particular, the use of US data is motivated by the fact that the US labour market is perhaps the most flexible, and therefore it can approximate the "natural" industry need for reallocation that would have emerged also in other countries if they were not characterized by higher levels of EPL. It is important to note that, for the US industry data to be a valid proxy for the "natural" exposure of an industry to a particular policy in a given country, it is not necessary that in each country the industry characteristics of interest takes on the same values as in the US. Indeed, it is sufficient that the ordering of the industries is about the same across countries.

However, even this milder requirement could be violated because each industry is the aggregate of various sub-industries and if there are important differences across countries in the mix of sub-industries, then using US industry data might entail measurement error and attenuation bias. Moreover, differences across countries in their education systems might lead to different incentives to invest in firm-specific human capital and therefore to important

cross-country heterogeneity in industry reallocation intensity. Similarly, differences across countries in comparative advantages might lead to heterogeneity in the set of growing and shrinking industries, thereby possibly creating heterogeneity across countries in the industry reallocation intensities (Zweimüller, 2009).

Furthermore, Ciccone and Papaioannou (2010) have argued that in some circumstances amplification bias might result, especially when the industry characteristics of interest in the benchmark country can be considered as a better proxy for the industry characteristics in more similar countries (e.g., in our paper in the case of countries with more lax employment protection legislation). For this reason they have proposed a "benchmarking bias approach" that, by applying a two-step IV estimation strategy, seeks to address possible biases associated to the use of US data as a proxy for the industry characteristics: we refer to Appendix B for an extensive discussion of the Ciccone and Papaioannou's (2010) methodology, and further below for an application of this estimator.

As a further robustness check, we also verify that our baseline results are robust to using the UK, rather than US, worker reallocation rate, and to another proxy of industry volatilty, namely a industry level measure of firm idiosyncratic risk in the US taken from Michelacci and Schivardi (2013).

Turning more generally to the Rajan and Zingales (1998) model, in equation (1) country fixed effects should control for any omitted variable at the country level that has the same effect on the entry or exit rate in all industries, such as the level of taxation, quality of institutions, macroeconomic conditions over the period, social norms, etc. In turn, industry dummies may capture differences in technologies, sector specific patterns of entry or exit and possible different stage of an industry's life cycles. Moreover, they may account for sector specific barriers to entry and exit, such as economies of scale, sunk costs, technological intensity, the degree of product differentiation and advertising intensity.

Our model specification takes also into account other possible determinants of entry and exit by including the relevant country and sector interactions Z_c and W_s, such as the country barriers to competition or the cost of insolvency interacted with the industry turnover rates,

or the industry dependence on external finance interacted with the country level of financial development. Controlling for the relevant country-industry interactions should allow us to take into account the possibility that some industry characteristics are correlated with the US reallocation intensity or that country characteristics are correlated with EPL: in this case, the omission of the relevant country-industry interactions would tend to bias the OLS estimate of our coefficient of interest.

Furthermore, in order to consider the possibility that the employment protection legislation impact might be related to some industry characteristics, in some specifications we augment our regressions with interactions between EPL and sector level variables, such as R&D and physical capital intensity in the US. Moreover, there might be country-level variables, potentially correlated with EPL, that tend to affect entry and exit rates particularly in industries that have higher labour flexibility requirements. Hence, in some regressions we also include additional interactions between $Reallocation_s$ and country level variables, such as various labour market institutions, barriers to competition, quality of institutions, levels of economic development, among others.

Our empirical model includes also a set of controls that vary at country and sector level ($X_{s,c}$) that have been found to affect reallocation rates (Bassanini and Garnero, 2013), such as the share of self-employed, the share of medium and low educated employees and the share of temporary contracts. Furthermore, in some specifications we further extend this set of controls by including possible determinants of firm dynamics discussed in the industrial organization literature such as a measure of vertical integration, growth opportunity and R&D intensity. Finally, since there could be concerns that countries that specialize in low turnover rate as well as low reallocation intensity industries might also be less likely to have stricter employment protection legislation, we estimate some IV regressions where we instrument EPL with variables related to the political history of each country (see the Empirical results section).

3 Data

3.1 Country-industry level

We use the last version of the SDBS Business Demography Indicators (ISIC Rev. 3) database from the OECD for our dependent variables. From this dataset, we extract information on entry and exit rates based on the number of active employer enterprises (see more below) for a set of 13 European countries (Austria, Belgium, Czech Republic, Denmark, Finland, Hungary, Italy, Netherlands, Norway, Portugal, Slovakia, Spain and Sweden) observed over the period 2004-2007. The dataset provides information on births (entry) and deaths (exit) for different sectors of economic activities at the ISIC Rev. 3 version of STAN, including manufacturing, electricity and gas, wholesale and retail trade, hotels and restaurants, transport, financial intermediation and real estate activities (more details in Tables 1 and 2).[7]

The total number of industries at the 2 digit ISIC Rev 3 level is 36; however, we exclude part of countries/sectors in the database when information was not available or missing for the observation period: we end up with 13 countries and 27 sectors. We refer to Appendix A.1 for details concerning the selection of the sample. In order to minimize missing data problems, we calculate the average of our dependent variables over the period 2004-2007. The complete dataset should include 351 observations (13 countries $\times$ 27 sectors $\times$ 1 year); however, our baseline regressions are run on 332 (293) observations for entry (exit) rates, with data for exit rates for Sweden that are completely missing. For some countries, the number of sectors is below 27, but it never falls below 24. With the relevant exception of the sector "Real estate activity", for which we have information available only for 8 countries, other sectors are equally represented across countries, ranging from 10 to 13 country observations (see Tables 1 and 2).

The main advantage of the SDBS dataset is that it allows us to compare cross-country data on entry and exit rates. As Bartelsman et al. (2005) discuss, this is the most relevant

[7]More information on the SDBS Business Demography dataset is available at the following webpage http://www.oecd.org/std/business-stats/eurostat-oecdmanualonbusinessdemographystatistics.htm. In particular, see Section 5 (7) of the manual for definitions of birth (death) events. It is important to remember that data are made available at industry level and we do not have direct access to firm level data.

problem when studying firm dynamics using aggregated sectoral data derived from business statistics and business registry. As pointed out in Eurostat (2007), to ease comparability across countries, the statistical unit to be used for firm demography data is the enterprise. In this paper, we use indicators based on the population of "employer enterprises", i.e., enterprises that have at least one employee.[8] For this population of employer enterprises, in Tables 1 and 2, we report the average stock and the standard deviation over the period 2004-07; moreover we report entry and exit rates as directly made available by the OECD.

Our regressions include a set of controls that are derived from different sources. In particular, after matching their (slightly) different sectoral classification, from Bassanini and Garnero (2013) we take the country-industry share of self-employed (Self-employed), the share of medium educated (Med. educated), the share of low educated (Low. educated) and the share of temporary contracts (Temporary).[9] We take the average values of these control variables over the period 2004-2007. Similarly, we also include in some of our robustness regressions a set of controls that vary at the country and sector level for the same period. In particular, we include a measure of vertical integration, calculated as the ratio between production and value added (Vertical Integration), the past five years industry value added growth (Past Industry Growth), as a proxy for growth opportunities, R&D expenditure over value added (R&D Intensity), the share of employment in each country-industry cell and an (inverse) proxy of barriers to entry, namely the ratio between the number of firms and total employment in a given country-industry cell. Finally, we include the number of hours worked per employee (Hours Employee). Such variables are obtained from the STAN Database for Structural Analysis (ISIC Rev 3 Classification), while R&D expenditures are derived from the ANBERD database and the employment share from the OECD SBSD database.

In Tables 1 and 2 we report descriptive statistics for the main variables at the sectoral

[8]Moreover, there is recognition that the population of employer enterprises is distinctly different from the population of non-employer businesses. Note that this is not the only possible unit of observations. For example, in a recent paper on the effect of taxation on firm dynamics, Kneller and Macgowan (2012) use the entire population of active enterprises derived from a previous version of the SBDS database, thus including self-employed.

[9]These are originally obtained from the Labour Force Surveys micro data and are made directly available on their webpage.

and country level respectively (more details on definitions and sources are discussed in next subsections). In Table 1, we observe a large degree of heterogeneity in terms of entry and exit rates across sectors. The average entry (exit) rate equals 9.83 (8.08) with a standard deviation of 3.19 (2.29), and a large variation in both entry and exit rates across sectors: by way of example, entry rates vary from 5.7 (Food, beverages and tobacco) to 15.39 (Other business activities). Note that non-manufacturing industries (codes 40 to 74) exhibit higher entry and exit rates with respect to manufacturing sectors (codes 15 to 37). Similarly, the US reallocation rate has a significant range of variation, i.e., between 15 and 85%.

In Tables A1 and A2 in Appendix A, we report the descriptive statistics for small (1 to 9 employees) and large (10 plus employees) at the sector and country level, respectively.[10] As expected, entry (exit) rates are higher for small firms with respect to large firms, with an average of 12.34 (10.18) against 2.13 (2.51). As a matter of fact, entry and exit are a small firm phenomenon: the average share of entry accounted for by large firms entrants across sectors is 4.5% (with a standard deviation of 3.2), ranging from 15% for utilities to 1% for activities related to financial intermediation. In turn, the average share of exit accounted for by large firms is about 5.6% (St. dev. 3.8).

Descriptive statistics reported in Table 2 illustrate a similar picture across countries. Entry rates vary between 4% (Belgium) to 13% (Hungary); similarly, exit rates for Belgium are very low (less than 3%), while they are very high for Portugal (about 13%). When disentangling country level entry and exit rates by firm size in Table A2 in Appendix A, we still detect important differences across countries. In this case, the share of entry accounted for by larger firms varies from about 1% in Portugal and Sweden to about 5% in Czech Republic and the Netherlands, while the average share of large firm exit is equal to 4.3% across countries.

[10]Originally, the dataset provides information on the following firm size categories: 1 to 4 employees, 5 to 9, 10 plus and 20 plus. However, the latter category is only available for the US, and we cannot disentangle the category "10 plus" in more detailed ways. We decided to jointly consider the first two categories of firm size.

