ECONSTOR
Make Your Publications Visible.

A Service of

ZBW Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Marzinotto, Benedicta; Wintr, Ladislav

Working Paper

Employment protection and firm-level job reallocation: Adjusting for coverage

IWH-CompNet Discussion Papers, No. 5/2019

Provided in Cooperation with:
Halle Institute for Economic Research (IWH) – Member of the Leibniz Association

Suggested Citation: Marzinotto, Benedicta; Wintr, Ladislav (2019) : Employment protection and firm-level job reallocation: Adjusting for coverage, IWH-CompNet Discussion Papers, No. 5/2019, Leibniz-Institut für Wirtschaftsforschung Halle (IWH), Halle (Saale), https://nbn-resolving.de/urn:nbn:de:gbv:3:2-115323

This Version is available at:
https://hdl.handle.net/10419/209131

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

IWH
Halle Institute for Economic Research
Member of the Leibniz Association

CompNet
The Competitiveness Research Network

IWH-CompNet Discussion Papers

No. 5
December 2019

Employment Protection and Firm-level Job Reallocation: Adjusting for Coverage

Benedicta Marzinotto, Ladislav Wintr

Authors

Benedicta Marzinotto
University of Udine and College of Europe
E-mail: benedicta.marzinotto@uniud.it

Ladislav Wintr
Banque Centrale du Luxembourg
E-mail: Ladislav.Wintr@bcl.lu

The responsibility for discussion papers lies solely with the individual authors. The views expressed herein do not necessarily represent those of IWH. The papers represent preliminary work and are circulated to encourage discussion with the authors. Citation of the discussion papers should account for their provisional character; a revised version may be available directly from the authors.

Comments and suggestions on the methods and results presented are welcome.

IWH-CompNet Discussion Papers are indexed in RePEc-EconPapers and in ECONIS.

Editor

Halle Institute for Economic Research (IWH) –
Member of the Leibniz Association

Address: Kleine Maerkerstrasse 8
D-06108 Halle (Saale), Germany
Postal Address: P.O. Box 11 03 61
D-06017 Halle (Saale), Germany

Tel +49 345 7753 60
Fax +49 345 7753 820

www.iwh-halle.de
www.comp-net.org

ISSN 2513-1303

Employment Protection and Firm-level Job Reallocation: Adjusting for Coverage*

Abstract

This paper finds that employment protection legislation (EPL) had a significant impact on employment adjustment in Europe over 2001-2013, once we account for firm-size related exemptions to EPL. We construct a novel coverage-adjusted EPL indicator and find that EPL hinders employment growth at the firm level and increases the share of firms that remain in the same size class. This suggests that stricter EPL restrains job creation because firms fear the costs of shedding jobs during downturns. We do not find evidence that EPL has positive effects on employment by limiting job losses after adverse shocks. In addition to standard controls for the share of credit-constrained firms and the position in the business cycle, we also control for sizerelated corporate tax exemptions and find that these also significantly constrain job creation among incumbent firms.

Keywords: employment protection, firm growth, job reallocation

JEL Classification: D22, J08

* We would like to thank participants to the Labour Market Workshop in Luxembourg for their constructive comments. We are particularly grateful to Paolo Guarda for his detailed comments and suggestions. This paper should not be reported as representing the views of the BCL or the Eurosystem. The views expressed are those of the authors and may not be shared by other research staff or policymakers in the BCL or the Eurosystem.

Non-technical summary

This paper estimates the impact of employment protection legislation (EPL) on firm-level job reallocation in Europe over 2001-2013. In standard economic models, EPL increases labour adjustment costs for firms and restrains job creation and job destruction. However, the empirical evidence on the link between labour regulation and job reallocation is surprisingly inconclusive.

We contribute to the literature by addressing one of the shortcomings of the most common EPL indicator. The widely used index provided by the OECD does not account for the fact that many countries exempt smaller firms from EPL provisions. We collect granular qualitative information on firm-size exemptions to EPL by country, regulation type and year, following the same method as the OECD. This allows us to adjust the OECD indicators in a consistent fashion, preserving comparability.

To assess the effect of EPL on employment growth, we exploit a new cross-country dataset collected by the Competitiveness Network (CompNet). This dataset was compiled using a common protocol on firm-level data in each country covered. The aggregated dataset contains information on firm transitions between different size classes. More specifically, for every country, sector and initial size class, the dataset includes information on those firms that moved to a higher size class, to a lower size class or that remained in the same size class over a three-year window. The sub-sample of the CompNet dataset used in the paper covers nine European countries (Belgium, Denmark, Estonia, Finland, Italy, Latvia, Portugal, Slovenia, and Spain), nine macroeconomic sectors and five size classes over the period 2001-2013.

Unlike standard EPL indicators, our coverage-adjusted EPL measures have significant effects on job reallocation by firms in our dataset. We find that firms below EPL exemption thresholds were

discouraged from creating jobs, arguably to avoid stricter regulation. In general, considering all size classes and countries, EPL hindered firm-level job creation, suggesting that firms feared the cost of shedding labour during downturns, and increased the share of firms remaining in the same size class. We do not find evidence that EPL had positive effects by limiting job losses after adverse shocks. The estimated impact of EPL remains largely unchanged when accounting for the share of credit-constrained firms and the position in the business cycle. In addition to EPL, we also find that size-related corporate tax exemptions significantly constrained job creation. Finally, the Great Recession did not significantly change the effects of the adjusted composite EPL indicator on firm-level job reallocation.

1. Introduction

Standard economic models suggest that looser employment protection legislation (EPL) will encourage job reallocation. Many European countries recently introduced structural reforms that lowered the level of employment protection for regular workers including Portugal (2011-2015), Spain (2012), Slovenia (2013) and Italy (2014). However, the empirical evidence on the link between labour regulation and job reallocation is surprisingly inconclusive. Some cross-country studies find that EPL hinders labour adjustment among incumbent firms and often limits firm entry and exit.[2] Other studies obtain less clear-cut results (e.g. Gal et al. 2013) possibly because the effect of EPL is masked by interaction with other factors and policies over the cycle. The evidence from single-country studies is even more ambiguous.[3]

The discrepancy between theory and empirical findings may reflect econometric issues, such as omitted variable bias in country-level studies that ignore the interaction of EPL with other domestic factors and policies, or identification issues in cross-country samples with limited variation in institutional frameworks across time and countries. Another less discussed aspect is that available EPL indicators, in particular the widely used OECD indicators, do not fully capture the complexity of labour regulation because they do not account for the fact that smaller firms are often exempted from some or all EPL provisions. The result is that the available indicators may overstate the strictness of EPL in countries with full or partial exemptions for smaller firms (OECD

[2] See for instance Bertola 1990; Micco and Pagés 2006; Messina and Vallanti 2007; Bassanini et al. 2010; Cingano et al. 2010; Haltiwanger et al. 2014; IMF 2016; Bottasso et al. 2017.

[3] See Garibaldi et al. 2004; Boeri and Jimeno 2005; Bauer et al. 2007; Schivardi and Torrini 2008; Martins 2009.

2013).[4] This is unfortunate considering that these exemptions are present in most OECD countries, and are even more prevalent in Europe.

This paper addresses this shortcoming of the EPL indicators used in the empirical literature by constructing a coverage-adjusted indicator to study the effect of EPL on firms' employment adjustment in the European Union (EU) over 2001-2013. We exploit a new cross-country dataset collected by the ESCB Competitiveness Network (CompNet) that was compiled using a common protocol on firm-level data in each country covered. The aggregated dataset contains information on firm transitions between different size classes. More specifically, in each country, sector and initial size class, the dataset includes the share and characteristics of those firms that increased employment, that shed employment, or that remained in the same size class over a three-year window. The sub-sample of the CompNet dataset used in the paper covers nine European countries (Belgium, Denmark, Estonia, Finland, Italy, Latvia, Portugal, Slovenia, and Spain), nine sectors and five size classes over the period 2001-2013.

We contribute to the literature on the economic impact of EPL and structural labour market reforms in several ways. First, we derive a novel measure of EPL that accounts for EPL exemptions related to firm size. We follow the OECD method to preserve comparability and adjust both the synthetic EPL measure and single indices related to individual and collective dismissal rules. Second, as we observe changes in EPL and in firm behaviour over 2001-2013, we are able to study the impact of the Great Recession, as well as recent structural reforms that loosened EPL in several European countries. Third, we control for other factors that might affect firms' prospects, including access to credit and the position in the business cycle, as well as size-related corporate tax exemptions, a

[4] This is true of the most recent EPL indicator (OECD 2013). Earlier versions referred to an average of costs and procedures for small and large firms in the case of Italy and Spain. However, the average was unweighted.

largely unexplored topic. This allows us to improve identification by disentangling the effects of EPL provisions from other key factors.

We check for different EPL effects on firms that increased employment and on firms that shrank employment, allowing for possible asymmetry. We also distinguish between rules for individual dismissals and for collective dismissals, since the former tend to be linked to disciplinary issues, while the latter are usually used for economic reasons. Lastly, we test whether the impact of EPL changed during the Great Recession.

Our results can be summarized as follows. In our dataset, EPL effects on employment adjustments only become significant once we use the coverage-adjusted EPL measures. We find that firms below EPL exemption thresholds were discouraged from hiring, arguably to avoid stricter regulation, with EPL acting like a tax on labour. In general, EPL hindered firm hiring, suggesting that firms feared the costs of shedding labour during downturns, and increased the share of firms remaining in the same size class. At the same time, we do not find positive EPL effects in terms of limiting job losses after adverse shocks. The estimated impact of EPL remains largely unchanged when accounting for the share of credit-constrained firms or the position in the business cycle. However, in addition to EPL, we also find that size-related corporate tax exemptions significantly constrained firm hiring. Finally, the Great Recession did not significantly change the effects of the adjusted EPL indicator.

The rest of the paper is structured as follows. Section 2 reviews the literature. Section 3 discusses the data and introduces the coverage-adjusted EPL measure. Section 4 describes our empirical strategy. Our results and robustness checks are presented in section 5. Section 6 concludes.

2. Related literature

There is a growing body of research using firm-based or firm-level data to assess the impact of firing and hiring costs on job/worker flows. By exploiting within-country variation, one can limit the omitted variable bias. However, the fact that institutional frameworks do not change much over time requires an appropriate identification strategy. The available literature has dealt with this issue by applying various types of difference-in-differences approaches.

First, single-country studies typically exploit variation between a pre- and a post-treatment period (e.g. Autor et al. 2007; Kugler and Pica 2008). Second, cross-country studies frequently classify sectors based on their intrinsic volatility (proxied by their job reallocation rate in flexible economies such as the US or the UK) to then test whether cross-country differences in the strictness of EPL explain different outcomes across sectors that are equally exposed to shocks.[5] Building on this approach, most studies find that more stringent EPL reduces the speed of labour market adjustment. Most interestingly, Micco and Pagés (2006) find that the effect on employment is driven by low entry rates and that so-called administrative costs of dismissal are more constraining than so-called monetary costs.[6] Messina and Vallanti (2007) find that EPL limits job destruction in bad times. Haltiwanger et al. (2014) find that the effect of regulation is driven more by firm

[5] Cingano et al. (2010) offer a more sophisticated strategy for classifying sectors based on their intrinsic volatility. They assume that their benchmark frictionless economy is exposed to average reallocation shocks. This allows them to reduce the endogeneity of regulation.

[6] Micco and Pagés (2006) use the terminology provided for in Botero et al (2004), for which monetary costs of dismissal alludes to the cost of firing 20 per cent of the workers (i.e. advance notice, severance pay and penalties) whether for redundancy or without just cause, whereas administrative costs quantify administrative procedures involved in dismissals.

entry and exit than by reallocation among incumbents. Bottasso et al. (2017) argue that EPL reduces both entry and exit, especially among smaller firms.

