



Utrecht University

School of Economics

Unpacking the effects of employment protection legislation on the allocation of entrepreneurial activity in society

Werner Liebregts
Erik Stam

**Tjalling C. Koopmans Research Institute
Utrecht School of Economics
Utrecht University**

Kriekenpitplein 21-22
3584 EC Utrecht
The Netherlands
telephone +31 30 253 9800
fax +31 30 253 7373
website www.koopmansinstitute.uu.nl

The Tjalling C. Koopmans Institute is the research institute and research school of Utrecht School of Economics. It was founded in 2003, and named after Professor Tjalling C. Koopmans, Dutch-born Nobel Prize laureate in economics of 1975.

In the discussion papers series the Koopmans Institute publishes results of ongoing research for early dissemination of research results, and to enhance discussion with colleagues.

Please send any comments and suggestions on the Koopmans institute, or this series to J.M.vanDort@uu.nl

ontwerp voorblad: WRIK Utrecht

How to reach the authors

Please direct all correspondence to the first author.

**Werner Liebrechts
Erik Stam**

Utrecht University
Utrecht School of Economics
Kriekenpitplein 21-22
3584 TC Utrecht
The Netherlands.
E-mail: W.J.Liebrechts@uu.nl

This paper can be downloaded at: [http://
www.uu.nl/rebo/economie/discussionpapers](http://www.uu.nl/rebo/economie/discussionpapers)

Unpacking the effects of employment protection legislation on the allocation of entrepreneurial activity in society

Werner Liebregts
Erik Stam

Utrecht School of Economics
Utrecht University

New version: April 2017

Abstract

Labor market institutions enable and constrain particular behaviors on the labor market and beyond. We take a closer look at country-level employment protection legislation (EPL) and its unintended effects on entrepreneurial activity in society. We unpack the effects of EPL by disentangling the mechanisms of two of its main elements, and their relationship with an individual's occupational status. More specifically, this study uses multilevel analyses to examine the separate effects of severance pay and the notice period on the allocation of entrepreneurial activity across employment and self-employment. Severance pay is found to be negatively related to entrepreneurial activity by employees, whereas the notice period shows a positive relationship. The opposite is true for the effects on self-employed individuals. Future use of one-dimensional measures of EPL should be reconsidered.

Keywords: labor market institutions, employment protection legislation, severance pay, notice period, entrepreneurial employee activity, self-employment

JEL classification: J24, J65, L26, M13, O43, O57

Acknowledgements

This research is partly financed by the Early Research Program (ERP) Human Enhancement and Innovation of the Netherlands Organization for Applied Scientific Research (TNO). The authors would like to thank the participants of the DRUID Academy Conference (Aalborg, January 2015), the ACED full paper presentations (Antwerp, June 2015), the IWH Workshop on Entrepreneurship and the Labor Market (Halle (Saale), April 2016), the Workshop on Institutions and Entrepreneurship (Reading, May 2016), and the UCSC Seminar (Milan, June 2016) for their helpful comments and constructive feedback on earlier versions of this paper.

Unpacking the effects of employment protection legislation on the allocation of entrepreneurial activity in society^{1,2}

Werner Liebrechts^{a,3} & Erik Stam^a

^a Utrecht University School of Economics, Utrecht, the Netherlands

Abstract

Labor market institutions enable and constrain particular behaviors on the labor market and beyond. We take a closer look at country-level employment protection legislation (EPL) and its unintended effects on entrepreneurial activity in society. We unpack the effects of EPL by disentangling the mechanisms of two of its main elements, and their relationship with an individual's occupational status. More specifically, this study uses multilevel analyses to examine the separate effects of severance pay and the notice period on the allocation of entrepreneurial activity across employment and self-employment. Severance pay is found to be negatively related to entrepreneurial activity by employees, whereas the notice period shows a positive relationship. The opposite is true for the effects on self-employed individuals. Future use of one-dimensional measures of EPL should be reconsidered.

Keywords: labor market institutions, employment protection legislation, severance pay, notice period, entrepreneurial employee activity, self-employment

JEL classification: J24, J65, L26, M13, O43, O57

¹ This research is partly financed by the Early Research Program (ERP) Human Enhancement and Innovation of the Netherlands Organization for Applied Scientific Research (TNO).