Table 1: Descriptive statistics. Industry level

Industry: Code and Description	Obs.	Entry	Obs.	Exit	N. Firms (s.d.)	Reallocation
15_16 Food Products, Beverages And Tobacco	13	5.7	12	6.45	8480 (12709)	39.22
17_18 Textiles And Textile Products	12	7.23	11	10.08	6898 (10811)	41.87
21_22 Pulp, Paper, Paper Products, Printing And Publishing	13	7.06	12	7.41	5160 (5425)	34.37
27_28 Basic Metals And Fabricated Metal Products	13	7.18	12	6.19	12512 (18055)	32.43
30_33 Electrical And Optical Equipment	13	6.41	12	6.67	4514 (5892)	31.61
34_35 Transport Equipment	12	6.63	11	5.6	1333 (1517)	27.64
36_37 Manufacturing N.E.C. And Recycling	13	6.8	12	7.36	5623 (7356)	45.21
40 Electricity, Gas, Steam And Hot Water Supply	10	9.04	5	4.22	554 (294)	15.51
41 Collection, Purification And Distribution Of Water	10	5.53	5	3.11	244 (271)	15.51
45 Construction	13	11.44	12	9.24	67935 (92629)	57.3
50 Sale Of Automotive Fuel	12	7.36	11	6.44	18411 (21260)	57.89
51 Wholesale, Trade And Commission Excl. Motor Vehicles	12	9.1	11	7.93	39372 (38011)	38.04
52 Retail Trade Excl. Motor Vehicles - Repair Of Household Goods	13	9.55	12	9.11	71921 (83388)	62.64
55 Hotels And Restaurants	13	11.66	12	10.66	46570 (58596)	85.87
60 Land Transport - Transport Via Pipelines	13	9.43	12	8.5	18194 (22445)	41.17
61 Water Transport	13	10.3	11	9.75	453 (546)	41.17
62 Air Transport	13	9.56	11	8.18	90 (58)	41.17
63 Supporting And Auxiliary Transport Activities	13	9.6	12	7.22	4653 (5347)	41.17
64 Post And Telecommunications	12	16.5	11	12.83	1170 (1323)	30.09
65 Financial Intermediation, except insurance and pension funding	13	10.64	12	6.47	1339 (1387)	39.35
66 Insurance And Pension Funding, except compulsory social security	13	5.97	12	4.67	202 (182)	39.35
67 Activities Related To Financial Intermediation	13	12.76	12	9.91	6677 (8033)	39.35
70 Real Estate Activities	8	13.79	7	9.36	19901 (29069)	45.91
71 Renting Of Machinery And Equipment	13	12.11	12	9.91	2590 (3299)	43.14
72 Computer And Related Activities	13	13.37	12	9.57	8628 (7888)	43.14
73 Research And Development	13	15.27	12	11.08	685 (566)	43.14
74 Other Business Activities	10	15.39	7	10.32	75587 (61579)	43.14

Notes: Descriptive statistics have been calculated on the sample used in baseline regressions (Table 3 col. 1). Industries codes follow the ISIC Rev 3 Classification (see http://www.oecd.org/sti/ind/40729523.pdf) Definitions: Entry is the average entry rate of employer enterprises, Exit is the average exit rate of employer enterprises. More information on the dataset is available at this link: http://www.oecd.org/std/business-stats/eurostat-oecdmanualonbusinessdemographystatistics.htm, see Section 5 (7) of the manual for definitions of birth (death) events. N. Firms is the average of number of employer enterprises in each sector over the sample period with its standard deviation. Reallocation is directly taken from Bassanini and Garnero (2013), and it is the average level of US sectoral worker reallocation over the period 2004-2007. See Section 3 for more details.

Table 2: Descriptive statistics. Country level

Country	Obs.	Entry rate	Obs.	Exit rate	N. Firms (s.d.)	EPL	Law Enfor.	EPL Adj.
Austria	27	8.11	27	7.64	6677 (10052)	2.62	5.73	2.40
Belgium	24	3.98	22	2.69	6454 (9290)	2.76	5.18	2.28
Czech Republic	26	8.92	24	8.1	7894 (11119)	2.92	4.14	1.93
Denmark	26	10.21	26	10.89	3114 (4440)	2.45	6.27	2.45
Finland	27	9.95	24	8.57	3720 (5115)	2.08	6.19	2.06
Hungary	22	13.12	20	11.4	11093 (18340)	2.40	4.40	1.68
Italy	27	10.49	27	7.78	47121 (66761)	3.15	3.56	1.79
Netherlands	27	11.55	25	8.51	12139 (16902)	2.92	5.96	2.77
Norway	24	6.75	24	4.43	3221 (4812)	2.38	6.03	2.29
Portugal	24	13.1	24	13.94	31796 (50124)	3.98	5.40	3.42
Slovakia	24	10.77	23	7.13	5998 (8548)	2.66	4.01	1.70
Spain	27	10.2	27	7.54	54257 (82133)	2.76	4.27	1.88
Sweden	27	9.99	0	n.a.	8023 (11423)	2.58	5.76	2.37

Notes: Descriptive statistics have been calculated on the sample used in baseline regressions (Table 3 col. 1). Average values for entry and exit rates over period 2004-2007 are reported. N. Firms is the average of number of employer enterprises in each country over the sample period with its standard deviation. EPL is the OECD indicator calculated as the weighted sum of sub-indicators concerning the regulations for individual and collective dismissals averaged over the period 2004-07, Law Enforcement Index is the "Contracts and law" sub-index, taken from the World Economic Forum (2006) and further described in Appendix A.3, EPL Adj is obtained by multiplication of EPL and Law Enforcement (after adjustment). See Section 3 and Appendix A.3 for more details.

3.2 Industry level

Our measure of labour reallocation is directly taken from Bassanini and Garnero (2013), and it is the average level of sectoral worker reallocation over the period 2004-2007. This measure has been calculated by the authors as the sum of hiring and separations over employment using the Displaced workers/Job tenure supplement of the US Current Population Surveys. Similar measures of job or worker reallocation have been used by Haltiwanger et al. (2014) and Bassanini et al. (2009).

Other industry level control variables are obtained from different sources and, otherwise stated, refer to the US. In particular, we consider, the turnover rate in the US calculated as the sum of entry and exit rates from the SDBS dataset (Turnover), a measure of financial dependency from Bravo-Briosca et al. (2013) (Financial Dependence), and a measure of capital intensity from the same source (Capital Intensity). Moreover, in regressions not reported, but available upon request, we further control for: a measure of R&D intensity in the US over value added from the same source, the average growth rate of full-time equivalents in the US for the period 1993-2003 from the STAN database and an index of industry level of volatility, as a proxy of sectoral riskiness. The latter is obtained, by

Michelacci and Schivardi (2013), separately for each sector, applying the methodology by Campbell et al. (2001). The above variables have been interacted with country level variables described in the next subsection.

3.3 Country level

Our preferred measure for employment protection legislation is, following Bassanini et al. (2009) and Bassanini and Garnero (2013), version 2 of the indicator directly available from the OECD, calculated as the weighted sum of sub-indicators concerning the regulations for individual dismissals (weight of 5/7) and additional provisions for collective dismissals (2/7) in the case of regular workers. The overall index, calculated as the average for our sample period 2004-07, varies from 0 (least restrictive) to 6 (most restrictive) and incorporates 12 detailed data items for individual and collective dismissals.[11] In the robustness checks (see Table 6) we combine them to obtain different sub-indicators for EPL proposed by the OECD in order to analyse specific features of a country's employment protection legislation. In our data there is a negative but small correlation (-0.34) between the stringency of regulation of individual and collective dismissals for regular workers, which suggests that collective dismissals tend to be stricter in countries with more lax individual dismissal regulations.

In one regression specification we control also for the OECD index of employment protection for temporary workers, that appears to be only weakly positively correlated (0.24) with the overall OECD index of employment protection for regular workers.[12]

In the preferred empirical specification we follow Haltiwanger et al. (2014) by taking

[11] In particular, the 8 items for individual dismissals are: Notification procedures, Delay involved before notice can start, Length of the notice period at different years of tenure, Severance pay at different years of tenure, Definition of justified or unfair dismissal, Length of trial period, Compensation following unfair dismissal, Possibility of reinstatement following unfair dismissal. The 4 items for collective dismissals are: Definition of collective dismissal, Additional notification requirements in case of collective dismissals, Additional delays involved in case of collective dismissals, Other special costs to employers in case of collective dismissals. For more details see http://www.oecd.org/employment/emp/oecdindicatorsofemploymentprotection.htm.

[12] The index for temporary workers is a weighted average of provisions related to restrictions in the use of fixed-term contracts or temporary work agency employment. In particular, the items are: Valid cases for use of fixed-term contracts, Maximum number of successive fixed-term contracts, Maximum cumulated duration of successive fixed-term contracts, Types of work for which temporary work agency (TWA) employment is legal, Restrictions on the number of renewals of TWA assignments, Maximum cumulated duration of TWA assignments.

into account the possibility that formal EPL provisions might not be a perfect proxy for their actual enforcement. We therefore correct the OECD EPL indicator using information on indexes that aim to capture the efficiency and reliability of legal systems: indeed, we believe that, in countries with more efficient and transparent legal systems, the degree of enforcement of laws tends to be higher (see Table 2). In Appendix A.3 we provide accurate description of the indexes on law enforcement and possible alternatives used in the literature. Throughout the paper, unless otherwise stated, we label as EPL our adjusted indicator.

In our robustness regressions we use the following controls at the country level: an OECD index of barriers to entrepreneurship, measured as the average of the indexes for regulatory and administrative opacity, burdens on start-ups and barriers to competition (Barriers); a measure of financial development taken from the World Bank (Financial Development); a measure of costs for resolving insolvency from the World Bank (Insolvency). Moreover we consider a set of controls for other labour market institutions from Bassanini and Garnero (2013): union density (Union Density), a measure of corporatism (Corporatism), the tax wedge (Tax Wedge), and the gross replacement rate for unemployment benefits (Replacement Ratio UB). In one regression specification, we check whether the effect of EPL varies with the distance from the technological frontier: the TFP level of each country (TFP Distance), measured as a percentage of the US, comes from the last release of the Penn World Tables.

4 Empirical results

4.1 Baseline results

In Table 3 we report empirical estimates of the baseline specification of equation (1) for both entry and exit rates with different estimation techniques. Unless otherwise specified, all regressions include the interaction between the US worker reallocation rate at industry level and country level EPL, country and sector fixed effects, as well as a set of controls that vary at both country and sector level, namely the share of temporary workers, the percentage of self-employed and workers educational attainment (the share of medium and low skilled, with

high skilled being the omitted category). Moreover, unless otherwise stated, since sectoral data might suffer from measurement error which is likely to be negatively correlated with the dimension of the sector (Stiroh, 2002; Michaels et al., 2014), we use employment in each country-industry cell as analytical weights in most regressions, as in Haltiwanger et al. (2014).[13]

In column 1 we estimate the baseline difference-in-difference specification in equation (1) with OLS. As results displayed in Table 3 show, the interaction between US reallocation and EPL is negative and statistically significant at the 1% confidence levels in both cases. In the entry regression (top panel), the coefficient of -0.085 implies that the difference in entry rates in an industry with high flexibility requirements (i.e., at the 90th percentile of US worker reallocation intensity, with a value of 57.9) and an industry with low flexibility requirements (i.e., at the 10th percentile of the US worker reallocation rate, with a value of 30) is reduced by about 2.5 percentage points in a country at the 90th percentile of EPL (The Netherlands, with a value of 2.77) compared to a country at the 10th percentile (Slovakia, with a value of 1.70).[14]

In order to understand the magnitude of these effects, we can observe that the sample cross-country mean difference in entry rates between the industries at the 90th and 10th percentile of worker flexibility requirements is about 9 percentage points. Therefore, a differential of about 2.5 percentage points is equivalent to about 22% of the cross country mean difference, which is a non-negligible effect.