A third identification strategy focuses on size-contingent employment regulation to test for differences between firms above and below the size threshold. The evidence is generally inconclusive. Some studies find hardly any effect on firm growth (e.g. Garibaldi et al. 2004; Boeri and Jimeno 2005; Bauer et al. 2007; Martins 2009). If anything, EPL reduces the probability of dismissal (Boeri and Jimeno 2005). However, Schivardi and Torrini (2008) find that Italian firms just below the exemption threshold of 15 employees are less likely to grow than firms positioned the same distance above the threshold.

Cross-country studies analysing firm-size-related EPL exemptions may be rare because it is difficult to obtain comparable information. Among the exceptions, Gal et al. (2013) use these exemptions to explain the large variation in the employment impact of the crisis. They find that the employment response to output shocks is lower when EPL is more stringent and that individual dismissal regulations have a stronger impact than collective dismissal regulations. However, at the aggregate level, differences in the stringency of regulation only marginally explain the dispersion in aggregate employment dynamics during the crisis. Hijzen et al. (2017) find that firms around the exemption threshold are more likely to use temporary employment than those below it, arguably to circumvent constraints on regular employment that apply to larger firms.

The inconclusive results on firm-size exemptions might reflect EPL interactions with other factors and/or policies affecting firm employment decisions. Access to credit over the cycle is a natural candidate explanation. For example, Moscarini and Postel-Vinay (2012) compare the behaviour over the cycle of large firms (usually constrained by EPL) and small firms (often exempt). During

expansions, they argue that large firms tend to grow faster because they can more easily poach workers. During downturns, they argue that small firms are slower to shed jobs because they have not hired as intensively during the expansion. However, smaller firms are more likely to face credit constraints during a recession, which may force them to shed jobs. Considering both access to credit and size-related EPL exemptions, Laeven et al. (2018) compare the behaviour of small EPL-exempted Spanish firms to that of larger firms following the severe credit supply shocks of the Great Recession. The authors find that, all else equal, in the presence of credit constraints small exempted firms grew faster than large ones because they could more easily substitute expensive capital with (less regulated) labour.

In addition to access to credit and the position in the business cycle, tax policies can also affect firms differently depending on their size. For example, in most European countries smaller firms that are exempt from certain EPL regulations may still be subject to targeted corporate income taxes. While there is a long-standing literature on the efficiency of tax-related business incentives, there is much less evidence on the general-equilibrium effects of corporate tax exemptions on firm-level output distribution (see, for example, Dharmapala et al 2011), but to our knowledge, there are no studies looking at their impact on employment decisions by firms.

3. Data

3.1. Employment protection indicators

3.1.1. EPL components

EPL regimes cover all aspects of employment termination by the employer.[7] We consider the EPL related to regular contracts, which is subdivided into individual and collective dismissal regulation.

[7] Through its impact on dismissals, EPL inevitably affects hiring as well (e.g. Pissarides 2010).

The relevant indicators provided for by the OECD draw on a number of sub-indexes reflecting separate regulations. These take values between 0 and 6 (6 being the strictest regulation) and are then added up to synthetic country-level indicators using weights that are determined by labour-law experts on a relatively subjective basis.

The OECD indicator for individual dismissals covers three areas. First, procedural inconvenience (i.e. notification procedures, delay before notice becomes effective). Second, notice and severance pay for no-fault individual dismissals (i.e. length of the notice period at a tenure of 9 months, 4 years and 20 years; severance pay at a tenure of 9 months, 4 years and 20 years). Third, difficulty of dismissal (i.e. definition of unjustified and unfair dismissal, length of trial period, compensation following unfair dismissal, possibility of reinstatement following unfair dismissal, maximum time to make a claim of unfair dismissal). Similarly, the International Labour Organization (ILO) EPLex database focuses on substantive requirements, procedural requirements, and severance pay and redress for individual dismissals.

The OECD sub-indexes for collective dismissals capture costs and procedures in addition to those that apply to individual dismissals (i.e. definition of collective dismissal, additional notification requirements, additional delays, other special costs to employers).

EPL provisions may be more constraining for some size classes than for others. For example, the difficulty of dismissal may be more constraining for smaller firms because they have less scope for internalizing labour adjustment costs. This is probably why most exemptions for small firms relate to difficulty of dismissal, limiting mandatory reinstatement in cases of unfair dismissal.[8]

[8] Bassanini and Garnero (2013) find that the extent of reinstatement in the case of unfair dismissal is the most important regulatory determinant of worker flows.

Exemptions apply also to notification procedures based on legal considerations. For example, notification rules are considered more stringent in the OECD methodology when a third authority needs be informed, which is typically the case for large firms with internal work councils. Such a requirement would not apply to small firms because they are generally not obliged to have internal work councils. .

3.1.2. Limits of existing EPL indicators

OECD composite indicators for both individual and collective dismissals can potentially be quite misleading since most European countries have firm-size-related exemptions, with thresholds varying from country to country and from provision to provision.[9] The OECD indicator for collective dismissals may be less misleading, as the definition of collective dismissals refers to the lowest threshold.[10] Nevertheless, by adopting the OECD indicator, empirical studies implicitly assume that all other aspects of collective dismissals, from additional procedural requirements to additional costs to employers, apply to all firms.[11]

[9] To be fair, the OECD repeatedly acknowledged these shortcomings. Venn (2009) recalculated the OECD EPL indicators using two separate indexes for exempted and non-exempted firms and weighting them by the employment share of each firm size class. Apparently, this issue was not addressed in the subsequent literature because differences between the standard and revised indicator were not significant, except for Germany and Belgium. Nevertheless, adjusting for the employment share of non-exempted firms is important to study the macroeconomic effect of job reallocation, but might be less useful to study the effects of EPL on firm growth by size class. More recently, OECD (2013) explained the focus on provisions that only apply to large firms by noting that firm size is endogenous to regulation.

[10] Collective dismissal is defined as the lay-off of a minimum number of employees. The EPL sub-component "definition of collective dismissal" is higher for lower thresholds.

[11] For example, if collective dismissal were defined as the lay-off of at least 20 workers, the ensuing provisions would obviously not apply to firms with 1-19 employees.

The more recent EPLex database compiled by the ILO collects information on employment legislation in the area of individual dismissals, providing two separate indicators in countries with size-related exemptions (i.e. Australia, Italy, and Portugal, see ILO, 2015). Nevertheless, ILO EPLex indicators do not account for the fact that small firms are often exempted only from some and not all provisions, which implies that exempted firms might be under softer regulation rather than no regulation at all. Moreover, because the separate indicators cannot be used in datasets without firm size information. Building on the ILO dataset, Aleksynska and Eberlein (2016) offer a coverage-adjusted EPL indicator by accounting for the fact that certain provisions do not cover some individuals (e.g. the self-employed or workers in exempted firms). However, they consider only those workers that are excluded from all EPL provisions, as in ILO EPLex, but in reality, both individual workers and smaller firms tend to be excluded from only some of the rules and it is generally unusual for firms to be under no regulation at all.

3.1.3. Novel coverage-adjusted EPL indicator

To address the limits of existing indicators, we collect granular qualitative information on firm-size exemptions to EPL by country, regulation item and year, following the same method as the OECD. This allows us to adjust the OECD sub-indexes in a consistent fashion, preserving comparability. The information is collected from the OECD's documentation, in particular Venn (2009), and related country files containing qualitative information on firing regulations. An additional source is the EPLex database compiled by the ILO. Muravyev (2014) is used to complement information on Baltic states. Finally, we use the European Commission's LABREF database to identify labour market reforms affecting size-thresholds over the period 2001-2013.

Table C1 in Appendix C provides an overview of specific rules that applied in each country for which we have firm-level data as of 2013. The structure corresponds to the OECD coding. Where

relevant, the notes refer to reforms to size-related exemptions over 2001-2013 and the year of implementation. Furthermore, information is provided on the coding strategy when firms are not fully exempted from a specific rule but remain subject to lighter regulation. Exemptions for smaller firms often refer to the difficulty of dismissal. This concerns six countries in our extended sample[12] (Austria, Croatia, Germany, Italy, Portugal and Spain) at different size thresholds. Notification procedures and delays concern five countries (Austria, Finland, Germany, Italy and Portugal) at different thresholds. There are exemptions to notice and severance pay in five countries (Finland, Germany, Portugal, Slovenia and Spain). Germany is the only country that has exemptions in each of the three areas. Finally, almost all countries for which we have data exempt small firms from additional procedures and costs associated with collective layoffs (with the exception of Estonia, Latvia, Lithuania and Slovenia).

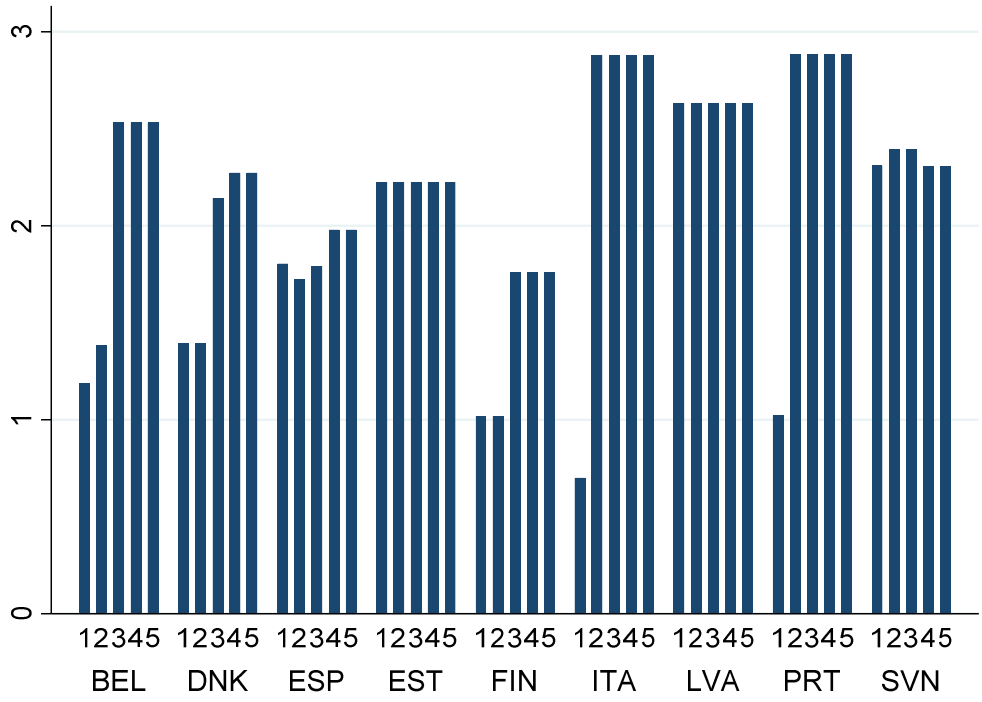
Having collected all the relevant qualitative information, we calculate our coverage-adjusted EPL indicator as follows. First, we define values of the 16 underlying indicators of OECD EPL (see Annex C) for each year and the following five firm size classes: 1-9 employees, 10-19 employees, 20-49 employees, 50-249 employees, and more than 250 employees. If a specific provision does not apply to firms below a certain threshold, the sub-index is set to zero. If exempted firms below a certain threshold are still subject to some rules, the OECD's coding method is used to construct a new quantitative index below the one provided by the OECD but above zero.[13]

[12] We have information on regulatory frameworks for a larger set of European countries than those used in the analytical section, but we had to drop some countries because of data limitations.

[13] For example, a country's general contractual regime may foresee consultation with work councils prior to dismissal. The OECD would classify this EPL regime as rather stringent, but it would be less stringent for small firms that are not required to form a work council. We thus measure stringency by accounting for the notification procedures that apply to each size class.

Second, we combine the new sub-indexes into composite indicators (for individual and collective dismissals separately as well as combined) using the same weights as the OECD to obtain more realistic indicators of the stringency of employment regulation at the size class level. Third, we multiply the adjusted composite indicators by the share of permanent workers[14] in each country. We use this indicator in our empirical analysis (Graph 1). Fourth, for illustrative purposes we aggregate the size-class specific adjusted indicators at the country-year level using employment weights for each size class and country from the Structural Business Survey (Graph 2).[15]

Graph 1: Coverage-adjusted EPL indicator for regular contracts by size class, 2009



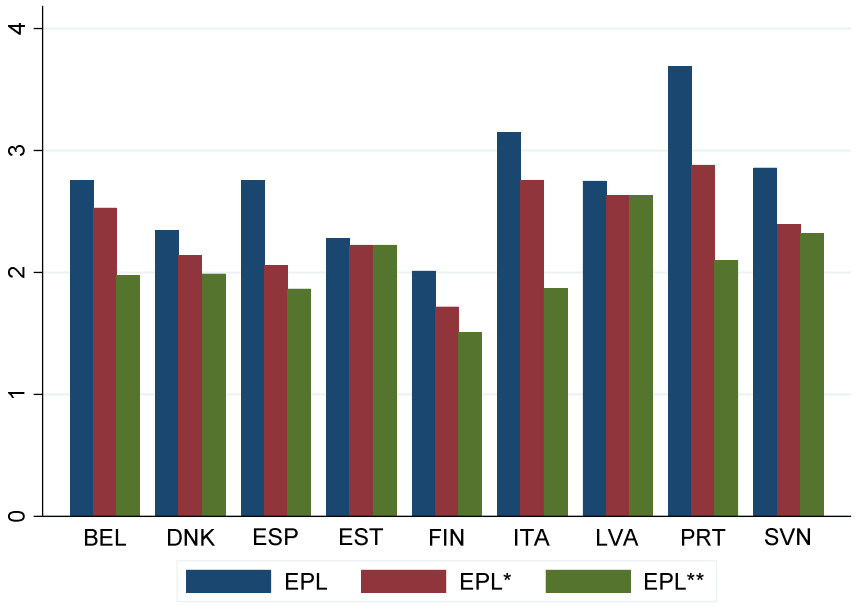
Note: Numbers 1 to 5 refer to the following size classes in terms of employees: 1-9, 10-19, 20-49, 50-249 and more than 249.

[14] The data on the share of permanent workers by country and year come from Eurostat's Labour Force Survey.

[15] For most countries, Eurostat data are only available from 2008 so we do not consider time-varying weights. The shares of employment in the size classes considered appear stable over time for most countries.

Graph 1 plots our coverage-adjusted EPL indicator for each size class and country in 2009. It shows that size-related EPL exemptions are quantitatively important in many countries, with protection either rising with firm size (e.g. Belgium, Denmark), or confined to firms above a certain threshold (e.g. Italy and Portugal).

Graph 2: OECD and coverage-adjusted EPL indicators for regular contracts at country level, 2009



Note: EPL refers to the original OECD measure; EPL* is the OECD measure scaled by the share of permanent employees and EPL** is the adjusted EPL (both scaled by the share of permanent employees and adjusted for size-related EPL exemptions).

Graph 2 provides cross-country comparisons of the original OECD EPL indicator (denoted EPL) with two adjusted versions: the OECD indicator scaled by the share of permanent employees (EPL*) along with our coverage-adjusted indicator (EPL**). It shows that relatively stringent EPL regulation may be weakened in countries with a relatively high share of temporary workers that are not covered by EPL (e.g. Portugal, Spain) as well as in countries with generous exemptions to

EPL (e.g. Portugal). In contrast, in other countries, the difference between the standard and our coverage-adjusted indicator is smaller (e.g. Estonia, Latvia).

3.2.Firm-based data

The firm-based data used in the analysis are a sub-sample from the CompNet dataset.[16] The sub-sample covers nine European countries (Belgium, Denmark, Estonia, Finland, Italy, Latvia, Portugal, Slovenia, and Spain),[17] nine macro sectors (defined roughly at the 1-digit industry level of the NACE rev. 2 classification)[18] and five size classes (1-9, 10-19, 20-49, 50-249 and more than 249 employees) over the period 2001-2013.[19] For each country, sector, size class and year, we rely on transition matrices accounting for the share of continuing firms that either moved to a higher size class (y^{+}_{cist}) or moved to a lower size class (y^{-}_{cist}) in each country-industry-size-class-year cell over three-year periods, defined as follows:

$$I^{+}_{ft} = \begin{cases} 1 \;\; if \; s_{ft+3} > s_{ft} \\ 0 \;\; otherwise \end{cases} \qquad\qquad I^{-}_{ft} = \begin{cases} 1 \;\; if \; s_{ft+3} < s_{ft} \\ 0 \;\; otherwise \end{cases}$$

[16] For more details on the dataset, see Di Mauro and Lopez-Garcia (2015) and https://www.comp-net.org/

[17] We combine the 4th and 5th vintage of CompNet's Labor Module datasets. We exclude Malta due to low number of observations, Austria and Germany because their sample is not representative and the Czech Republic and Lithuania because their shares of growing or shrinking firms are outliers. As a robustness check, we considered a sample with all countries except Malta and confirmed our main results for EPL. For the remaining countries in the CompNet dataset (Croatia and Romania), there are no data on EPL.

[18] More specifically, the 9 sectors covered are: manufacturing; construction; wholesale and retail trade; transportation and storage; accommodation and food services; information and communication; real estate activities; professional, scientific and technical activities; and administrative and support services.

[19] The number of firms in each country in the underlying dataset is reported in Table A1.

$$y^{+}_{cist} = \frac{\sum_{f \in cist} I^{g}_{ft}}{N_{cist}} \qquad\qquad y^{-}_{cist} = \frac{\sum_{f \in cist} I^{d}_{ft}}{N_{cist}}$$

where $I^{+/-}_{ft}$ is a binary indicator specifying whether firm *f* moved to a higher (+) or lower (-) size class (*s*) from year *t* to *t+3*. N_{cist} refers to the number of firms in each country-industry-size-class-year cell. y^{+}_{cist} is the share of firms in country *c* and industry *i* moving from size class *s* at time *t* to a higher size class at time *t+3*. Similarly, y^{-}_{cist} stands for the share of firms that move to a lower size class between *t* and *t+3*.[20] The share of firms remaining in the same size class, $y^{\sim}_{cist}$, is $y^{\sim}_{cist} = 1 - y^{+}_{cist} - y^{-}_{cist}$.

By registering only movements to higher or lower size classes, we ignore changes within a given size class. To the extent that the first two size classes are smaller than the remaining ones, we should notice in general more firm movement in and out of these two classes. In our analysis, we control for these differences by the means of fixed effects for each size class.

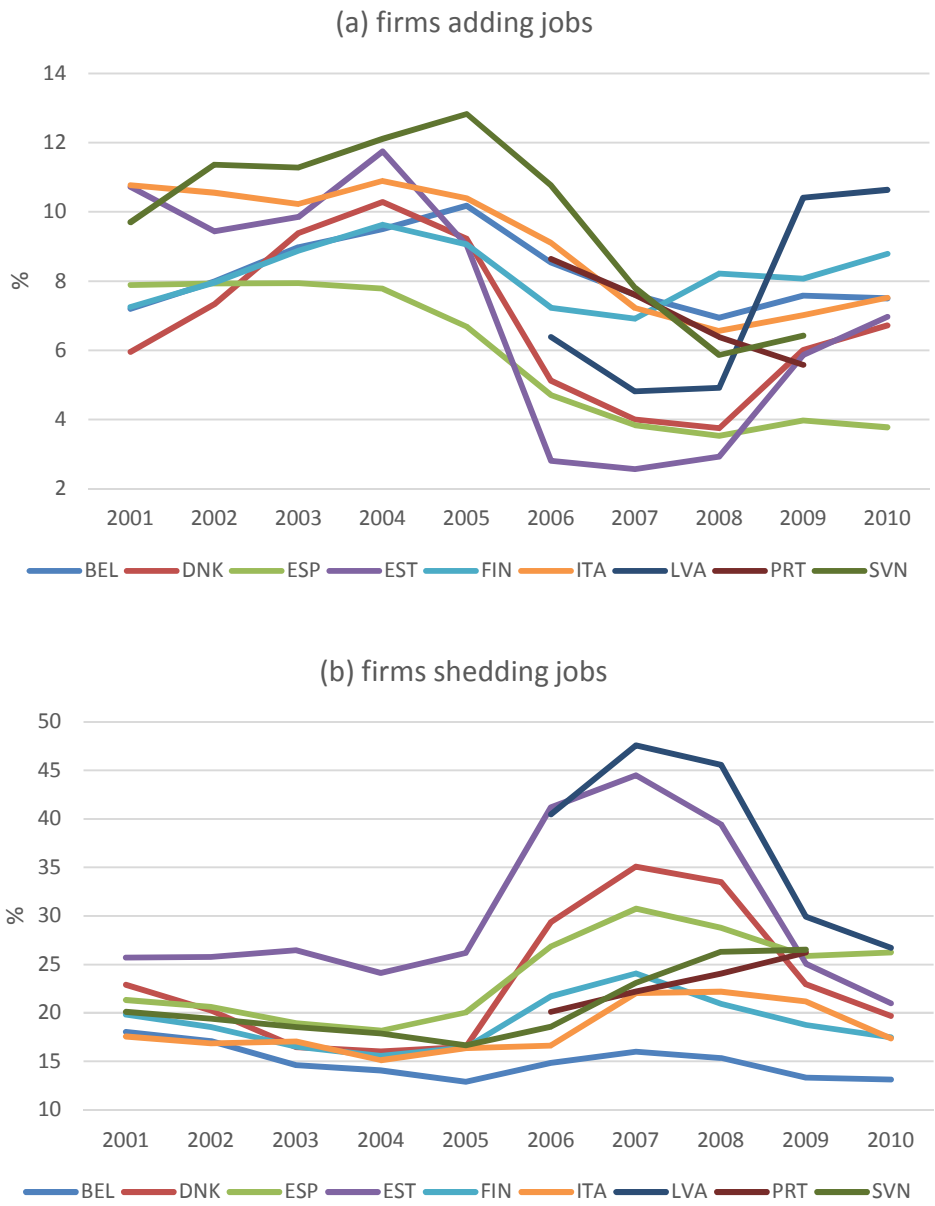
Graph 3 plots the share of firms adding and shedding jobs across countries over the sample period. In all countries, the share of firms adding jobs declined during the crisis, while the share of firms shedding jobs increased. In the pre-crisis period, firms were on average twice as likely to destroy jobs as to create them (Table A2 in Annex A). During the crisis, the ratio doubled with nearly four times more firms shedding jobs than creating them.

Graph 3 also suggests that the crisis was experienced differently across individual countries. Some countries show much smaller variation in the shares of firms adding or shedding jobs over the

[20] In what follows, we refer to these fractions simply as the share of firms adding and shedding jobs, respectively.

sample period (e.g. Belgium, Finland, Italy), while others experienced large swings during the crisis (e.g. Estonia, Denmark).

Graph 3 – Share of firms adding jobs y_{cist}^{+} and shedding jobs y_{cist}^{-}



Another firm-level variable that we take from the CompNet database is the share of credit-constrained firms, which we consider in the robustness checks below. The estimate reported in the CompNet dataset is described in Ferrando et al. (2015).