In the case of the exit rate (bottom panel of the Table), the differential between the industry with high and low flexibility requirements is reduced by about 1.7 percentage points in a country with high with respect to a country with low values of EPL, which is a slightly

[13]We use standard errors robust to heteroscedasticity. We also checked that results are robust to using standard errors robust to clustering along both the country and industry dimensions: results are available from the authors upon request. We have also estimated the baseline regression with a robust regression technique that drops outliers and weights each observations according to absolute residuals and then re-estimates the regression in an iterative process. Estimation results are very similar to those reported in Table 3 and are available from the authors upon request.

[14]In order to ease the interpretation of this result, we can express the differential in entry rates as follows: $D = \alpha * (Reallocation\_90 - Reallocation\_10) * (EPL\_90 - EPL\_10)$, where α is the coefficient of the interaction between Reallocation and EPL.

Table 3: Baseline regressions

Dependent Variable:	Entry Rate						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Estimation Method	OLS	OLS	OLS	GLM	IV	OLS (UK Reall.)	Benchmarking Bias
Weights	Yes	No	Yes	Yes	Yes	Yes	Yes
Reallocation × EPL	-0.0856***	-0.0487**	-0.0858***	-0.00813***	-0.147***	-0.0598*	-0.348***
	(0.0308)	(0.0245)	(0.0302)	(0.00276)	(0.0453)	(0.0357)	(0.0987)
Controls	yes	yes	no	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes
Observations	327	332	327	327	327	327	327
R-squared	0.696	0.604	0.677		0.682	0.683	
Dependent Variable:	Exit Rate						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Estimation Method	OLS	OLS	OLS	GLM	IV	OLS (UK Reall.)	Benchmarking Bias
Weights	Yes	No	Yes	Yes	Yes	Yes	Yes
Reallocation × EPL	-0.0580***	-0.0575***	-0.0556***	-0.00641***	-0.0825***	-0.0395*	-0.176***
	(0.0193)	(0.0186)	(0.0194)	(0.00181)	(0.0283)	(0.0215)	(0.0366)
Controls	yes	yes	no	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes
Observations	290	293	290	290	290	290	290
R-squared	0.802	0.732	0.792		0.797	0.790	

Notes: Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Dependent variable in top (bottom) panel is the average Entry (Exit) rate of employer enterprises over the period 2004-2007. Analytical weights are the number to employees at the country-industry level. Reallocation is sectoral US worker reallocation and it is taken from Bassanini and Garnero (2013). EPL is the OECD indicator for Employment Protection Legislation averaged over the period 2004-07; it is calculated as the weighted sum of sub-indicators concerning the regulations for individual dismissals and additional provisions for collective dismissals and adjusted according to the Law Enforcement Index reported in Table 2. See also Appendix A.3 for more details. Controls are the country-industry share of self-employed (Self-employed), the share of medium educated (Med. Educated), the share of low educated (Low Educated) and the share of temporary contracts (Temporary) from Bassanini and Garnero (2013) and are calculated as average values over the period 2004-2007. Country and industry dummies are included. In cols. 1 to 3 estimation method is OLS. In col. 4 estimation model is GLM. In col. 5 instruments are dummies "Socialist" and "Facilitator" interacted with Reallocation and discussed in Subsection 4.1. In col. 6 the UK reallocation rate is taken from Bassanini and Garnero (2013). In col. 7, the estimation method is the two-step IV estimator proposed by Ciccone and Papaioannou (2010) and discussed in detail in Appendix B.

stronger effect, if we consider that the cross-country mean difference in exit rates between the industries at the 90th and 10th percentile of US reallocation intensity is just about 6 percentage points.

In the next columns, we probe the robustness of these results along different dimensions. First, in column 2 we report unweighted OLS regressions. Parameter estimates are barely altered in the exit regression; in turn, weighting seems to be more important in the case of entry, as the coefficient of EPL drops by about 40% in the unweighted regression, although it remains statistically significant at the 5% level. In column 3 we drop the set of controls that vary at country-industry level (Temporary, Self-employed, Med. Educated, Low Educated): indeed, if they were endogenous, a bad control problem might arise, possibly leading to biased estimates also in the case of our variable of interest. Reassuringly, the magnitude as well as the statistical significance of EPL appear to be remarkably stable.

In column 5 we take into account the possibility that EPL is endogenous. Indeed, it might happen that EPL and entry (exit) rates are jointly determined if a country that specializes in low turnover and reallocation intensity industries is less likely to adopt strict employment protection legislation rules. In order to address the possible endogeneity of EPL, we use two instruments. The first is a dummy variable equal to 1 for former socialist countries: the idea is that in socialist countries firms were under a socialist government ownership and therefore there was no ideological need to protect workers from being fired. Therefore, we expect that this legacy of the socialist regime led to lower EPL in former socialist countries. The second instrument is based on a categorization –due to Crouch (1993) and exploited in Mueller and Philippon (2011)– of attitudes taken by European governments at the end of the 19th century-beginning of the 20th century against the rising labour unions. While some countries took an opposing stance against trade unions, others tried to co-opt them into the system, while others took a neutral position. It might be the case that in "facilitator" countries governments passed more friendly labour legislation laws whose "imprinting" somewhat survived 100 years later.

In this study we build a dummy variable equal to 1 for countries that Crouch (1993)

included into the "facilitator" category, namely those within the former Habsburg Empire (Austria, Slovakia, Hungary and Czech Republic) plus The Netherlands, and zero otherwise. We then interact industry worker reallocation in the US with the dummies "Socialist" and "Facilitator" and use these two interacted variables as our instruments.[15] As far as the magnitude of the effect of EPL is concerned, we note that the coefficient of the interaction terms increases (in absolute value) to -0.147 in the entry regression and to -0.082 in the exit regression, respectively. These coefficients suggest that the differential in entry (exit) rates of the industry with high and low flexibility requirements is reduced by about 4.3 (2.5) percentage points in a country with high with respect to a country with low values of employment protection legislation, which is a somewhat larger effect than that found in the case of the OLS regressions. However, it is important to note that we cannot reject the null hypothesis that the interaction term between worker reallocation and EPL is actually exogenous. Moreover, the OLS and IV 90% confidence intervals largely overlap so that we cannot rule out that the IV estimates are indeed not that different from the OLS ones.

One of the most serious problems in the cross-country-industry studies in the tradition of Rajan and Zingales (1998) is that the use of US reallocation intensity might be a poor proxy of "natural" reallocation intensity, due to idiosyncratic characteristics in the US industry structure. We tackle this issue in two ways. First, we consider the UK industry worker reallocation intensity: indeed, the UK has the most flexible labour market in Europe and for this reason it has already been used in the past (Bassanini and Garnero, 2013) as a possible robustness check to the use of US industry data. Parameter estimates reported in column 6 show a drop in the magnitude of the coefficient of interest as well as in its statistical precision; nevertheless, also in this case the interaction between Reallocation and EPL is negative and statistically significant at the 10% level of confidence.

As a second robustness check, we apply the two-step IV approach proposed by Ciccone

[15]First stage results, available from the authors upon request, show that in both regressions excluded instruments are statistically significant and with the expected sign. Moreover, the Hansen J test statistics rejects at least at the 5% level of confidence the null hypothesis that the excluded instruments are correlated with the error term, while the Kleibergen-Paap rk Wald F statistics does not seem to indicate major signs of a weak instrument problem.

and Papaioannou (2010), discussed in Appendix B and recently applied in the employment protection legislation literature by Haltiwanger et al. (2014) and Bassanini and Garnero (2013). Regression results reported in column 7 show a very large increase in parameter estimates, namely a four-fold and threefold increase in the case of the entry and exit regressions, respectively. As noted in Appendix B, the increase in the coefficient magnitude can be explained recalling that OLS estimates tend to be characterized by attenuation bias when measurement error is a more important issue relatively to amplification bias, which in turn arises when the US industry characteristics (US industry worker reallocation, in our case) is a better proxy in the case of countries with a country-level characteristics (EPL, in our case) similar to the US. In other words, the higher magnitude associated to the two-step IV approach might be due to the fact that the US industry worker reallocation intensity is not a better proxy of "natural" industry reallocation intensity in countries with lower levels of EPL, on one side; and that US industry reallocation is a noisy measure of "natural" reallocation intensity, on the other side. Nevertheless, while a twofold increase associated to the use of the two-step IV approach of Ciccone and Papaioannou (2010) is not uncommon in the literature (see Bassanini and Garnereo, 2013), a four-fold one is definitely a very large one. For this reason, following the previous literature, we prefer to focus on the most conservative OLS estimates in the remainder of the paper.

The theoretical literature that we have briefly surveyed in the Introduction finds that the impact of EPL on various firm level outcomes, such as entry, exit and productivity, tends to be stronger in the case of firms facing idiosyncratic shocks to productivity or demand characterized by a higher variance. In turn, the volatility of shocks has been often operationalized in the empirical literature by various industry characteristics associated to employment dynamics, such as job flows, layoff, job turnover or worker reallocation intensity. While these industry characteristics are clearly associated to sector level volatility of productivity or demand shocks, it might be interesting to explore whether our results are robust to using a variable that seeks to directly measure the variance of idiosyncratic firm level shocks. In regressions not reported, but available upon request, we do this using a measure of industry-

level idiosyncratic risk in the US computed by Michelacci and Schivardi (2013) who adopted a methodology first proposed in Campbell et al. (2001). Empirical results show that EPL is negatively correlated to both entry and exit rates in industries characterised by higher levels of idiosyncratic business risk. Moreover, the magnitude is only slightly lower to that identified when using US worker reallocation intensity as the "exposure" variable: indeed, the entry (exit) rate differential between the industries with high and low idiosyncratic risk would be reduced by about 2.5 (1.5) percentage points in a country with high with respect to a country with low levels of EPL.

So far, we have assumed a linear relationship between entry (exit) rates and the independent variables; however, the linearity assumption can be problematic when the dependent variable is fractional, i.e. when it takes on values between zero and one.[16] In this case, following Papke and Wooldridge (1996), we assume that the conditional mean of the entry (exit) rate is a logit function of the independent variables and we estimate a Generalized Linear Model (GLM) by quasi-maximum likelihood, where the quasi-likelihood function is the binary choice log-likelihood.[17] Regression results reported in column 4 suggest that dealing with the fractional response nature of the dependent variable does not seem to matter: indeed the interaction of reallocation with EPL is negative and statistically significant. Moreover, once we compute the marginal effects of the interaction term, we find values of -0.075 (-0.049) in the case of the entry (exit) rate regressions, very similar to the OLS coefficients reported in column 1.

One might argue that, by adjusting the OECD EPL index with a rule of law indicator, one might be picking up possible effects of the efficiency of the law system on entry and exit that do not occur by influencing the enforcement of employment protection provisions. For this reason, we additionally include in a regression (not reported but available from the authors upon request) a separate interaction of the efficiency of law indicator (WCR), discussed

[16]The linearity assumption can be problematic in our case because of the large differences between entry and exit across industries and countries. See Bassanini and Garnero (2013) for a similar observation in the case of worker reallocation rates.

[17]See Bassanini and Garnero (2013) and Bassanini and Brunello (2011) for recent empirical applications and Wooldridge (2010) for a theoretical discussion.

above and in Appendix A.3, with US worker reallocation: interestingly, this interaction is not statistically significant, while the interaction between US worker reallocation and EPL is virtually unaltered. This confirms that it is EPL and not the efficiency of the legal system per se that influences entry and exit rates in reallocation intensive industries; moreover, the result also suggests that, in industries with strong reallocation needs, efficiency and competitiveness of the law system influences firm turnover rates only by modifying the degree of enforcement of employment protection legislation provisions.

In Table C1 in Appendix C we conduct other robustness checks on the baseline specification reported in column 1 of Table 3. First, we show that our results are almost identical if we alternatively adjust the OECD EPL index with the EFW law and order indicator also employed by Haltiwanger et al. (2014).[18] Second, we test whether results are sensitive to the exclusion of a single industry or country. We refer to the Appendix C for comments on further robustness checks.

Overall, these results suggest that countries with stricter employment protection regulations tend to have lower firms' entry and exit rates in industries that naturally require more workers' flexibility. While the results for the entry rate are broadly in line with the previous empirical literature, the negative impact of EPL on exit rates is, to the best of our knowledge, a novel one.

4.2 Robustness checks

In this Section, we discuss a series of robustness checks whose results are shown in Tables 4 and 5. First, in columns 1 of both Tables we report estimates of an augmented model where we include a set of variables, that vary both at country and sector level, that need to be taken into account when analysing entry and exit dynamics. We find that industry growth opportunities (Past Industry Growth) is positively associated to firm turnover, while R&D Intensity is negatively correlated to entry: indeed a higher level of R&D may act as a barrier to entry to protect incumbents from potential entrants. However, the impact of these

[18] Similar results are obtained if we adjust the OECD EPL indicator with the RL variable of the World Bank. See Appendix A.3 for additional details.

control variables is estimated with noise. Reassuringly, our coefficient of interest confirms the previous finding of a negative impact of EPL on firm dynamics in high reallocation industries.[19] Moreover, it is important to note that the inclusion of this set of controls entails a severe loss of observations; moreover, most of them are endogenously determined and might generate biases in parameter estimates. For these reasons, we decide to exclude this set of controls from the empirical models presented in the remaining columns of the Tables.

In columns 2 of Tables 4 and 5 we consider the role of specific regulatory barriers to entry and exit. Indeed, country-specific barriers to entry and exit might be important omitted drivers of entry and exit rates. Moreover, if the political process leading to higher barriers to entry and exit also leads to stricter EPL, it might turn out to be extremely important to control for barriers to entry and exit in the product market. In particular, we consider in the entry regression the interaction between the OECD indicator of barriers to entrepreneurship (defined as the average of the OECD indexes of barriers to competition, burden on start-ups and regulatory and administrative opacity) and the US industry level of firms' turnover rates. Indeed, one could argue that barriers to entry in the product market are more likely to display stronger effects in sectors that are naturally characterized by higher levels of firm turnover (Andrews and Cingano, 2014), and that the US is in general the country with the most liberalized product market. Similarly, in the case of the exit rate regression, we consider the interaction of turnover rates in the US with a country level index of the cost of insolvency, as a measure of barriers to exit. Empirical results show that the interaction between industry turnover rates in the US and barriers to entrepreneurship is negative and statistically significant, confirming previous results in the literature (Klapper et al., 2006) and suggesting that a relaxation of barriers to entry might indeed increase entry rates. In turn, in the exit regressions, the interaction of firm turnover in the US with the cost of

[19] As we noted in Section 4.1, industry specific determinants of entry and exit that do not significantly vary across countries are already controlled by sector dummies. Furthermore, our results are confirmed when we add the share of employment in each country-industry cell in 2004 in order to take into account the possibility that the size of the sector plays a role in shaping entry and exit rates; or if we include a proxy for minimum efficient scale as a possible barrier to entry, proxied by the inverse of average firm size in each country-industry cell, as in Bravo-Biosca et al. (2013).

insolvency index displays a negative coefficient as one would expect, although the estimates are rather imprecise.[20] Reassuringly, the interaction of Reallocation with EPL is negative and statistically significant.

In columns 3 of the two Tables we follow Aghion et al. (2007) by including the interaction between the US industry level of financial dependency with the country level of financial development, proxied by the ratio of private credit by domestic money banks and GDP. In the case of entry, we find that a higher level of financial development has a positive impact (although marginally not statistically significant) on entry rates in sectors that require more external finance, broadly confirming the results of Aghion et al. (2007), while we do not find any effect in the case of the exit rates. Reassuringly, the impact of EPL is unchanged.

In the next columns, we explore the possibility that EPL is simply picking up the effect of other country level variables, potentially correlated with EPL, that could affect entry and exit rates in sectors that naturally require more flexibility. In columns 4 we jointly consider the interaction of reallocation intensity with various labour market variables that have been previously considered as possible confounding factors for EPL (Bassanini and Garnero, 2013), namely union power (measured by union density), the degree of corporatism in the economy, the tax wedge and the gross replacement rate of unemployment benefits. In the case of the entry regressions, we find that the effect of EPL is only slightly larger than in the baseline model and that, among the other variables, the degree of corporatism seems to be weakly negatively associated to entry rates, while union density and the gross replacement rate appear to be positively correlated. Similarly, in the exit regression we find that the degrees of corporatism is negatively associated to exit rates, while the interaction of EPL and Reallocation is confirmed to be negative, statistically significant and with a magnitude slightly larger than in the baseline specification reported in Table 3.[21]

[20] We have also tried with other proxies of the cost of insolvency available in the literature (taken from the EDB database of the World Bank) such as the recovery rates in bankruptcy procedures or the time to complete a bankruptcy procedure, but none of them was statistically significant. Interestingly, the interaction between US firm turnover and the cost of insolvency is no longer a significant driver of reallocation in Andrews and Cingano (2014) when they contemporaneously control for barriers to entry and employment protection.

[21] It is important to recall that the various labour market institutions considered in columns 4 are highly correlated in the case of OECD countries, and therefore we cannot rule out the possibility that results in columns 4 emerge because of multicollinearity. Indeed, in unreported regressions and following Bassanini

Table 4: Robustness analysis for entry rate

Dependent Variable: Entry Rate	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Reallocation × EPL	-0.0587*	-0.0876***	-0.0804***	-0.106***	-0.0875***	-0.0731	-0.0874***	-0.0800***	0.194	-0.233***
	(0.0303)	(0.0304)	(0.0297)	(0.0300)	(0.0306)	(0.0496)	(0.0312)	(0.0299)	(0.158)	(0.0378)
Past Industry Growth	0.0166									
	(0.0573)									
R&D Intensity	-0.0164									
	(0.0580)									
Vertical Integration	0.00442									
	(0.0595)									
Turnover × Barriers		-0.369**								
		(0.159)								
Financial Dependence × Financial Development			0.0672							
			(0.0408)							
Reallocation × Tax Wedge				-0.00408						
				(0.00256)						
Reallocation × Corporatism				-0.0347*						
				(0.0194)						
Reallocation × Union Density				0.000920*						
				(0.000534)						
Reallocation × Replacement Ratio UB				0.00400***						
				(0.00146)						
Reallocation × Barriers					-0.0621					
					(0.0453)					
Turnover × EPL						-0.0847				
						(0.196)				
Capital Intensity × EPL							-0.502**			
							(0.228)			
Financial Dependence × EPL								2.424		
								(4.121)		
Reallocation × EPL × TFP Distance									-0.349*	
									(0.204)	
Reallocation × TFP Distance									0.776*	
									(0.463)	
Reallocation × EPL × Hours Employee										5.22e-05**
										(2.10e-05)
Hours Employee										-0.0126***
										(0.00319)
Weights	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	272	327	327	302	327	327	314	327	327	221
R-squared	0.724	0.700	0.714	0.747	0.698	0.697	0.699	0.701	0.700	0.798

Notes: Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Reallocation is sectoral US worker reallocation; EPL is calculated as the weighted sum of sub-indicators concerning the regulations for individual dismissals and additional provisions for collective dismissals averaged over the period 2004-07 and adjusted according to the Law Enforcement Index in Table 2. Analytical weights are the number to employees at the country-industry level. Controls are the country-industry share of self-employed (Self-employed), share of medium educated (Med. educated), share of low educated (Low. educated) and the share of temporary contracts (Temporary). In column 1, controls that vary at country and sector level are: a measure of vertical integration (Vertical Integration), the past five years industry value added growth (Past Industry Growth) and R&D expenditure over value added (R&D Intensity). Other controls: the turnover rate in the US calculated as the sum of entry and exit rates (Turnover), a measure of financial development (Financial Dependence), and a measure of capital intensity (Capital Intensity). These variables have been interacted with country level variables: average of the indexes for regulatory and administrative opacity, burdens on start-ups and barriers to competition (Barriers); a measure of financial development (Financial Development); a set of controls for other labour market institutions: union density (Union Density), a measure of corporatism (Corporatism), the tax wedge (Tax Wedge), and the gross replacement rate for unemployment benefits (Replacement Ratio UB). The TFP level of each country (TFP Distance) is measured as a percentage of the US in col.9. In column 10 we include the country/sector number of hours per employee (Hours Employees) and the triple interaction term.