3.3.Corporate tax exemptions

As with size-related EPL exemptions, corporate income tax exemptions for small businesses can influence firm employment decisions. Indeed, these tax exemptions are common in many European countries. Firms below a threshold number of employees or level of turnover are subject to reduced tax rates on profits in Belgium, France, Latvia, Lithuania, Luxembourg, Netherlands, Portugal, and Spain. In Latvia, small firm exemptions also exist for payroll taxes. In Portugal, small firms benefit from a simplified tax regime as well as reduced rates. Table D1 in Appendix D provides an overview of specific rules that apply in each country over the reference period. Countries in our sample that are missing from the table have no size-related tax exemptions. The information is drawn from the OECD Tax Database (OECD 2018) and the PWC Worldwide Tax Summaries.[21]

In the robustness checks below, we add a dummy variable identifying where corporate tax exemptions are present in each country, year and size class. More precisely, to study the impact on firms' employment decisions, we define a dummy variable for corporate tax exemptions equal to one for the highest size class with an exemption in each country and year and zero otherwise.[22]

[21] A separate empirical literature attempts to calculate effective corporate tax rates by firm size class (e.g. European Commission 2002).

[22] As in the case of EPL, the prospect of higher taxes might discourage job creation among firms below the exemption threshold.

When tax exemptions relate to turnover rather than the number of employees, we use the average turnover in each size class from the CompNet dataset to determine whether the "average" firm in the given size class can benefit from the exemption. To our knowledge, this is the first attempt in the literature to evaluate the effects of corporate-tax exemptions in a multi-country setting.

4. Methodology

The structure of the CompNet dataset allows us to exploit both within-country variation in EPL (i.e. across size classes) and cross-country variation. First, we consider the impact of EPL exemptions on firm growth in the 10-19 employee size class since 20 employees is the most common threshold for EPL exemptions (see Annex C). Hence, we investigate whether countries with EPL exemptions for firm with less than 20 employees have a lower share of firms growing over the 20-employee threshold in country *c*, industry *i*, and initial year *t*, y_{cit}^{20E+}, relative to those growing over the 50-employee threshold in the same country, industry and year, y_{cit}^{50E+}. As discussed, the prospect of stricter regulation may discourage job creation among firms below the exemption threshold. The key variable of interest is a dummy equal to 1 if a country has an EPL exemption for firms with 10-19 employees in a particular year ($EPL20_{ct}$). The model includes country, sector and year fixed effects (δ_c, δ_i and δ_t, respectively). Formally, we estimate:

$$\frac{y_{cit}^{20E+}}{y_{cit}^{50E+}} = \beta_0 + \beta_1 EPL20_{ct} + \delta_c + \delta_i + \delta_t + \varepsilon_t, \quad (1)$$

To study the effect of the crisis, we interact the EPL exemption indicator with a crisis dummy equal to one from 2006 (i.e. for three-year windows starting from 2006).

$$\frac{y_{cit}^{20E+}}{y_{cit}^{50E+}} = \beta_0' + \beta_1' EPL20_{ct} + \beta_2'(crisis_t * EPL20_{ct}) + \delta_c' + \delta_i' + \delta_t' + \varepsilon_t', \quad (2)$$

Second, as a generalization of model (1), we pool together all size classes and run separate regressions for the share of firms from any size class that move to a higher size class, to a lower size class, or remain in the same size class over a three-year period. In this case, the dependent variable can take values between 0 and 1. To estimate a model with a proportion as a dependent variable, we apply the fractional logit model developed by Papke and Wooldridge (1996) accounting for the conditional expectation of the fractional response variable y_j: $E(y_j|x_j) = G(\boldsymbol{x}_j\phi)$, where $0 \leq y_j \leq 1$ denotes the dependent variable and $\boldsymbol{x_j}$ refers to the explanatory variables of observation j. G(z) is the logistic function $G(z) = \exp(z)/(1 + \exp(z))$, which maps z to the (0,1) interval. Papke and Wooldridge (1996) introduced a quasi-maximum likelihood estimator of model (2).[23]

Furthermore, in these regressions we consider both the original (continuous) EPL measure, as well as the EPL scaled by the share of permanent employees (EPL*), and our coverage-adjusted EPL measure (EPL**). Formally, we have:

$$E(y^+_{cist}) = G(\gamma_0^+ + \gamma_1^+ EPL_{ct} + \gamma_2^+ y^+_{EEist} + \gamma_c^+ + \gamma_i^+ + \gamma_s^+ + \gamma_t^+), \quad (3^+)$$

$$E(y^+_{cist}) = G(\gamma_0^{+*} + \gamma_1^{+*} EPL^*_{ct} + \gamma_2^{+*} y^+_{EEist} + \gamma_c^{+*} + \gamma_i^{+*} + \gamma_s^{+*} + \gamma_t^{+*}), \quad (3^{+}*)$$

$$E(y^+_{cist}) = G(\gamma_0^{+**} + \gamma_1^{+**} EPL^{**}_{cst} + \gamma_2^{+**} y^+_{EEist} + \gamma_c^{+**} + \gamma_i^{+**} + \gamma_s^{+**} + \gamma_t^{+**}), \quad (3^{+}**)$$

where $\gamma_c, \gamma_i, \gamma_s, \gamma_t$ refer to country, sector, size class and year fixed effects, respectively. We control for possible technology and market-driven factors influencing the share of growing firms by including the share of growing firms in the same sector and year in Estonia, y^+_{EEit} as a

[23] Papke and Wooldridge (2008) extend their fractional logit model to balanced panel data, however, our dataset is unbalanced.

benchmark. Estonia has few size-related exemptions and relatively low EPL values so it should provide a suitable benchmark.[24]

Running separate regressions for the share of firms adding jobs, the share of firms shedding jobs and the share of firms remaining in the same size class might clarify how employers perceive EPL. If EPL affects firms that add jobs more than it affects firms that shed jobs, this would suggest that employers perceive EPL as a tax on labour. If EPL affects firm shedding jobs more than firms adding jobs, then they may perceive EPL as an exit cost, as argued for example by Bentolila and Bertola (1990). We define equations (3^{-}) and ($3^{\sim}$), (3^{-}*) and ($3^{\sim}$*), and (3^{-}**) and ($3^{\sim}$**) as a corollary to equations (3^{+}), (3^{+}*) and (3^{+}**) replacing the share of firms adding jobs by the share of firms shedding jobs and the share of firms remaining in the same size class, respectively.

In addition, there is a strong theoretical justification for separately testing the impact of individual and collective dismissal rules. Individual dismissals tend to reflect disciplinary incidents and are possibly a-cyclical, whereas collective dismissals are more closely related to economic circumstances and should be relatively pro-cyclical (see Boeri and Jimeno, 2005). For example, in a severe crisis stringent rules on collective dismissal should have less effect on (large) firms shedding labour, because collective layoffs are unavoidable or because other factors or policies might compensate for the economic and social costs of massive layoffs (e.g. state aid for closure or short-time work).[25] Formally, we replace the composite EPL measures in equations (3^{+}), (3^{+}*) and (3^{+}**) by EPL subcomponents related to individual (ID) and collective (CD) dismissal provisions:

[24] The results are robust to using another country as a benchmark.

[25] This hypothesis is in line with findings in Gal et al. (2013) showing that during the recent crisis individual dismissal regulations had a stronger impact on employment than collective dismissal regulations.

$$E(y_{cist}^{+}) = G(\varphi_0^{+} + \varphi_1^{+} EPL_{ct}^{ID} + \varphi_2^{+} EPL_{ct}^{CD} + \varphi_3^{+} y_{EEist}^{+} + \varphi_c^{+} + \varphi_i^{+} + \varphi_s^{+} + \varphi_t^{+}), \quad (4^{+})$$

$$E(y_{cist}^{+}) = G(\varphi_0^{+*} + \varphi_1^{+*} EPL_{ct}^{ID*} + \varphi_2^{+*} EPL_{ct}^{CD*} + \varphi_3^{+*} y_{EEist}^{+} + \varphi_c^{+*} + \varphi_i^{+*} + \varphi_s^{+*} + \varphi_t^{+*}), \quad (4^{+}*)$$

$$E(y_{cist}^{+}) = G(\varphi_0^{+**} + \varphi_1^{+**} EPL_{cst}^{ID**} + \varphi_2^{+**} EPL_{cst}^{CD**} + \varphi_3^{+**} y_{EEist}^{+} + \varphi_c^{+**} + \varphi_i^{+**} + \varphi_s^{+**} + \varphi_t^{+**}). \quad (4^{+}**)$$

Finally, we also modify equations (3^{+}**) and (4^{+}**) by including interactions with the crisis dummy defined above in equation (2) to test whether the effect of the coverage-adjusted EPL changed during the crisis. While EPL might lower job creation in normal times, it might also limit the extent of job destruction during recessions (Messina and Vallanti, 2007). Formally, we have:

$$E(y_{cist}^{+}) = G(\theta_0^{+**} + \theta_1^{+**} EPL_{cst}^{**} + \theta_2^{+**}(crisis_t * EPL_{cst}^{**}) + \theta_3^{+**} y_{EEist}^{+} + \theta_c^{+**} + \theta_i^{+**} + \theta_s^{+**} + \\ + \theta_t^{+**}), \quad (5^{+**})$$

$$E(y_{cist}^{+}) = G(\psi_0^{+**} + \psi_1^{+**} EPL_{cst}^{ID**} + \psi_2^{+**}(crisis_t * EPL_{cst}^{ID**}) + \psi_3^{+**} EPL_{cst}^{CD**} + \\ + \psi_4^{+**}(crisis_t * EPL_{cst}^{CD**}) + \psi_5^{+**} y_{EEist}^{+} + \psi_c^{+**} + \psi_i^{+**} + \psi_s^{+**} + \psi_t^{+**}). \quad (6^{+**})$$

5. Results

First, we investigate the impact of exemptions to EPL rules at the most common 20-employee threshold.

Table 1 – OLS estimates of models (1) and (2)

	Relative fraction of firms growing over 20E threshold $y_{cit}^{20E+}/y_{cit}^{50E+}$	
Variables/ Model	(1)	(2)
$EPL20_{ct}$	-0.12+	-0.18*
	(0.068)	(0.083)
$Crisis_t$ * $EPL20_{ct}$		0.11
		(0.074)
Constant	2.49**	2.50**
	(0.094)	(0.095)
Country, Sector and Year FEs	YES	YES
R-squared	0.71	0.71
Observations	697	697

Notes: Standard errors in parentheses clustered by country and sector. Results weighted by the number of firms in the sample.
** p<0.01, * p<0.05, + p<0.1.

Table 1 shows that countries with an EPL exemption for firms with 10-19 employees have a significantly lower share of firms growing over the 20-employee threshold relative to the share of firms growing over the 50-employee threshold in the same industry and year. This suggests that the prospect of stricter regulation may discourage firms below the exemption threshold from growing over the threshold. In model (2), the impact of EPL was not significantly different during the crisis.

Next, we pool all size classes and run separate regressions for the share of firms adding jobs, the share of firms shedding jobs, and the share of firms remaining in the same size class. These regressions include three different versions of the continuous EPL variable as an explanatory variable. Table 2 reports estimates of all the variants of models (3^+) and (4^+) with the share of growing firms as the dependent variable. The table reports marginal effects, i.e. $\partial E(y|x)/\partial x_i$.

Table 2 – Fractional logit estimates for firms adding jobs, marginal effects

	Share of firms moving to a higher size class: y^+_{cist}					
	Original EPL		EPL*		EPL**	
Variables/ Model	(3^+)	(4^+)	(3^+*)	(4^+*)	(3^+**)	(4^+**)
EPL: composite ID + CD	0.00		-0.01		-0.02**	
	(0.007)		(0.010)		(0.004)	
EPL^{ID}: individual dismissals		0.00		-0.01		-0.01**
		(0.004)		(0.007)		(0.004)
EPL^{CD}: collective dismissals		-0.00		-0.01		-0.01**
		(0.003)		(0.004)		(0.002)
y^+_{EEist}	0.05	0.05	0.05	0.05	0.04	0.04
	(0.032)	(0.032)	(0.032)	(0.032)	(0.029)	(0.029)
Country, Sector, Size Class and Year FEs	YES	YES	YES	YES	YES	YES
Observations	1,963	1,963	1,963	1,963	1,963	1,963

Notes: EPL* is the OECD measure scaled by the share of permanent employees and EPL** is the adjusted EPL (both scaled by the share of permanent employees and adjusted for size-related EPL exemptions). Standard errors in parentheses clustered by country, sector and size class. Results weighted by the number of firms in the sample. ** p<0.01, * p<0.05, + p<0.1.

The main result is that stricter EPL lowers the share of firms that move to a larger size class. However, this is only true if one adjusts for coverage. In models (3^{+}) and (4^{+}), the original EPL series published by the OECD are not significant (both for the composite indicator in model (3^{+}) and splitting into individual and collective dismissal regulations in model (4^{+})). This result is unchanged in models (3^{+}*) and (4^{+}*) when the EPL indicators are scaled by the share of workers with permanent contracts. This suggests that the OECD indicators may lack the necessary level of detail that might explain some of the conflicting results from the empirical literature.

In models (3^{+}**) and (4^{+}**), once we switch to EPL measures that are adjusted for coverage their effects become significant. All else equal, a one-unit increase in the composite adjusted EPL (model (3^{+}**)) lowers the share of growing firms by 2 percentage points. In addition, both individual and collective dismissal regulations (model (4^{+}**)) have a significant negative impact of similar size.

Table 3 – Fractional logit estimates for firms remaining in the same size class, marginal effects

	Share of firms remaining in the same size class: $\tilde{y_{cist}}$					
	Original EPL		EPL*		EPL**	
Variables/ Model	(3˜)	(4˜)	(3˜*)	(4˜*)	(3˜**)	(4˜**)
EPL: composite ID + CD	-0.00		-0.01		0.05**	
	(0.014)		(0.022)		(0.005)	
EPL^{ID}: individual dismissals		-0.01		-0.01		0.03**
		(0.006)		(0.015)		(0.006)
EPL^{CD}: collective dismissals		0.00		0.00		0.02**
		(0.007)		(0.008)		(0.003)
$\tilde{y_{EEist}}$	0.29**	0.29**	0.29**	0.29**	0.29**	0.29**
	(0.047)	(0.047)	(0.047)	(0.047)	(0.035)	(0.035)
Country, Sector, Size Class and Year FEs	YES	YES	YES	YES	YES	YES
Observations	1,963	1,963	1,963	1,963	1,963	1,963

Notes: EPL* is the OECD measure scaled by the share of permanent employees and EPL** is the adjusted EPL (both scaled by the share of permanent employees and adjusted for size-related EPL exemptions). Standard errors in parentheses clustered by country, sector and size class. Results weighted by the number of firms in the sample. ** p<0.01, * p<0.05, + p<0.1.

In Table 3 the dependent variable is the share of firms remaining in the same size class over a three-year period, respectively. Again, adjusting for coverage leads to significant EPL effects, increasing the share of firms remaining in the same size class (models (3˜**) and (4˜**)). This suggests that EPL discourages firms from growing to a higher size class, providing an incentive to remain below the exemption threshold.

In Table 4 the dependent variable is the share of firms moving to a lower size class. Here the effect of coverage-adjusted EPL is insignificant (model (3-**)).[26] Our result that EPL has stronger impact on firms adding jobs than on firms shedding jobs suggests that employers perceive stringent EPL as a tax on labour rather than as an exit cost.

[26] The significant coefficients for individual and collective dismissal regulation in column (4-**) of Table 4 are not robust to changes in the baseline specification, see section 5.1.

Table 4 – Fractional logit estimates for firms shedding jobs, marginal effects

	Share of firms moving to a lower size class: $\bar{y}_{cist}$					
	Original EPL		EPL*		EPL**	
Variables/ Model	(3^{-})	(4^{-})	(3^{-*})	(4^{-*})	(3^{-**})	(4^{-**})
EPL: composite ID + CD	0.01		0.04+		-0.01	
	(0.020)		(0.024)		(0.010)	
EPL^{ID}: individual dismissals		0.03*		0.05**		0.04*
		(0.011)		(0.016)		(0.014)
EPL^{CD}: collective dismissals		-0.02*		-0.00		-0.01*
		(0.008)		(0.010)		(0.003)
$\bar{y}_{EEist}$	0.20**	0.20**	0.20**	0.20**	0.20**	0.20**
	(0.057)	(0.058)	(0.055)	(0.056)	(0.057)	(0.055)
Country, Sector, Size Class and Year FEs	YES	YES	YES	YES	YES	YES
Observations	1,352	1,352	1,352	1,352	1,352	1,352

Notes: EPL* is the OECD measure scaled by the share of permanent employees and EPL** is the adjusted EPL (both scaled by the share of permanent employees and adjusted for size-related EPL exemptions). Standard errors in parentheses clustered by country, sector and size class. Results weighted by the number of firms in the sample. ** p<0.01, * p<0.05, + p<0.1.

In Table 5 we report estimates of models (5^{+**}) and (6^{+**}), which include an interaction term multiplying the adjusted EPL measures by a crisis dummy. For the share of firms adding jobs, the effect of the composite EPL measure did not change significantly during the crisis. However, regulation on individual dismissals had a significantly smaller negative effect during the crisis, while regulation on collective dismissals had significantly larger negative impact. This could reflect the higher probability of collective lay-offs and awareness of their costs during the crisis. One could also argue that following a large negative shock firms are less concerned about individual (disciplinary) dismissals.

For the share of firms shedding jobs, the effects of adjusted EPL (including its subcomponents) were not statistically different during the crisis period. Unlike Messina and Vallanti (2007), who claim that EPL limits job destruction in bad times, we do not find significantly different effects during the crisis. Hence, our results suggest that stricter EPL only has negative effects on

continuing firms: it lowered the share of firms that add jobs both before and during the crisis and it did not reduce the share of firms that shed jobs during the crisis.

Table 5 – Effects of adjusted EPL before and during the crisis, marginal effects

	Firms adding jobs			*Firms shedding jobs*		
	pre-crisis	crisis	t-test {p-val}	pre-crisis	crisis	t-test {p-val}
	model (5^{+}**)			model (5^{-}**)		
EPL: composite ID + CD	-0.022**	-0.021**	0.22	-0.002	-0.013	1.55
	(.004)	(.004)	{.64}	(.011)	(.01)	{.21}
	model (6^{+}**)			model (6^{-}**)		
EPL^{ID}: individual dismissals	-0.032**	-0.011**	37.72	0.036+	0.027*	0.14
	(.004)	(.004)	{0.0}	(.019)	(.012)	{.70}
EPL^{CD}: collective dismissals	0.002	-0.012**	37.39	-0.005	-0.007+	0.13
	(.002)	(.003)	{0.0}	(.006)	(.004)	{.72}

Note: Only key variables shown. Reported are marginal effects $\partial E(y \mid x, crisis=0)/\partial x_i$ and $\partial E(y \mid x, crisis=1)/\partial x_i$. Standard errors in parentheses clustered by country, sector and size class. Results weighted by the number of firms in the sample. T-test for the equality of marginal effects. ** p<0.01, * p<0.05, + p<0.1.

5.1. Robustness checks

We considered a battery of tests to confirm that our results are robust. We extend models (2), (3) and (4) to control for factors and policies that might also affect firm employment decisions. More specifically, we consider corporate tax exemptions (CT_{cst}), the share of credit-constrained firms (CC_{cist}) and a business cycle indicator (lagged real value added growth, RVA_{cist-1}).

Table B1 in Annex B reports estimates of model (2) expanded to include the relative share of credit-constrained firms and lagged real value added growth.[27] Both additional variables are insignificant and EPL still has a negative impact on firm growth, as in the baseline model.

[27] We do not include corporate tax exemptions dummy as there is no country in our sample in which firms with less than 20 employees would be exempted while firms with 20-49 employees would not be exempted.

Compared to Tables 2-4, the expanded models (3^{+}**), (4^{+}**), ($3^{\sim}$**), ($4^{\sim}$**), (3^{-}**), and (4^{-}**) in Table 6 suggest that the inclusion of additional control variables has very little impact on the estimated effects of EPL. As with the size-related exemptions to EPL, corporate tax exemptions have a significant negative effect on firm growth. All else equal, the share of firms adding jobs is 3 percentage points lower in the highest size classes that can benefit from corporate tax exemptions. Furthermore, the effect of lagged value added growth also corresponds to our expectations. Higher lagged growth significantly increases the share of firms adding jobs and decreases the share of firms shedding jobs. Finally, we find no significant impact of the estimated share of credit-constrained firms after accounting for all the other factors.[28]

[28] The share of credit-constrained firms and the shares of firms adding or shedding jobs are all negatively correlated with firm size, complicating the analysis. Since the share of credit-constrained firms is only a control variable in this section, we are less concerned about identifying this particular parameter. In Table 6 we interact the share of credit-constrained firms with the size class dummy.

Table 6 – Fractional logit estimates with additional control variables, adjusted EPL, marginal effects

	Share of firms adding jobs		Share of firms remaining in same size class		Share of firms shedding jobs	
Variables/ Expanded model	$(3^{+}**)'$	$(4^{+}**)'$	$(3^{\sim}**)'$	$(4^{\sim}**)'$	$(3^{-}**)'$	$(4^{-}**)'$
EPL**: composite ID + CD	-0.02**		0.07**		0.01	
	(0.003)		(0.007)		(0.011)	
EPL^{ID**}: individual dismissals		-0.01**		0.02**		0.05**
		(0.003)		(0.006)		(0.010)
EPL^{CD**}: collective dismissals		-0.01**		0.03**		-0.01**
		(0.002)		(0.004)		(0.003)
CT_{cst}: Corp. tax exemption dummy	-0.02*	-0.02*	-0.00	-0.01	0.01	0.01
	(0.009)	(0.009)	(0.015)	(0.012)	(0.012)	(0.012)
CC_{cist}: Share of credit-constr. firms	0.04	0.04	-0.11	-0.17*	-0.00	0.04
	(0.061)	(0.060)	(0.100)	(0.074)	(0.104)	(0.102)
RVA_{cist-1}: Lagged real value added growth	0.06**	0.06**	-0.00	0.00	-0.17**	-0.19**
	(0.014)	(0.014)	(0.038)	(0.035)	(0.036)	(0.034)
$y_{EEist}^{+/\sim/-}$	-0.01	-0.00	0.24**	0.22**	0.14**	0.14**
	(0.027)	(0.026)	(0.039)	(0.039)	(0.045)	(0.044)
Country, Sector, Size Class and Year FEs	YES	YES	YES	YES	YES	YES
Observations	1,002	1,002	1,002	1,002	687	687

Notes: Standard errors in parentheses clustered by country, sector and size class. Results weighted by the number of firms in the sample. ** p<0.01, * p<0.05, + p<0.1.

Furthermore, we consider replacing the additive fixed effects in the baseline specification of models (3) and (4) including adjusted EPL measures with the following interactions (each in a separate regression): (i) country × year; (ii) sector × size class; (iii) country × year and sector × size class; and (iv) country × year, sector × year and sector × size class fixed effects. In all models for firms adding jobs and for firms remaining in the same size class, the difference in the estimated EPL effects is very small (smaller than 0.01) and coefficients remain significant. For firms shedding jobs, the effects of individual and/or collective EPL are no longer significant for some specifications.