Table 5: Robustness analysis for exit rate

Dependent Variable: Exit Rate	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Reallocation × EPL	-0.0440**	-0.0596***	-0.0573***	-0.0669***	-0.0771***	-0.0607**	-0.0577***	-0.0563***	-0.180*	-0.123***
	(0.0192)	(0.0209)	(0.0192)	(0.0214)	(0.0206)	(0.0293)	(0.0194)	(0.0193)	(0.105)	(0.0317)
Past Industry Growth	0.0139									
	(0.0361)									
R&D Intensity	0.0236									
	(0.0294)									
Vertical Integration	0.0250									
	(0.0266)									
Turnover × Insolvency		-0.00129								
		(0.00631)								
Financial Dependence × Financial Development			0.00817							
			(0.0213)							
Reallocation × Tax Wedge				-3.99e-05						
				(0.00195)						
Reallocation × Corporatism				-0.0472**						
				(0.0238)						
Reallocation × Union Density				0.000816						
				(0.000718)						
Reallocation × Replacement Ratio UB				0.00125						
				(0.00122)						
Reallocation × Insolvency					-0.00216					
					(0.00175)					
Turnover × EPL						0.0179				
						(0.121)				
Capital Intensity × EPL							0.0424			
							(0.111)			
Financial Dependence × EPL								0.724		
								(1.794)		
Reallocation × EPL × TFP Distance									0.154	
									(0.133)	
Reallocation × TFP Distance									-0.444	
									(0.314)	
Reallocation × EPL × Hours Employee										1.55e-05
										(2.48e-05)
Hours Employee										-0.00591
										(0.00396)
Weights	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	241	290	290	265	290	290	278	290	290	192
R-squared	0.820	0.803	0.803	0.829	0.805	0.803	0.805	0.803	0.808	0.815

Notes: Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Reallocation is sectoral US worker reallocation; EPL is calculated as the weighted sum of sub-indicators concerning the regulations for individual dismissals and additional provisions for collective dismissals averaged over the period 2004-07 and adjusted according to the Law Enforcement Index in Table 2. Analytical weights are the number to employees at the country-industry level. Controls are the country-industry share of self-employed (Self-employed), share of medium educated (Med. educated), share of low educated (Low. educated) and the share of temporary contracts (Temporary). In column 1, controls that vary at country and sector level are: a measure of vertical integration (Vertical Integration), the past five years industry value added growth (Past Industry Growth) and R&D expenditure over value added (R&D Intensity). Other controls: the turnover rate in the US calculated as the sum of entry and exit rates (Turnover), a measure of financial development (Financial Dependence), and a measure of capital intensity (Capital Intensity). These variables have been interacted with country level variables: a measure of financial development (Financial Development); a measure of costs for resolving insolvency (Insolvency); a set of controls for other labour market institutions: union density (Union Density), a measure of corporatism (Corporatism), the tax wedge (Tax Wedge), and the gross replacement rate for unemployment benefits (Replacement Ratio UB). The TFP level of each country (TFP Distance) is measured as a percentage of the US in col.9. In column 10 we include the country/sector number of hours per employee (Hours Employee) and the triple interaction term.

In columns 5 we include an interaction term between reallocation intensity and the OECD indicator of barriers to entrepreneurship and the costs of insolvency in the entry and exit regressions, respectively. The rationale for this control is to explore the possibility that country-specific barriers (which are often correlated with EPL) influence entry and exit especially in high worker reallocation industries. Reassuringly, the interaction between EPL and industry reallocation in the US is always negative and statistically significant.[22]

We further examine whether EPL continues to display a negative and statistically significant effect when we interact it with other industry characteristics that can be thought to influence entry and exit rates, such as firm turnover intensity (column 6), physical capital intensity (column 7) and financial dependency (column 8).[23] In column 6 we find that the coefficients of the interaction term between Reallocation and EPL is very stable, although in the entry regression it is only slightly imprecisely estimated, probably for the positive correlation between industry firm turnover intensity and industry worker reallocation intensity that exists in our data.[24] In column 7 of Table 4 we can note that EPL tends to be significantly negatively correlated to entry in physical capital intensive industries, probably because firms might fear the occurrence of an hold-up problem and therefore enter less.[25] In turn, in column 8 of Table 5 we do not find any evidence for EPL to have a negative effect on entry and exit rates in industries that rely more on external finance. Reassuringly, we find that the negative effect of the interaction of worker reallocation and EPL is robust, with

et al. (2009), we have added to our baseline specification one additional labour market institution at a time: while the magnitude and statistical significance of EPL is barely affected, the other labour market institutions are never statistically significant, the only exception being the degree of corporatism in the exit regression.

[22]In unreported regressions, but available from the authors upon requests, we have controlled for interactions between worker reallocation and country per capita GDP, the ICGR index of the quality of institutions and the degree of openness to trade. Our main results are confirmed.

[23]Indeed, higher levels of physical capital intensity might create barriers to entry and exit in the presence of imperfect capital markets. Firms in industries that tend to rely more on externally provided finance might face higher barriers to entry, while firm turnover is highly correlated with worker reallocation and it is therefore worth exploring whether EPL interacts also with industry firm turnover.

[24]In unreported regressions, but available from the authors upon request, we drop the reallocation-EPL interaction and we find that the interaction of US firm turnover rates and EPL is negative and statistically significant in both regressions. Probably this is because firm turnover rate acts as a proxy of reallocation rate: indeed, an important fraction of job flows takes place through the extensive margins, i.e. through entry and exit of firms, as noted by Haltiwanger et al. (2014).

[25]Cardullo et al. (2015) report results showing that stricter EPL tends to reduce investments per worker particularly in the case of sunk capital intensive industries.

an order of magnitude very similar to the baseline model.[26]

We consider the possibility of a differential effect of employment protection legislation depending on each country distance from the technology frontier in column 9. Indeed, previous works have found that the negative effect of EPL on labour productivity and TFP growth is higher in the case of countries closer to the technology frontier.[27] Regression results suggest that, in the case of the entry regression, the effect of EPL is stronger in the case of countries with higher levels of TFP. For instance, at the 25th percentile of the relative TFP distribution, the coefficient of the reallocation-EPL interaction is -0.025, barely significant at the 10% level, while at the 75th percentile the coefficient takes on a value of -0.15 and highly significant. This result could be explained by arguing that EPL discourages drastic innovation (Saint Paul, 2002) and that the latter is more likely to come from new entrants. Indeed, if drastic innovation is more important for countries closer to the technology frontier, then one might expect that entry is discouraged by higher levels of EPL mostly in countries near the technology frontier. In turn, in countries far from the frontier firms might realize that imitation of foreign best practice technologies is likely to make productivity growth easier and therefore might be less discouraged by high levels of EPL.

Finally, firms may react to external shocks not only by adjusting on the extensive margin, but also exploiting the intensive margin, so that the possible negative effect of EPL on adjustment costs might be attenuated (Llosa et al., 2014). In order to control for this possibility, in columns 10 we report estimates of a regression specification where we include both the country-sector level of hours worked per employee and its interaction with Reallocation and EPL. Interestingly, we find that in countries/industries characterized by a larger intensive margin the negative impact of EPL on firm turnover is somewhat reduced.[28]

[26]In regressions not reported but available from the authors upon request, we have controlled for the interaction between employment protection and growth opportunities in US industries, and the R&D intensity in the US. Again, our main results are unaffected.

[27]See, for instance, Conti and Sulis (2016) for empirical evidence and Aghion and Howitt (2006) for a theoretical discussion.

[28]Similarly, another possible margin of adjustment is wage flexibility. Hence, in regressions not reported, but available upon request, in our baseline specification we control for the country/sector specific ratio of labour costs on gross output. Our results are virtually unaltered.

4.3 Disentangling employment protection legislation

As noted in the data section, the OECD employment protection index that we have been using so far is the weighted average of different legislative provisions related to severance pay, notification procedures, procedural inconveniences, difficulty of dismissals as well as the additional regulations concerning collective versus individual dismissals. Bassanini and Garnero (2013) have found that only some of these provisions matter in shaping the effects of EPL on worker flows; therefore it might be worth trying to disentangle the effects of the main components behind the EPL indicator on firms' entry and exit rates. In what follows, the subindexes are always adjusted to take into account law enforcement, as discussed in previous sections and in Appendix A.3.

We extend our baseline specification in columns 1 and 5 of Table 6 by breaking down the OECD EPL index into its individual (EPL Individual) and collective (EPL Collective) regulation components. Empirical results show that both components have a negative effect in reallocation-intensive industries in the case of the exit regression, with collective dismissals that is only slightly imprecisely estimated in the entry regression: this suggests that regulations of collective dismissals might impose an additional burden on firms and that therefore should receive by policymakers at least as much interest as regulations on individual dismissals.

In columns 2 and 6 we break down the individual dismissal index into the three high-level components considered by the OECD, namely procedural inconveniences (Procedural Inconveniences), notice and severance payments (Severance Pay) and difficulty of dismissals (Difficulty Dismissal). Empirical results show that procedural inconveniences are negatively associated to entry rates in reallocation intensive industries, while the interaction term related to difficulty of dismissal is negative and statistically significant in the case of exit rates and negative but marginally insignificant (the p value is 0.13) in the case of entry rates. Moreover, the interaction term involving the indicator for collective dismissals is now negative and statistically significant in both regressions.

If we further disentangle the effect of difficulty of dismissal into its main components

Table 6: Robustness analysis on EPL indicators and test of Poschke (2009)

Dependent Variables:	Entry Rate					Exit Rate				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Reallocation × EPL Collective	-0.0276	-0.0304*	-0.0253		-0.0320**	-0.0452***	-0.0669***			
	(0.0184)	(0.0170)	(0.0240)		(0.0155)	(0.0144)	(0.0169)			
Reallocation × EPL Individual	-0.0604***				-0.0377***					
	(0.0226)				(0.0139)					
Reallocation × Procedural Inconveniences		-0.0347**	-0.0330**			-0.00520	-0.0162			
		(0.0152)	(0.0152)			(0.00745)	(0.0137)			
Reallocation × Severance Pay		0.00138	-0.00365			-0.000590	0.00224			
		(0.0144)	(0.0148)			(0.0117)	(0.0118)			
Reallocation × Difficulty Dismissal		-0.0255				-0.0395***				
		(0.0168)				(0.0136)				
Reallocation × Unfair Dismissal			0.00374				-0.0150			
			(0.0126)				(0.00935)			
Reallocation × Trial Length			-0.00602				0.0135			
			(0.0167)				(0.0113)			
Reallocation × Compensation			-0.00378				-0.00743			
			(0.0118)				(0.0130)			
Reallocation × Reinstatement			-0.0133*				-0.0132***			
			(0.00698)				(0.00387)			
Reallocation × EPL				-0.0942***				-0.0588***	-0.0941***	-0.0424*
				(0.0255)				(0.0181)	(0.0188)	(0.0247)
Reallocation × EPL Temporary				0.0481***				0.00416		
				(0.0161)				(0.0127)		
Weights	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Observations	327	327	327	327	290	290	290	290	98	121
R-squared	0.696	0.700	0.704	0.705	0.804	0.810	0.815	0.803	0.938	0.791

Notes: Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Dependent variable in columns 1-4 (5-10) is the average Entry (Exit) rate of employer enterprises over the period 2004-2007. EPL subindexes are always adjusted with law enforcement indicators, see subsection 3.3 and Appendix A.3 for more details. Controls and other main variables are defined in Table 3. Analytical weights are the number to employees at the country-industry level. Reallocation is sectoral US worker reallocation from Bassanini and Garnero (2013). EPL for temporary contracts is obtained from the OECD, see also subsection 3.3 for more details. In column 9, we include the set of countries where either bankruptcy is one of the eligible contingencies to receive severance pay (i.e. Hungary and Spain) or firms face restrictions in firing workers after the start of a bankruptcy procedure (i.e. Austria and Norway); in column 10 we include other countries but Belgium, The Netherlands and Finland. See Section 4.4 for more details.

(columns 3 and 7), namely definition of unfair dismissal (Unfair Dismissal), possibility of reinstatement (Reinstatement), compensation for unfair dismissal (Compensation) and length of trial period (Trial Length), we find, as in Bassanini and Garnero (2013), that the major driver of both entry and exit rates in reallocation-intensive industries seems to be the possibility of reinstatement. Indeed, an higher frequency of reinstatement ordered by courts might introduce uncertainty, increase legal expenses and discourage firms' entry in high-reallocation intensive industries. Moreover, an increase in uncertainty might lead firms to experiment less and this in turn might also lead to lower exits in high reallocation intensive sectors. Interestingly, in the exit regression the definition of unjust or unfair dismissal is negative and with a level of statistical significance very close to 10% (p value 0.11). Indeed, in tightly regulated labour markets, workers capability or redundancy are not an adequate and sufficient ground for dismissal; so that, as argued by Scarpetta et al. (2002), the adoption of new technologies might be hampered. As a matter of fact, the restriction a firm faces in order to reduce certain types of workers (particularly severe in those countries where the worker capability might not even be ground for dismissal) might attenuate the incentive to adopt the new technologies that require more experimentation. As a result, firms in countries with stricter definition of unfair dismissals might experiment less and stick to more mature and already experimented technologies, thereby reducing the number of failures and the exit rate in reallocation intensive industries.

While we should be cautious in our ability to accurately distinguish the effect of these separate provisions on entry and exit rates, our results suggest that it might be important for policymakers to focus on the difficulty of dismissal as perhaps the main element of EPL that imposes a significant burden on firms.[29]

So far we have considered an EPL index that focuses only on regular workers.[30] Therefore, in columns 4 and 8 we include the OECD index of employment protection for temporary

[29]Moreover, our results are also somewhat sensitive to whether regressions are weighted or not.

[30]In regressions not reported but available upon request we have considered an alternative EPL indicator, namely the hiring and firing cost index of Botero et al. (2004), adjusted using the same procedure employed in the case of the OECD index, and we find that higher hiring and firing costs are associated to lower entry and exit rates in the case of high reallocation sectors, broadly confirming the findings based on the OECD EPL index

workers. Reassuringly, the EPL index for regular workers is negative and statistically significant. By way of contrast, the index for temporary workers is largely insignificant in the case of the exit regression while, surprisingly, it is positive and significant in the case of entry.[31]

4.4 Testing the hypothesis of Poschke (2009)

In the next columns we seek to directly test the main insight of Poschke's (2009) model, namely that employment protection regulation should be associated to lower exit rates only insofar as firing costs are borne also by exiting firms, and not only by continuing ones, when in turn one should expect a positive effect of EPL on exit rates.

It is important to stress at the outset that testing Poschke's prediction is not straightforward. The main reason is because there is empirical evidence that exit by bankruptcy usually accounts for only a fraction of total exits.[32] Moreover, in the case of voluntary liquidation it seems plausible to argue that exiting firms are bound to pay firing costs, "since firm exit cannot be realised without collective dismissal on some scale", as recently noted by McGowan and Andrews (2016). For this reason, although the model of Poschke (2009) implies that in countries where firing costs are imposed only on continuing firms, stricter EPL should lead to higher exit rates, we do not expect this to happen in our data because a large share of exits are voluntary liquidations and, in that case, we expect firms to pay firing costs.[33]

Having said this, because there are differences across countries in the way bankruptcy laws

[31]It is not clear why stricter rules governing the employment of temporary workers should lead to more entry in worker reallocation intensive industries. However, it is important to note that this result is not very robust. Indeed, both the magnitude and the statistical precision fall (p value 0.44) if we do not weight by country-sector employment; in second place, controlling for alternative labour market institutions reduces the magnitude of the coefficient by about 80% driving it to statistical insignificance. Moreover, Bentolila et al. (2012) argue that, in the case of Spain, firms are never monitored by the government in order to ensure compliance with the reasons underlying hiring under a temporary working scheme (a point also raised more generally by Bassanini and Garnero, 2013), casting doubts on the effective reliability of the OECD EPL index for temporary workers.

[32]Balcaen et al. (2012) report evidence for Belgium showing that 41% of firms in their sample exit through a court driven procedure, 44% were voluntary liquidated and 14% exit through mergers and acquisitions. García-Posada and Mora-Sanguinetti (2014) report data for Spain showing that in the case of micro firms bankruptcies are a tiny fraction of total exits, while they are the usual form of exit in the case of larger firms. Moreover, it is also important to bear in mind that not all firms filing for bankruptcy exit from the market.

[33]Moreover, as recently suggested by Danthine et al. (2016), the generosity of particular components of firing costs, such as severance payments, are affected by the bargaining process between firms and unions.

treat firing costs (Holzman et al., 2012), one could still expect to find a stronger negative effect of EPL on exit rates in those countries where firing costs are borne also by firms exiting through insolvency procedures. Holzmann et al. (2012) report eligible contingencies for severance pay (e.g. redundancy, incapacity, bankruptcy, etc.) for most countries and argue that, in the case of countries in our sample, only in Hungary and Spain bankruptcy is one of the eligible contingencies for receiving severance pay.[34] Moreover, Djankov et al. (2008) argue that, for our sample, the start of a bankruptcy procedure restricts firms from firing workers only in Austria and Norway.

We have used this information in order to identify the set of countries where either bankruptcy is one of the eligible contingencies to receive severance pay (i.e. Hungary and Spain) or firms face restrictions in firing workers after the start of a bankruptcy procedure (i.e. Austria and Norway). Indeed, we believe that in these four countries the monetary and non-monetary costs associated to firing workers are more likely to be borne also by firms that exit through an insolvency procedure. In order to test this hypothesis in columns 9 and 10 of Table 6 we report estimates obtained after splitting the sample according to this classification of countries and interestingly we find results that are consistent with Posckhe's hypothesis. Regression results suggest that the coefficient of the interaction term between EPL and worker reallocation doubles in the case of countries where we expect firms to pay monetary and non monetary firing costs even during a bankruptcy procedure. Moreover, the two coefficients reported in columns 9 and 10 are quite tightly estimated so that they are statistically different from each other at the 10% level of significance.[35] Interestingly, if we split the sample in this way also in the case of the entry regression, we do not find any difference (neither statistical nor economic) in the effects of employment protection legislation. This is potentially an important result, because whether firing costs are imposed only on continuing or also on exiting firms should not affect the relationship between entry

[34]In the case of Belgium, The Netherlands and Finland the authors do not report information on the eligible contingencies: therefore we do not consider these countries in what follows. In turn, for the remaining countries in our sample, bankruptcy is not mentioned among the eligible contingencies.

[35]If we do not weight by country-sector employment the difference shrinks and it is no longer statistically significant.

rates and employment protection legislation in Poschke's (2009) model. Indeed, not finding any differential effect of EPL on entry rates might provide us with a robustness check very much in line with the difference-in-difference approach to identification.

4.5 Firm size

Overall results suggest that EPL might indeed deter firms' entry and exit in worker reallocation-intensive industries; however, it is possible that the effect we have found masks some heterogeneity along the firm-size distribution. It might be the case that firms react to the burden imposed by EPL either reducing entry (and exit) or entering in the market with a larger scale in order to spread the fixed costs component of EPL on a larger scale. By way of contrast, in a few countries some regulations are imposed only on large firms, therefore EPL might reduce firm turnover particularly in the case of large enterprises. While it would be interesting to be able to split the sample into many different size classes, data availability and sample size considerations allow us a meaningful split into two size classes only, namely 1-9 employees and 10 plus employees. Nevertheless, our data, as well as those of Klapper et al. (2006), suggest that in most countries and industries the bulk of entering firms falls into the 1-9 category. In the descriptive section of the paper we showed that entry and exit are mostly a small firms phenomenon, with an average share of small firms' entry and exit of about 95%.

In Table 7, we report the baseline regressions for both entry and exit rates. Regression results for the 1-9 category (top panels) suggest that EPL has a negative and statistically significant effect on both entry and exit rates in the case of reallocation-intensive sectors, with magnitudes very similar to those found for the whole sample. In turn, regression results in the bottom panels of Table 7 show that the coefficients of the interaction term between EPL and worker reallocation are much smaller and, in the case of the entry regressions, are generally not even statistically significant, with the exception of the IV estimates. This difference between the small and larger size category might suggest that, notwithstanding the fact that in some countries some EPL provisions are imposed only on larger firms, the

Table 7: Baseline regressions. Firm size

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Estimation Method	OLS	OLS	OLS	GLM	IV	OLS (UK Reall.)	Benchmarking Bias
Weights	Yes	No	Yes	Yes	Yes	Yes	Yes
				Firms 1-9 Employees: Entry Rate			
Reallocation × EPL	-0.0573**	-0.0601	-0.0499*	-0.00567**	-0.120***	-0.0444	-0.232***
	(0.0276)	(0.0409)	(0.0284)	(0.00277)	(0.0277)	(0.0293)	(0.0619)
Controls and Dummies	yes	yes	no	yes	yes	yes	yes
Observations	302	305	302	302	302	302	302
R- squared	0.798	0.587	0.772		0.744	0.787	
				Firms 1-9 Employees: Exit Rate			
Reallocation × EPL	-0.0428**	-0.0560***	-0.0425*	-0.00637***	-0.0880**	-0.0268	-0.185***
	(0.0195)	(0.0205)	(0.0223)	(0.00200)	(0.0356)	(0.0203)	(0.0368)
Controls and Dummies	yes	yes	no	yes	yes	yes	yes
Observations	278	279	278	278	278	278	278
R- squared	0.843	0.713	0.807		0.809	0.833	
				Firms 10 plus Employees: Entry Rate			
Reallocation × EPL	-0.0126	-0.00338	-0.0103	-0.00224	-0.0347**	-0.0128	-0.342
	(0.00903)	(0.00853)	(0.00945)	(0.00314)	(0.0158)	(0.0133)	(0.222)
Controls and Dummies	yes	yes	no	yes	yes	yes	yes
Observations	303	307	303	303	303	303	303
R- squared	0.708	0.456	0.565		0.312	0.707	
				Firms 10 plus Employees: Exit Rate			
Reallocation × EPL	-0.0223***	-0.0282***	-0.0206**	-0.00853***	-0.0404***	-0.0244**	-0.0723***
	(0.00805)	(0.00906)	(0.00795)	(0.00324)	(0.00975)	(0.0101)	(0.0268)
Controls and Dummies	yes	yes	no	yes	yes	yes	yes
Observations	272	276	272	272	272	272	272
R- squared	0.761	0.568	0.669		0.276	0.259	