As additional checks, we consider including all countries covered by CompNet (i.e. adding Austria, Germany, the Czech Republic and Lithuania) despite possible data issues. We also test

the sensitivity of our estimates to changing the benchmark country (Estonia in the baseline) and finally we estimate models (3) and (4) including adjusted EPL measures using OLS instead of the fractional logit. In all cases, estimated effects are very similar and statistically significant. The results still show that the estimated effects of individual and/or collective EPL on the share of firms shedding jobs are not robust.[29]

Finally, we replicate the results Haltiwanger et al. (2014) find for continuing firms. These authors first purge their data for time variation by taking sample averages and then estimate a model explaining job reallocation (sum of job creation and destruction) for each country, sector and size class as a function of an interaction term between the US reallocation rate and country specific EPL, as well as country and industry × size fixed effects. Instead of using the sum of job creation and job destruction, we sum the share of firms adding and shedding jobs in each sector, size class and country. Despite this difference, as well as differences in countries and years, different EPL measures and a different baseline country, we obtain quantitatively similar results. The coefficient reported by Haltiwanger et al. (2014) in the job reallocation equation is -0.051 (Table 6 in their paper), while our coefficient is -0.036 (both significant at 10% significance level).

6. Conclusions

This paper assesses the impact of EPL on firm-level job creation and job destruction in Europe over 2001-2013. We develop a novel coverage-adjusted EPL indicator that accounts for EPL exemptions related to firm size. Originally, we do not simply adjust the OECD indicator for the share of exempted firms but account for exemptions from each component of the EPL index. It

[29] Results for all alternative specifications discussed in this section are available from the authors on request.

turns out that adjustment for coverage is crucial in the estimation of the effect of EPL. In particular, the effects of EPL on the share of firms adding jobs become significant with a negative sign. This could help explain some of the inconclusive results obtained in the literature studying EPL exemptions based on firm size.

We find that firms below EPL exemption thresholds were discouraged from adding jobs, arguably to avoid stricter regulation. This suggests that firms feared the costs of shedding jobs during recessions, and as a result, the share of firms remaining in the same size class increased. At the same time, we do not find evidence that EPL limited firms shedding jobs after adverse shocks. Estimates remain largely unchanged when accounting for the share of credit-constrained firms and for the position in the business cycle. We also find that corporate tax exemptions related to firm size significantly discouraged firms from adding jobs, in addition to the effect from EPL rules. Finally, the Great Recession did not significantly change the impact of the composite EPL indicator.

In future work, we plan to re-evaluate the impact of EPL on key firm-level variables, such as investment, and macroeconomic outcomes, such as unemployment, using the adjusted measure that we developed. We will also consider the effect of other policies, which might compensate for EPL rigidities, such as state aid or short-time work. As our dataset covers only continuing firms, we leave it for future research to analyse the effect of the adjusted EPL on job creation and destruction through firm entry or exit.

References

Aleksynska, M. and Eberlein, F. (2016), “Coverage of employment protection legislation (EPL)”, International Labour Organization Working Papers.

Autor, D. H., W. R. Kerr and A. D. Kugler (2007), “Do Employment Protections Reduce Productivity? Evidence from U.S. States”, in: *The Economic Journal*, 117, 189.

Bassanini, A. and A. Garnero (2013), “Dismissal protection and worker flows in OECD countries: Evidence from cross-country/cross-industry data”, in: Labour Economics, 21(C), 25-41.

Bassanini A., A. Garnero, P. Marianna and S. Martin (2010), “Institutional Determinants of Worker Flows: A Cross-Country/Cross-Industry Approach”, OECD Social, Employment and Migration Working Papers, No. 107, OECD.

Bauer, T., S. Bender and H. Bonin (2007), “Dismissal Protection and Worker Flows in Small Establishments”, in: *Economica*, 74(296), 804-821.

Bentolila, S., and G. Bertola (1990), “Firing costs and labor demand: How bad is eurosclerosis?”, in: *Review of Economic Studies*, 57, 381–402.

Bertola, G. (1990) “Job Security, Employment, and Wages”, in: *European Economic Review*, 54(4), 851-79.

Boeri, T. and J. F. Jimeno (2005), “The effects of employment protection: Learning from variable enforcement”, in: *European Economic Review*, 49(8), 2057-2077.

Botero, J, S. Djankov, R. La Porta, F. Lopez-de-Silanes, and A. Shleifer (2004), “The Regulation of Labour”, in: *Quarterly Journal of Economics*, 119(4), 1339-1382.

Bottasso, A., M. Conti and G. Sulis (2017), "Firm dynamics and employment protection: Evidence from sectoral data," in: *Labour Economics*, 48(C), 35-53.

Cingano, F., M. Leonardi, J. Messina and G. Pica (2010), “The effects of employment protection legislation and financial market imperfections on investment: evidence from a firm-level panel of EU countries”, in: *Economic Policy*, 25, 117-163.

Dharmapala, D. Slemrod, J. and Wilson, J. D. (2011), “Tax policy and the missing middle: Optimal tax remittance with firm-level administrative costs,” in: *Journal of Public Economics*, 95(9-10), 1036-1047.

Di Mauro, F. and P. Lopez-Garcia (2015), “Assessing European competitiveness: the new CompNet microbased database”, ECB Working Paper 1764.

European Commission (2002), “Sector and size effects on effective corporate taxation”, European Economy 175, Brussels.

Ferrando, A., C. Altomonte, S. Blank, P. Meinen, M. Iudice, M. Felt, K. Neugebauer and I. Siedschlag (2015), “Assessing the financial and financing conditions of firms in Europe: the financial module in CompNet”, ECB Working Paper Series 1836.

Gal, P., A. Hijzen and Z. Wolf (2013), “The Role of Institutions and Firm Heterogeneity for Labour Market Adjustment: Cross-Country Firm-Level Evidence”, IZA Discussion Paper 7404.

Garibaldi, P., L. Pacelli and A. Borgarello (2004). "Employment protection legislation and the size of firms" *Giornale Degli Economisti E Annali Di Economia*, 63/1, 33-68.

Haltiwanger J., S. Scarpetta and H. Schweiger (2014), “Cross country differences in job reallocation: The role of industry, firm size and regulations”, in: *Labour Economics*, 26, 11-25.

Hijzen, A., L. Mondauto, and S. Scarpetta (2017), “The impact of employment protection on temporary employment: evidence from a regression discontinuity design”, in: *Labour*

*Economics,*46(C), 64-76.

IMF (2016), "Time for a supply-side boost? Macroeconomic effects of labour and product market reforms in advanced economies", in: World Economic Outlook: too slow for too long, IMF.

International Labour Organization (2015), "Employment Protection Legislation: Summary Indicators in the Area of Terminating Regular Contracts (Individual Dismissals)", Geneva.

Kugler, A.D. and G. Pica (2008), "Effects of employment protection on worker and job flows: evidence from the 1990 Italian reform", in: *Labour Economics*, 15(1), 78-95.

Laeven, L., P. McAdam and A. Popov (2018), "Credit shocks, employment protection and growth: firm-level evidence from Spain", ECB Working Paper 2166.

Messina, J. and G. Vallanti (2007), "Job flows dynamics and firing restrictions: evidence from Europe", in: *Economic Journal*, 117, 279-301.

Micco A. and C. Pagés (2006), "The economic effects of employment protection: evidence from international industry-level data", IZA Discussion Paper 2433.

Martins, P. (2009), "Dismissals for Cause: The Difference That Just Eight Paragraphs Can Make", in: *Journal of Labor Economics,* 27(2), 257-279.

Moscarini G. and F. Postel-Vinay (2012), "The Contribution of Large and Small Employers to Job Creation in Times of High and Low Unemployment", in: *American Economic Review*, 102(6), 2509-2539.

Muravyev, A. (2014), "The Evolution of the Regulation of Labour in the USSR, the CIS and the Baltic States, 1985–2009", in: *Europe-Asia Studies*, 66(8), 1270-1294.

OECD (2018), "OECD Tax Database. Explanatory Annex. Part II: Taxation of Corporate and Capital Income", Paris.

OECD (2013), “Protecting jobs, enhancing flexibility: a new look at employment protection legislation”, in: *OECD Employment Outlook 2013*.

Papke, L. and J. Wooldridge (1996), “Econometric Methods for Fractional Response Variables with an Application to 401(K) Plan Participation Rates”, in: *Journal of Applied Econometrics*, 11(6), 619-32.

Papke, L. and J. Wooldridge (2008), “Panel data methods for fractional response variables with an application to test pass rates”, in *Journal of Econometrics*, 145(1-2), 121-133.

Pissarides, C. (2010), “Why Do Firms Offer 'Employment Protection'?” in *Economica*, 77(308), 613-636.

Schivardi F. and R. Torrini (2008), “Identifying the effects of firing restrictions through size-contingent differences in regulation", in: *Labour Economics*, 15(3), 482-511.

Venn, D. (2009), “Legislation, Collective Bargaining and Enforcement: Updating the OECD Employment Protection Indicators”, OECD Social, Employment and Migration Working Papers 89.

Annex A – Descriptive statistics

Table A1 – Number of firms covered, 2001-2013

	Size class (number of employees)					
Country	1-9	10-19	20-49	50-249	≥250	Total
Belgium	670597	86656	64140	27083	5806	854282
Croatia	244270	33758	19308	10424	2376	310136
Estonia	126736	21103	13694	6422	301	168256
Finland	605320	56954	35565	16201	3871	717911
Italy	1378920	492042	283807	125829	19523	2300121
Lithuania	125031	36897	26604	15887	1913	206332
Portugal	562583	77570	41653	17468	2537	701811
Romania	1166716	128798	84715	48491	9403	1438123
Slovenia	175227	20215	12333	8232	1514	217521
Spain	2241049	400143	228146	62941	8121	2940400

Table A2: Growing and downsizing firms, 2001-2013, percent

Variable	Period	Obs.	Mean	Std. Dev.	Min	Max
y^{+}_{cist}	Pre-crisis	1,141	9.3	6.8	0	31.5
	Crisis	1,413	6.4	5.6	0	29.1
y^{-}_{cist}	Pre-crisis	927	18.5	8.1	0	60.5
	Crisis	1,179	25.1	12.9	0	77.6

Note: Observations refer to country-sector-size class and year combinations. Crisis period includes three-year windows starting in 2006.

Annex B – Robustness

Table B1 – OLS estimates of model (2) with additional control variables

Variables	Relative fraction of firms growing over 20E threshold $y_{cit}^{20E+}/y_{cit}^{50E+}$
$EPL20_{ct}$	-0.30*
	(0.146)
$Crisis_t$ * $EPL20_{ct}$	0.22**
	(0.082)
Relative share of credit-constr. firms	-0.03
	(0.017)
Lagged real value added growth	0.29
	(0.288)
Constant	2.58**
	(0.088)
Country, Sector and Year FEs	YES
R-squared	0.75
Observations	242

Notes: Standard errors in parentheses clustered by country and sector. Results weighted by the number of firms in the sample. ** p<0.01, * p<0.05, + p<0.1.