Notes: Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Dependent variable in top (bottom) panels is the average Entry (Exit) rate of employer enterprises over the period 2004-2007 for each firm size category. Analytical weights are the number to employees at the country-industry level. Reallocation is sectoral US worker reallocation and it is taken from Bassanini and Garnero (2013). EPL is the OECD indicator for Employment Protection Legislation averaged over the period 2004-07; it is calculated as the weighted sum of sub-indicators concerning the regulations for individual dismissals and additional provisions for collective dismissals and adjusted according to the Law Enforcement Index in Table 2. Other controls are the country-industry share of self-employed (Self-employed), the share of medium educated (Med. Educated), the share of low educated (Low Educated) and the share of temporary contracts (Temporary) from Bassanini and Garnero (2013) and are calculated as average values over the period 2004-2007. Country and industry dummies are included. In cols. 1 to 4 estimation method is OLS. In col. 4 estimation is GLM. In col. 5 instruments are dummies "Socialist" and "Facilitator" interacted with Reallocation and discussed in Subsection 4.1. In col. 6 the UK reallocation rate is taken from Bassanini and Garnero (2013). In col. 7, the estimation method is the two-step IV estimator proposed by Ciccone and Papaioannou (2010) and discussed in detail in Appendix B.

fixed cost components associated to employment protection legislation makes the latter more binding in the case of small firms: as a result, stricter EPL tends to reduce firm turnover rates less in the case of larger firms. This fits quite well with previous literature, which has highlighted how firms in the US tend to enter on a smaller scale than in the case of most continental European countries. Of course, it is also possible that our coarse size split forces the 10 plus category to include too much heterogeneity in firms' dimensions to allow us to draw any definite conclusion. Further sample splits based on different sizes would help to better understand such findings, but unfortunately we miss the relevant information.

5 Conclusions

In this paper, we have studied the role of employment protection legislation in shaping firms' incentives to enter and exit. Our main empirical finding is that both entry and exit rates are reduced by stricter EPL in industries that are characterized by higher worker reallocation intensity. These results are robust to various sensitivity checks such as those addressing reverse causality or measurement error issues associated to using US data as a proxy of an industry's reallocation rates. We also find that both individual and collective dismissal regulations have negative effects on entry and exit rates in worker reallocation-intensive industries and that difficulty of dismissal seems to be the component of EPL most likely to affect firms' turnover. This in turn raises an important point that deserves further scrutiny in empirical studies that use aggregate indices of EPL, namely that different provisions might have different effects on firms' behaviour. Moreover, we also find that these results are mainly associated to firms in the 1-9 employees category, that represents the bulk of firms that enter or exit in most countries and industries. By way of contrast, in the case of larger firms, the evidence is less clear-cut, especially in the case of entry, perhaps for the heterogeneity characterizing that group in our sample.

The findings discussed in our paper also shed some interesting insights into the transmission channel between employment protection legislation and productivity growth. Various recent empirical studies have found that employment protection legislation is associated to

lower total factor productivity growth at the industry level (Bassanini et al. (2009) and Conti and Sulis (2016), among the others). In turn, the literature on misallocation cited in the Introduction suggests that a sizable share of sectoral productivity growth is associated to the net entry component (e.g., Foster et al., 2008). Therefore, our finding on higher firing costs associated to lower firms' turnover rates is consistent with the hypothesis that employment protection legislation might indeed tend to affect sectoral productivity growth (also) through the net entry channel. Hence, besides impairing the degree of static allocative efficiency by limiting the expansion and growth of more productive firms (as recently shown by Andrews and Cingano, 2014), employment protection legislation, by affecting the value of the firm and thereby altering the entry and exit thresholds, reduces firms' entry and exit rates and weakens dynamic allocative efficiency, thereby decreasing the level and, possibly, growth rates of total factor productivity.

A Data appendix

In this Appendix we report information on sample selection, tables for additional descriptive statistics by firm size, a careful description of law enforcement indicators and how we use them when conducting additional robustness checks.

A.1 Sample selection

Our original dataset comprises 22 countries; after our selection procedure, we end up with 13 countries. Apart from the US, that is the benchmark economy in our study, the rest of them were excluded because no information on main control variables was available in the Bassanini and Garnero (2013) dataset. This group includes: Bulgaria, Estonia, Israel, Lithuania, Luxembourg, Latvia, Romania and Slovenia. As far as sectors are concerned, we begin with 36 sectors, and we end up with 27. In particular, sectors 10_12 (Mining And Quarrying Of Energy Producing Materials) and 13_14 (Mining And Quarrying Except Energy Producing Materials) were excluded because our sectoral measure of reallocation was not available in the Bassanini and Garnero (2013) dataset. Sectors 19 (Leather, Leather Products And Footwear), 20 (Wood And Products Of Wood And Cork), 23 (Coke, Refined Petroleum Products And Nuclear Fuel), 24 (Chemicals And Chemical Products) and 29 (Machinery And Equipment, n.e.c.) were available only for the US, similarly sector 25 (Rubber And Plastics Products) and 26 (Other Non-Metallic Mineral Products) were available only for the US (and Israel).

A.2 Descriptive statistics by firm size

See Tables A1 and A2 reported in the following pages. Statistics are discussed in Subsection 3.1 in the paper.

A.3 Law enforcement indicators

There are various alternative indexes available in the literature. One is the "Contracts and law" sub-index (WCR), taken from the Global Competitiveness Report of the World Economic Forum (2006), which measures the efficiency and competitiveness of the legal system (by considering items such as the degree of judicial independence, respect of property rights, favoritism in decisions by government officials, organized crime). Possible alternatives are the "Integrity of the legal system" (EFW), taken from the Economic Freedom of the World database (also used by Haltiwanger et al., 2014) or the "Rule of Law" indicator (RL), which is taken from the World Bank World Governance Indicators Database. The former index seeks to measure the strength and impartiality of the legal system as well as the popular observance of the law, while the latter seeks to measure the perception of the extent to which agents have confidence in

Table A1: Descriptive statistics. Industry level by firm size

	Size 1-9 Employees					Size 10 Plus Employees				
Industry: Code and Description	Obs.	Entry	Obs.	Exit	N. Firms (s.d.)	Obs.	Entry	Obs.	Exit	N. Firms (s.d.)
15_16 Food Products, Beverages And Tobacco	12	7.94	12	8.63	6958 (11387)	12	1.49	12	2.21	2048 (1966)
17_18 Textiles And Textile Products	12	9.13	11	12.86	5188 (8177)	12	1.9	11	3.51	1706 (2647)
21_22 Pulp, Paper, Paper Products, Printing And Publishing	11	9.51	11	9.75	4279 (4583)	11	1.57	11	2.56	1264 (1313)
27_28 Basic Metals And Fabricated Metal Products	13	9.55	12	7.98	9234 (13572)	13	1.7	12	1.92	3268 (4610)
30_33 Electrical And Optical Equipment	12	8.76	11	8.85	3614 (4512)	12	1.35	11	1.97	1187 (1579)
34_35 Transport Equipment	12	10.55	11	8.66	788 (922)	11	1.53	10	1.85	572 (627)
36_37 Manufacturing N.E.C. And Recycling	12	8.48	12	9.25	4674 (6011)	11	1.51	11	2.38	1338 (1691)
40 Electricity, Gas, Steam And Hot Water Supply	8	14.34	4	6.45	295 (177)	8	1.73	3	2.94	174 (106)
41 Collection, Purification And Distribution Of Water	8	9.02	5	5.73	107 (50)	9	1.42	4	3.5	61 (75)
45 Construction	13	13.15	12	10.42	58362 (81288)	13	2.61	12	3.1	9445 (12392)
50 Sale Of Automotive Fuel	12	8.46	11	7.31	16162 (19551)	12	1.44	11	1.71	2214 (1899)
51 Wholesale, Trade And Commission Excl. Motor Vehicles	12	10.66	11	9.22	33183 (33042)	12	1.43	11	1.76	6116 (5481)
52 Retail Trade Excl. Motor Vehicles - Repair Of Household Goods	13	10.4	12	9.94	67218 (81127)	13	2.06	12	2.22	4570 (3056)
55 Hotels And Restaurants	13	12.81	12	11.69	42403 (55274)	13	3.15	12	2.8	4025 (3744)
60 Land Transport - Transport Via Pipelines	13	10.99	12	9.78	15915 (20845)	13	1.71	12	2.33	2263 (1922)
61 Water Transport	12	12.67	10	12.33	373 (512)	13	2.44	10	2.54	89 (79)
62 Air Transport	11	14.09	10	13.09	44 (33)	11	1.9	11	2.04	34 (29)
63 Supporting And Auxiliary Transport Activities	13	11.71	12	8.73	3608 (4218)	12	2.42	12	2.33	1076 (1213)
64 Post And Telecommunications	12	20.41	10	15.94	868 (1043)	12	3.14	10	3.46	231 (268)
65 Financial Intermediation, except insurance and pension funding	12	14.59	11	9.5	994 (1354)	12	2.07	11	2.27	354 (298)
66 Insurance And Pension Funding, ex. compulsory social security	11	11.85	10	9.88	115 (139)	12	2.14	11	1.2	86 (62)
67 Activities Related To Financial Intermediation	13	13.85	11	11.3	6390 (7863)	13	2.73	11	3.21	275 (292)
70 Real Estate Activities	7	15.99	6	10.83	20887 (29569)	7	3.66	6	4.8	1158 (1186)
71 Renting Of Machinery And Equipment	12	14.2	11	11.69	2448 (3133)	13	2.41	12	2.64	255(290)
72 Computer And Related Activities	12	15.24	12	10.65	7425 (7281)	13	2.24	12	2.16	1132 (1059)
73 Research And Development	12	20.61	11	14.56	596 (525)	12	1.93	10	1.93	129 (79)
74 Other Business Activities	2	14.2	2	9.88	19482 (7341)	2	3.96	1	2.36	3110 (1281)

Notes: Descriptive statistics have been calculated on the sample used in baseline regressions (Table 7 col. 1). Industries codes follow the ISIC Rev 3 Classification (see http://www.oecd.org/sti/ind/40729523.pdf) Definitions: Entry is the average entry rate of employer enterprises, Exit is the average exit rate of employer enterprises. More information on the dataset is available at this link: http://www.oecd.org/std/business-stats/eurostat-oecdmanualonbusinessdemographystatistics.htm, see Section 5 (7) of the manual for definitions of birth (death) events. N. Firms is the average of number of employer enterprises in each sector over the sample period with its standard deviation. See Section 3 for more details.