Annex C – Employment Protection Legislation

Table C1 – Information on the OECD's methodology for EPL coding and ensuing comments

	OECD methodology	Comments (general)	Comments (small-size exemptions)
Procedural inconvenience (1/3)			
Notification procedures	0 - when an oral statement is enough 1 - when a written statement of the reasons for dismissal must be supplied to the employee 2 - when a third party (such as work councils or the competent labour authority) must be notified 3 – when the employer cannot proceed to dismissal without authorization from a third party	The sub-index captures the stringency of notification procedures.	Notification procedures for smaller firms are either not specified (AUT, DEU, ITA) or softer than those foreseen by the general contractual regime (FIN, PRT). Where relevant, these aspects are reflected in the re-coding exercise.
Delay involved before notice can start	0, 1, 2, 3, 5, or 6 depending on the number of days of delay	The sub-index captures the expected size of delays involved.	Additional delays for smaller firms are either not specified (AUT, DEU) or fewer than those foreseen by the general contractual regime (FIN, ITA, PRT).
Notice and severance pay for no-fault individual dismissal (1/3)			
Length of notice period at 9 months tenure Length of notice period at 4 years tenure Length of notice period at 20 years tenure	0, 1, 2, 3, 4, 5, 6 depending on the months of notice	The sub-index captures notice periods for dismissals with a valid reason. Some countries do not have statutory rules for notice period but such rules are provided via collective agreements (ITA). Some other countries foresee pay in lieu of notice.	Smaller firms may not be subject to statutory rules for notice period (PRT) or may be subject to a shorter notice period (SVN). Where relevant, all of these aspects are reflected in the re-coding exercise.
Severance pay at 9 months tenure Severance pay at 4 years tenure Severance pay at 20 years tenure	0, 1, 2, 3, 4, 5, 6 depending on months' pay	The sub-index captures severance pay for dismissals with a valid reason. Some countries do not have statutory rules for severance pay but such rules are provided via collective agreements (ITA).	Smaller firms may not be subject to statutory rules for severance pay (DEU, PRT) or part of the indemnity arises from sources other than the employer (ESP) or, in the absence of statutory rules, small firms may benefit from softer de facto regimes than it is practice for long tenures within larger firms (FIN). Where relevant, all of

			these aspects are reflected in re-coding exercise.
Difficulty of dismissal (1/3)			
Definition of unjustified or unfair dismissal	0 - when worker capability or redundancy of the job are adequate and sufficient grounds for dismissal	The sub-index captures the stringency of regulation based on valid grounds for dismissal in light of prohibited grounds. So, for example, values are the lowest when worker capability and economic reasons are sufficient grounds for dismissal and highest when worker capability is per se no sufficient ground. Some countries have an explicit definition in the legislation; some others leave it to third parties to verify whether the reasons for dismissal are valid.	Smaller firms may either not be subject to specific regulation (ITA) or, even if normally exempted, would nonetheless benefit from some protection to the benefit of employees that are unfairly dismissed (HRV, PRT) that may in some cases be vary also depending on the age of the worker involved (AUT). Where relevant, this aspect is reflected in the re-coding exercise.
	1 - when social considerations, age or job tenure must when possible influence the choice of which worker(s) to dismiss		
	2 - when a transfer and/or a retraining to adapt the worker to different work must be attempted prior to dismissal		
	3 when worker capability cannot be ground for dismissal		
Length of trial period	0, 1, 2, 3, 4, 5, 6 depending on the months of trial period (during which workers are not fully covered by employment protection legislation)	The sub-index captures the maximum duration of the trial period but does not reflect the fact that, in some countries, some protection against dismissal is still offered during the trial period as concerns, for example, valid grounds for dismissal and/or notification procedures (PRT, ROM).	Smaller firms may enjoy longer trial periods under which workers are either not covered by employment protection legislation (ESP) or indeed under softer rules (PRT). Where relevant, this aspect is reflected in the re-coding exercise.
Compensation following unfair dismissal	0, 1, 2, 3, 4, 5, 6 depending on months' pay	The sub-index captures compensations beyond ordinary severance pay.	
Possibility of reinstatement following unfair dismissal	0 – no right or practice of reinstatement	The sub-index captures the likelihood of reinstatement.	Smaller firms may be exempted from mandatory reinstatement in the case of unfair dismissal by either paying compensation or by obtaining freedom to choose between compensation and reinstatement.
	1 – reinstatement rarely or sometimes made available		
	2 - reinstatement fairly often made available		
	3 - reinstatement (almost) always made available		
Maximum time to make a claim of unfair dismissal	0, 1, 2, 3, 4, 5, 6 depending on months of maximum time period	The sub-index relates to the maximum time period for filing an unfair dismissal complaint from the effective date of dismissal.	

Collective dismissals			
Definition of collective dismissals	0 - if there is no additional regulation for collective dismissals	The sub-index relates to the lowest threshold. In doing so, though, it does not account for the fact that the lowest threshold might be not be constraining at all for large firms nor does it account for the fact that, in some countries, the definition of collective dismissal varies by size class such that the lowest threshold is not necessarily representative of the real stringency of the regime.	In some countries, the number of workers that needs be involved is fixed independently of firms' initial size. In other countries, the number of workers involved varies with size class (EST, LVA, PRT, ESP). Where relevant, these aspects are reflected in the re-coding exercise.
	1 - if specific regulations apply from 50 dismissals upward		
	2 - if specific regulations apply from 20 dismissals onward		
	3 - if specific regulations apply at 20 dismissals		
	4 - if specific regulations start to apply at below 10 dismissals		
Additional notification requirements in case of collective dismissals	0 - no additional requirement	The sub-index refers to notification requirements additional to those for individual dismissals which would apply though only to firms whose number of employees is equal or greater than the definition of collective dismissal. Where relevant, this aspect is reflected in the coding exercise.	
	1 – when one more actor needs to be notified		
	2- when two more actors need to be notified		
Additional delays involved in case of collective dismissals	0, 1, 2, 3, 4, 5, 6 depending on the number of days of delay	The sub-index refers to delays additional to those for individual dismissals which would apply though only to firms whose number of employees is equal or greater than the definition of collective dismissal. Where relevant, this aspect is reflected in the coding exercise.	
Other special costs to employers in case of collective dismissals	0 - no additional requirements	The sub-index refers to special costs to employers additional to those for individual dismissals which would apply though only to firms whose number of employees is equal or greater than the definition of collective dismissal. Where relevant, this aspect is reflected in the coding exercise.	
	1 – additional severance pay or social compensation plans required		
	2 – additional severance pay and social compensation plans required		

Table C2: Size-contingent employment protection for regular contracts including additional provision for collective dismissal

	Level 4	Austria	Belgium	Croatia	Czech Republic	Denmark	Estonia	Finland
1	Notification procedures	**Only firms > 5 employees**[30]	All firms	All firms	All firms	All firms	All firms	**Only firms > 20 employees**[31]
2	Delay involved before notice can start	**Only firms > 5 employees**[32]	All firms	All firms	All firms	All firms	All firms	**Only firms > 20 employees**[33]
3	Length of the notice period at 9 months tenure	All firms	All firms	All firms	All firms	All firms	All firms	All firms
	Length of the notice period at 4 years tenure	All firms	All firms	All firms	All firms	All firms	All firms	All firms
	Length of the notice period at 20 years tenure	All firms	All firms	All firms	All firms	All firms	All firms	All firms
4	Severance pay at 9 months tenure	All firms	All firms	All firms	All firms	All firms	All firms	All firms
	Severance pay at 4 years tenure	All firms	All firms	All firms	All firms	All firms	All firms	All firms
	Severance pay at 20 years tenure	All firms	All firms	All firms	All firms	All firms	All firms	**Only firms > 30 employees**[34]

[30] For Austrian firms with less than 5 employees there are no specific notification requirements. For these firms (and up until 9 employees), the sub-index is re-coded as 0.

[31] When dismissal is based on personal reasons, notification requirements are the same across all Finnish firms. When dismissal is motivated by lack of work, notification requirements are softer for firms with less than 20 employees, where only the employment office shall be notified (rather than the employment office plus trade union representatives) and where no consultation with unions on reasons and ways to avoid lay-off is required. For these firms, the sub-index is revised downwards to 1.5 to capture average stringency of regulation across dismissal for both personal and economic reasons.

[32] For Austrian firms with less than 5 employees there are no additional delays. For these firms (and up until 9 employees), the sub-index is re-coded as 0.

[33] When dismissal is based on personal reasons, additional delays are the same across all Finnish firms. When dismissal is motivated by lack of work, there are fewer additional delays for firms with less than 20 employees. For these firms, the sub-index is revised downwards to 1 to capture average stringency of regulation across dismissal for both personal and economic reasons.

[34] Finnish firms are not subject to statutory rules for severance pay. Firms with more than 30 employees are but under the obligation of providing free vocational coaching or training courses to workers that have been with the firm for at least 5 years when dismissal is based on economic reasons. This entitlement can be waived by collective agreement. For these firms (from 20 employees to over 250), the sub-index is revised upwards to 1 under the assumption that such courses would not cost more than 3 months of salary.

5	Definition of unjustified or unfair dismissal	**Only firms > 5 employees**[35]	All firms	**Only firms > 20 employees**[36]	All firms	All firms	All firms	All firms
6	Length of trial period	All firms	All firms	All firms	All firms	All firms	All firms[37]	All firms
7	Compensation following unfair dismissal	All firms	All firms	All firms	All firms	All firms	All firms	All firms
8	Possibility of reinstatement following unfair dismissal	All firms	All firms	All firms	All firms	All firms	All firms	All firms
9	Maximum time to make a claim of unfair dismissal	All firms	All firms	All firms	All firms	All firm	All firms	All firms
18	Definition of collective dismissal	**Only firms>20 employees**	**Only firms > 20 employees**	**Only firms > 20 employees**	**Only firms > 20 employees**	**Only firms > 20 employees**	All firms[38]	**Only firms > 20 employees**
19	Additional notification requirements in case of collective dismissals	**Only firms>20 employees**	**Only firms > 20 employees**	**Only firms > 20 employees**	**Only firms > 20 employees**	**Only firms > 20 employees**	All firms	**Only firms > 20 employees**
20	Additional delays involved in case of collective dismissals	**Only firms>20 employees**	**Only firms > 20 employees**	**Only firms > 20 employees**	**Only firms > 20 employees**	**Only firms > 20 employees**[39]	All firms	**Only firms > 30 employees**
21	Other special costs to employers in case of collective dismissals	**Only firms > 20 employees**	**Only firms > 10 employees**[40]	**Only firms > 20 employees**	**Only firms > 20 employees**	**Only firms > 20 employees**	All firms	All firms

[35] Since 2003 there is lower protection against unfair dismissal for older workers employed in an Austrian company with less than 5 employees. This latter aspect is not reflected in the re-coding exercise.
[36] For Croatian firms with less than 20 employees, the score is set at 0.
[37] During the trial period, Estonian firms are hardly under no regulation at all. So, for example, protection against unfair dismissal does not apply but nonetheless firms are subject to the same notification rules of the general contractual regime. This aspect is not reflected in the re-coding exercise.
[38] In Estonia, the definition of collective dismissal varies by size class. For firms up to 100 employees, the sub-index is re-coded as 4.5; for all others, as 3.
[39] Danish firms with more than 100 employees are subject to additional delays. For these firms, the sub-index is re-coded as 3.
[40] Since 2005, Belgian firms with less than 10 employees are not under the obligation to pay a redundancy allowance. Firms with between 10 and 19 employees are under the same obligation in the case of workers with an open-ended contract. The same provision can be extended to firms with at least 5 employees through collective bargaining. Before 2005, firms with less than 20 employees were exempted from the redundancy allowance.