Table A2: Descriptive statistics. Country level by firm size

Size 1-9 employees					
Country	Obs.	Entry rate	Obs.	Exit rate	N. Firms (s.d.)
Austria	27	10.13	27	9.59	5478 (8695)
Belgium	18	4.38	14	2.58	6365 (8472)
Czech Republic	25	12.24	25	11.08	5357 (8737)
Denmark	26	13.37	26	13.55	2505 (3673)
Finland	27	12.46	25	9.8	3114 (4432)
Hungary	21	15.16	19	13.16	7546 (12863)
Italy	26	13.38	25	9.65	38183 (59823)
Netherlands	26	14.91	24	11.78	7712 (10516)
Norway	24	9.21	24	5.95	2498 (3900)
Portugal	23	15.52	23	16.4	24894 (42257)
Slovakia	23	12.58	23	8.27	4340 (7096)
Spain	21	11.65	20	9.18	54096 (77123)
Sweden	18	12.28	0	n.a.	7248 (8528)
Size 10 plus employees					
Country	Obs.	Entry rate	Obs.	Exit rate	N. Firms (s.d.)
Austria	27	1.82	27	1.44	1199 (1519)
Belgium	18	0.66	15	0.61	1238 (1338)
Czech Republic	25	2.42	23	1.83	1389 (1673)
Denmark	26	2.2	26	4.55	609 (837)
Finland	27	1.82	24	3.63	606 (711)
Hungary	21	2.46	19	3.17	908 (1134)
Italy	26	1.84	25	1.56	5101 (6070)
Netherlands	26	2.64	24	2.45	2074 (2770)
Norway	24	1.51	24	0.89	723 (957)
Portugal	23	2.11	23	2.43	1621 (2206)
Slovakia	23	4.03	23	3.6	730 (829)
Spain	22	2.31	19	2.5	6525 (10020)
Sweden	19	0.67	0	n.a.	1238 (1371)

Notes: Descriptive statistics have been calculated on the sample used in baseline regressions (Table 7 col. 1). Average values for entry and exit rates over period 2004-2007 are reported. N. Firms is the average of number of employer enterprises in each country over the sample period with its standard deviation. See Section 3 for more details.

the rules of society, in the quality of contracts enforcement, property rights, the police and the likelihood of crime. Although capturing somewhat different dimensions of the functioning of the legal system, these three indexes are highly correlated (between 0.92 and 0.96), thus suggesting that they hopefully capture the same underlying phenomena. We have therefore chosen as our preferred indicator the WCR one, although we also show below that baseline results are robust to using the other two indexes.

Following Haltiwanger et al. (2014), we build an adjusted measure of EPL as follows: EPL Adj.$= EPL \times \frac{WCR}{6.27}$. Indeed, 6.27 is the highest level of WCR in the world as of 2006 (Denmark): therefore, for all countries in our sample but Denmark, "effective" EPL is reduced with respect to "formal" EPL by an amount that inversely depends on the efficiency and competitiveness of the legal system. In our sample we note that there is a non-negligible variation in the degree of efficiency of the legal system (the standard deviation is 0.9 in the range 3.6-6.27 in the case of the WCR indicator); moreover, countries with stricter EPL tend to have slightly lower efficiency of the legal system (the correlation coefficient between the OECD EPL index and WCR is -0.29), suggesting that controlling for the degree of enforcement might actually be important to correctly assess the impact of EPL on firm turnover. Note also that the correlation coefficient of the OECD EPL indicator with the EFW and RL variables are -0.30 and -0.38, respectively.

B The Ciccone and Papaioannou (2010) estimator

In order to deal with the possible biases associated to the simple Rajan and Zingales' (1998) estimation framework, Ciccone and Papaioannou (2010) have proposed a two-step IV approach. The authors start from the following equation:

$$Y_{s,c} = \beta z_{s,c} x_c + e_c + e_s + e_{s,c}. \tag{B1}$$

where $z_{s,c}$ is the characteristic that varies at both sector and country level (e.g., the intrinsic country specific need for reallocation in a particular industry), while x_c is the country characteristic (e.g. EPL), and e_c and e_s are country and industry fixed effects. Because country level data on $z_{s,c}$ are often not available and, even if available, might depend on country specific policies, researchers should in principle estimate a regression equation like the following one:

$$Y_{s,c} = \beta z_s x_c + e_c + e_s + e_{s,c}. \tag{B2}$$

where z_s captures a "global" industry characteristic, common to each country (e.g., the technology and market-driven reallocation intensity in sector s). Because the latter is unobservable, researchers estimate the following regression (i.e., our equation (1)):

$$Y_{s,c} = \beta z_{sUS} x_c + e_c + e_s + e_{s,c}. \tag{B3}$$

where the "global" industry characteristic is proxied by the industry characteristic in the US. Because, for the reasons already discussed, Ciccone and Papaioannou (2010) show that the use of the US industry characteristic instead of the "global" one might lead to both attenuation and amplification bias, they propose to use a two-step IV estimator. Their approach rests on the hypothesis that we observe an industry characteristic which is proportional to the "global" industry characteristic: $m_s = z_s\mu$. This assumption allows us to estimate the above equation by IV using $m_s x_c$ as an instrument for $z_{sUS}x_c$. In order to derive this estimator, Ciccone and Papaioannou (2010) note that equation (B2) can be re-written as:

$$Y_{s,c} = m_s x_c + e_c + e_s + e_{s,c}. \tag{B4}$$

where the industry-specific slopes $m_s = \beta z_s$ are proportional to z_s provided $\beta \neq 0$. Ciccone and Papaioannou (2010) argue that the industry specific slopes in equation (B4) can be estimated by regressing the dependent variable on country and industry fixed effects as well as the country characteristic interacted with a full set of sector dummies using OLS. If the industry specific slopes are jointly significant, one can use $\widehat{m_s}x_c$ as an instrument for $z_{sUS}x_c$. In our empirical application, the Ciccone and Papaioannou (2010) benchmarking bias approach can be implemented by regressing entry and exit rates on a set of industry and country fixed effects plus EPL, whose slope is allowed to vary across industries, as in the following equation:

$$Y_{s,c} = \rho_s EPL_c + e_c + e_s + e_{s,c}. \tag{B5}$$

Where e_c and e_s represents country and sector fixed effects; $e_{s,c}$ is a conventional error term, while ρ_s is a sector specific slope. Secondly, we derive $\widehat{m_s}$ as:

$$\widehat{m_s} = \widehat{\rho_s}. \tag{B6}$$

Finally, the interaction $\widehat{m_s} \times EPL_c$ is used as an instrument for $Reallocation_s \times EPL_c$. An application of this two-step estimator can be also found in Bassanini and Garnero (2013).

C Additional robustness

In this section we show, both for unadjusted and adjusted-EPL, that results do not depend on the presence of controls or on the use of weights. In the case of exit (Panel B in Table C1) the interaction of Reallocation with EPL is always statically significant at least at 10%. In turn, in the case of entry (Panel A in Table C1), the p values are always below 0.10 with one exception, where the p value is 0.108. It is important to stress that our main results do not hinge upon the use of industry-country employment as weights. Indeed, using the number of firms in the country-industry cells leads to very similar results. Similarly, results are barely altered if we experiment using the

square roots or the logarithm of employment as weights, therefore attenuating the importance of high-employment cells with respect to a weighting scheme based on employment levels.

Given the low number of sectors and, especially, countries that are included in our sample, it is important to test whether results are sensitive to the exclusion of a single industry or country. For this reason, we have re-run the regressions reported in column 1 of Table 3 after dropping alternatively one industry or one country at a time. In Figure C1 in Appendix C we report the point estimates as well as the 90% confidence intervals of this exercise. Although results appear somewhat sensitive to the exclusion of one industry (Hotel and Restaurants) and some countries (Portugal, Spain and The Netherlands), the effect of labour regulation is always statistically insignificant at 10% levels.

Table C1: Additional robustness on using law enforcement to adjust EPL, weights and controls

Dependent Variable:	Entry Rate							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Reallocation × EPL	-0.0856***	-0.0799**	-0.0858***	-0.0487**	-0.0426*	-0.0673**	-0.0403**	-0.0299
	(0.0308)	(0.0370)	(0.0302)	(0.0245)	(0.0246)	(0.0277)	(0.0199)	(0.0186)
Observations	327	327	327	332	332	327	332	332
R-squared	0.696	0.688	0.677	0.604	0.598	0.683	0.602	0.597
EPL adjusted	yes	yes (EFW)	yes	yes	yes	no	no	no
Weights	yes	yes	yes	no	no	yes	no	no
Controls	yes	yes	no	yes	no	yes	yes	no
Dependent Variable:	Exit Rate							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Reallocation × EPL	-0.0580***	-0.0557**	-0.0556***	-0.0575***	-0.0527***	-0.0661***	-0.0607***	-0.0556***
	(0.0193)	(0.0229)	(0.0194)	(0.0186)	(0.0185)	(0.0190)	(0.0196)	(0.0178)
Observations	290	290	290	293	293	290	293	293
R-squared	0.802	0.796	0.792	0.732	0.720	0.797	0.732	0.720
EPL adjusted	yes	yes (EFW)	yes	yes	yes	no	no	no
Weights	yes	yes	yes	no	no	yes	no	no
Controls	yes	yes	no	yes	no	yes	yes	no

Notes: Dependent variable in top (bottom) panels is the average Entry (Exit) rate of employer enterprises over the period 2004-2007. Analytical weights are the number to employees at the country-industry level. Reallocation is sectoral US worker reallocation and it is taken from Bassanini and Garnero (2013). EPL is the OECD indicator for Employment Protection Legislation averaged over the period 2004-07; it is calculated as the weighted sum of sub-indicators concerning the regulations for individual dismissals and additional provisions for collective dismissals and adjusted according to the Law Enforcement Index reported in Table 2 and discussed in Appendix A.3. Controls are the country-industry share of self-employed (Self-employed), the share of medium educated (Med. Educated), the share of low educated (Low Educated) and the share of temporary contracts (Temporary) from Bassanini and Garnero (2013) and are calculated as average values over the period 2004-2007. Country and industry dummies are included. In col.2 the EPL indicator is adjusted using the "Integrity of the legal system" (EFW) indicator, taken from the Economic Freedom of the World database (also used by Haltiwanger et al. (2014) and discussed in Appendix A.3).

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Figure C1: Dropping one country and one sector at the time