Table C2 (continued): Size-contingent employment protection for regular contracts including additional provision for collective dismissal

	Level 4	Germany	Italy	Latvia	Lithuania	Portugal	Romania	Slovenia	Spain
1	Notification procedures	**Only firms > 10 employees**[41]	**Only firms > 15 employees**[42]	All firms	All firms	**Only firms > 10 employees**[43]	All firms	All firms	All firms
2	Delay involved before notice can start	**Only firms > 10 employees**[44]	**Only firms > 15 employees**[45]	All firms	All firms	**Only firms > 10 employees**[46]	All firms	All firms	All firms
3	Length of the notice period at 9 months tenure	All firms	All firms	All firms	All firms	**Only firms > 10 employees**[47]	All firms	**Only firms > 10 employees**[48]	All firms
	Length of the notice period at 4 years tenure	All firms	All firms	All firms	All firms	**Only firms >10 employees**	All firms	**Only firms > 10 employees**	All firms
	Length of the notice period at 20 years tenure	All firms	All firms	All firms	All firms	**Only firms > 10 employees**	All firms	**Only firms > 10 employees**	All firms
4	Severance pay at 9 months tenure	**Only firms > 10 employees**[49]	All firms[50]	All firms	All firms	**Only firms > 10 employees**	All firms	All firms	**Only firms > 25 employees**[51]

[41] Since 2003 German firms with less than 10 employees are not subject to specific notification requirements. For these firms, the sub-index is re-coded as 0. However, those hired before 2004 remain protected provided they work in a firm with more than 5 employees. This latter aspect is not reflected in the re-coding exercise.
[42] Italian firms with less than 15 employees are not subject to specific notification requirements. For these firms (up to 9 employees), the sub-index is re-coded as 0.
[43] For Portuguese firms with less than 10 employees, in the case of disciplinary dismissal, notification to a third party is not necessary but the employer would nonetheless be bound to communicate in writing to the employee. For these firms, the sub-index is revised downwards to 2 assuming that all lay-offs are indeed disciplinary.
[44] Since 2003 German firms with less than 10 employees do not encounter additional delays. For these firms, the sub-index is re-coded as 0. However, those hired before 2004 are subject to old rules including the additional delays provided they work in a firm with more than 5 employees. This latter aspect is not reflected in the re-coding exercise.
[45] Italian firms with less than 15 employees may be nonetheless subject to additional delays if so established in a collective agreement, for which normally dismissal notice may only be given on either 1st or 16th day of the month. For these firms (up to 9 employees), the sub-index is revised downwards to 1 assuming there is one such collective agreement.
[46] For Portuguese firms with less than 10 employees, standard additional delays do not apply but it is assumed that some delay is nonetheless present. For these firms, the sub-index is revised downwards to 1.
[47] For Portuguese firms with less than 10 employees there are no statutory rules for notice period. For these firms, the sub-index is re-coded as 0.
[48] Slovenian firms with less than 10 employees are subject to a shorter notice period than the one foreseen in the general contractual regime, yet if and only if a collective agreement establishes so. For these firms, the sub-index is revised downwards by 1 unit-value per tenure.
[49] Since 2003 German firms with less than 10 employees are not subject to statutory rules for severance pay. For these firms, the sub-index is re-coded as 0. However, those hired before 2004 have access to severance payments provided they work in a firm with more than 5 employees. This latter aspect is not reflected in the re-coding exercise.
[50] Italian firms are not subject to statutory rules for severance pay but these are generally provided via collective agreements. For all firms, the sub-index is revised upwards to 1 for all tenures.
[51] Spanish firms with less than 25 employees are subject to an indemnity that is the same that applies to all other firms but 40% of it is paid until 2014 by the Wage Guarantee Fund. For these firms, the sub-index is revised downwards by 1 unit-value per tenure.

	Severance pay at 4 years tenure	**Only firms > 10 employees**	All firms	All firms	All firms	**Only firms > 10 employees**	All firms	All firms	**Only firms > 25 employees**
	Severance pay at 20 years tenure	**Only firms > 10 employees**	All firms	All firms	All firms	**Only firms > 10 employees**	All firms	All firms	**Only firms > 25 employees**
5	Definition of unjustified or unfair dismissal	**Only firms with > 10 employees**[52]	**Only firms > 15 employees**	All firms	All firms	All firms	All firms	All firms	All firms
6	Length of trial period	All firms	All firms	All firms	All firms	**Only firms > 10 employees**[53]	All firms	All firms	**Only firms > 25/50 employees**[54]
7	Compensation following unfair dismissal	**Only firms > 10 employees**[55]	**Only firms > 15 employees**[56]	All firms	All firms	All firms[57]	All firms	All firms	All firms
8	Possibility of reinstatement following unfair dismissal	**Only firms > 10 employees**[58]	**Only firms > 15 employees**	All firms	All firms	**Only firms > 10 employees**	All firms	All firms	All firms
9	Maximum time to make a claim of unfair dismissal	**Only firms > 10 employees**[59]	All firms	All firms	All firms	All firms	All firms	All firms	All firms

[52] German firms with less than 10 employees are exempted from regular employment protection legislation. Still, workers receive special protection in the case of unfair dismissal. For these firms, the sub-index is re-coded as 2.

[53] Portuguese firms with less than 10 employees are exempted from regular employment protection legislation, including the maximum duration of the trial period. Nevertheless, smaller firms that are subject to duration limits are hardly under no regulation at all. So, for example, firms are still obliged to provide notice to a worker prior to dismissal, only the notice period is shorter. This latter aspect is not reflected in the re-coding exercise.

[54] The average length of trial period ranges between 6 months (qualified technicians) and 2 months (all other workers), unless a collective agreement establishes a different duration. In Spanish firms with less than 25 employees, the standard trial period is 3 instead of 2 months. However, following the OECD coding methodology, the difference in duration does not require re-coding. Since 2012, firms with less than 50 employees that did not make unfair or collective dismissal in the 6 months preceding the new hire could extend the trial period to up to 1 year. In this case, the difference in duration is significant, hence the value of the sub-index is revised downwards for all exempted firms against the assumption that they all qualify for an extension of the standard maximum duration.

[55] German firms with less than 10 employees are exempted from regular employment protection legislation. Still, workers receive special protection in the case of unfair dismissal, hence the score is not differentiated for size classes.

[56] Italian firm with less than 15 employees are not subject to the general contractual regime but they are equally obliged to compensation up to a maximum of 10 months. For these firms, the sub-index is re-coded as 2.

[57] Portuguese firms with less than 10 employees do not have mandatory reinstatement but the indemnity is doubled when it substitutes reinstatement. For these firms, the value of the sub-index is maintained equal to that of larger firms.

[58] German firms with less than 10 employees are exempted from regular employment protection legislation. Still, workers receive special protection in the case of unfair dismissal, hence the score is not differentiated for size classes.

[59] German firms with less than 10 employees are exempted from regular employment protection legislation. Still, workers receive special protection in the case of unfair dismissal, hence the score is not differentiated for size classes.

18	Definition of collective dismissal	**Only firms > 20 employees**	**Only firms > 15 employees**	**Only firms > 20 employees[60]**	All firms[61]	All firms[62]	**Only firms > 20 employees**	**Only firms > 20 employees[63]**	All firms[64]
19	Additional notification requirements in case of collective dismissals	**Only firms > 20 employees**	**Only firms > 15 employees**	**Only firms > 20 employees**	All firms	All firms	**Only firms > 20 employees**	**Only firms > 20 employees**	All firms
20	Additional delays involved in case of collective dismissals	**Only firms > 20 employees**	**Only firms > 15 employees**	**Only firms > 20 employees**	All firms	All firms	**Only firms > 20 employees**	**Only firms > 20 employees**	**Only firms > 50 employees[65]**
21	Other special costs to employers in case of collective dismissals	**Only firms > 20 employees**	**Only firms > 15 employees**	**Only firms > 20 employees**	All firms	All firms	**Only firms > 20 employees**	**Only firms > 20 employees**	**Only firms > 50 employees[66]**

Source: Own elaboration based on the OECD Employment Protection Legislation (2013), ILO's EP-Lex and the European Commission's LABREF Database.

[60] In Latvia, the definition of collective dismissal varies by size class. For firms up to 100 employees, the sub-index is re-coded as 4.5; for all others, as 3.

[61] In Latvia, the definition of collective dismissal varies by size class. For firms up to 100 employees, the sub-index is re-coded as 4.5; for all others, as 3.

[62] In Portuguese firms with less than 50 employees, dismissal of two workers counts as collective, whereas in firms with more than 50 employees, dismissal of 5 employees counts as collective.

[63] In Latvia, the definition of collective dismissal varies by size class. For firms up to 100 employees, the sub-index is re-coded as 4.5; for all others, as 3.

[64] In Spain, the definition of collective dismissal varies by size class. In Spanish firms with more than 5 employees, dismissal of the entire workforce is also considered collective dismissal.

[65] In Spanish firms with less than 50 employees, the consultation period with worker representatives is reduced by half. For these firms, the sub-index is re-coded as 1.

[66] Spanish firms carrying out a collective dismissal affecting more than 50 workers should offer to employees concerned an external replacement plan through the authorized employment agencies. Moreover, two successive reforms in 2011 and 2012 specify additional costs for firms firing older works when the collective dismissal concerns at least 100 employees. This latter aspect is not reflected in the re-coding exercise.

Annex D – Corporate tax exemptions

Table D1: Targeted corporate income tax rates – small business income

		Belgium	France	Latvia	Lithuania	Luxembourg	Netherlands	Poland
1	Criteria for targeting	**Progressive tax rates, first 100.000 euro of taxable profit and < 50 employees (lowest)[67]**	**Turnover < 7.63 mio euro on first 38.120 euro of taxable profit (lowest); turnover < 50 mio euro and < 250 employees on first 75.000 euro of taxable profit (2017)[68]**	**Revenue < 40.000 euro and < 5 employees[69]**	**Revenue < 300.000 euro and < 10 employees[70]**	**Revenue < 25.000 euro or between 25.000 and 30.000 euro**	**Taxable income < 22.689 euro (2000-2006); < 60.000 euro (2007); < 275.000 euro (2008); < 200.000 euro (2009-2018) and < 250 employees**	**Revenue < 1.2 mio euro**
2	Central government corporate income tax rate	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Central government corporate income tax rate exclusive of surtax	Yes	No	No	No/Yes	Yes	No	No
	Central government corporate income tax rate less deductions for sub-national taxes	Yes	No	Yes	Yes	Yes	Yes	Yes
	Sub-central government corporate income tax rate	No	No	No	No	Yes	No	No

[67] Since 2016, progressive tax rates apply to profit thresholds only for small firms with < 50 employees. Since 2018, single reduced tax rate applies to first 100.000 of taxable profit provided two out of following three conditions are met: i) firms < 50 employees; ii) turnover < 9 mio euro (VAT excluded), iii) balance sheet total < 4.5 mio euro.
[68] Since 2018, reduced tax rate of 28% (highest) applies to first 500.000 euro of taxable profit for all firms.
[69] The microenterprise tax was introduced on 1 October 2010 and covers payroll taxes, the business risk state fee and corporate income taxes.
[70] The reduced rate is in place since 2017.

Table D1 (continued): Targeted corporate income tax rates – small business income

	Portugal	Spain
Criteria for targeting	**Revenue < 200.000 euro (2012-2018) and < 149.640 euro (1999-2011)[71]**	**New start-ups and/or firms with turnover < 1 mio euro (2016)**
Central government corporate income tax rate	Yes	Yes
Central government corporate income tax rate exclusive of surtax	No	No
Central government corporate income tax rate less deductions for sub-national taxes	Yes	Yes
Sub-central government corporate income tax rate	Yes	No

Source: Own elaboration based on the OECD Tax Database and PWC Worldwide Tax Summaries.

[71] Reduced rates apply to firms with gross income < 149.640 euro from 1999 to 2001. From 2001 to 2010, the same firms are subject to a simplified (more generous) tax regime. Since 2012, a simplified regime applies to firms with revenue < 200.000 euro and a rate of 17% for SME.

Halle Institute for Economic Research –
Member of the Leibniz Association

Kleine Maerkerstrasse 8
D-06108 Halle (Saale), Germany

Postal Adress: P.O. Box 11 03 61
D-06017 Halle (Saale), Germany

Tel +49 345 7753 60
Fax +49 345 7753 820

www.iwh-halle.de
www.comp-net.org

ISSN 2513-1303

Leibniz
Association