² The authors would like to thank the participants of the DRUID Academy Conference (Aalborg, January 2015), the ACED full paper presentations (Antwerp, June 2015), the IWH Workshop on Entrepreneurship and the Labor Market (Halle (Saale), April 2016), the Workshop on Institutions and Entrepreneurship (Reading, May 2016), and the UCSC Seminar (Milan, June 2016) for their helpful comments and constructive feedback on earlier versions of this paper.

³ Corresponding author. Address: Kriekenpitplein 21-22, 3584 EC, Utrecht, the Netherlands. Tel.: +31 30 253 9845. E-mail: W.J.Liebrechts@uu.nl.

1. Introduction

Institutions, the man-made rules of the game in society (North, 1990), have wide-ranging intended and unintended effects on economic action, and ultimately economic performance (Acemoglu & Robinson, 2012; Chang, 2011; Nickell & Layard, 1999). Institutions define the relative rewards for different occupations, and hence, play a key role in the allocation of talent in society (Acemoglu, 1995; Baumol, 1990; Murphy, Shleifer & Vishny, 1991). The impact of labor market institutions on labor market outcomes has been the topic of recurrent policy discussions and much research (see e.g. Acemoglu & Angrist, 2001; Belot, Boone & Van Ours, 2007; Blanchard & Tirole, 2008; Holmlund, 2014). Labor market institutions are usually thought of as policy interventions or collective provisions that interfere with employment and wage determination (Bertola, 1990; Bertola & Rogerson, 1997), and perhaps unintentionally with occupational choices (Baumann & Brändle, 2012). One particular and often discussed type of labor market institutions is employment protection legislation (EPL). EPL consists of rules and procedures that define the limits of employers to hire and fire workers in employment relationships (see e.g. OECD, 2013; Skedinger, 2010).

During the second half of the twentieth century, many countries – mostly European – enacted laws on employment protection (Holmlund, 2014). The standard argument in favor of such laws is the protection of employees against fair or unfair dismissal by their employers (Bertola, Boeri & Cazes, 2000). Opponents argue that employment levels decrease, because employers are less likely to hire new employees (Kahn, 2007; 2010). Given the difficulty and hence costs of firing employees, attracting new workers is risky, and so, employers are reluctant to hire more of them. Under the assumption of optimal EPL and properly designed labor contracts, EPL does not affect employment levels (Lazear, 1990; Pissarides, 2001). EPL thus has theoretically ambiguous effects on employment and unemployment levels in societies (Kahn, 2010).

From a worker's point of view, EPL imposes significant opportunity costs on self-employment (Amit, Muller & Cockburn, 1995; Baumann & Brändle, 2012). Employees considering to become self-employed have to give up their legal rights as an employee, and will think twice before they actually do so. Shane & Venkataraman (2000) define entrepreneurship as the discovery, evaluation and exploitation of opportunities to create future goods and services by individuals, and so, do not limit entrepreneurship to those setting up an independent business, or owning-managing a new business for own risk and reward (Jensen & Meckling, 1976; Knight, 1921). In fact, workers with entrepreneurial abilities might also opt for the engagement in entrepreneurship within established organizations (see e.g. Antoncic &

Hisrich, 2001; 2003; Foss & Lyngsie, 2014; Subramanian, 2005; Parker, 2011). Labor mobility across employment and self-employment, especially by workers with entrepreneurial abilities, is likely to be affected by EPL. Put differently, EPL is expected to affect the allocation of entrepreneurial activity across new and established organizations in a country.

This study examines whether the strictness of a country's EPL has an effect on individuals' occupational status, which may be either employed or self-employed. In turn, the category of employed individuals consists of both employees undertaking entrepreneurial activities for their employer, also referred to as entrepreneurial employee activity, and those who do not. We use multilevel analyses to disentangle the mechanisms of two main elements of EPL, i.e. severance pay and the notice period, and their effect on the allocation of entrepreneurial activity across employment and self-employment.

The objective of this paper is to provide a better understanding of how labor market regulations, in particular two of EPL's components, affect the allocation of entrepreneurial talent in society. We hereby make a threefold contribution to the extant literature. First and foremost, entrepreneurial employees are only recently acknowledged and internationally measured as a separate category of entrepreneurially active individuals (Bosma et al., 2013b; Stam, 2013). As such, we are able to take a closer look at the allocation of entrepreneurial activity across employed and self-employed individuals. Second, we investigate the effects of country-level EPL on individual-level occupational status, whereas most studies so far focused on macro effects, such as changes in unemployment, employment, and/or self-employment levels (see e.g. Kahn, 2010; Lazear, 1990; Robson, 2003; Torrini, 2005). Third, we estimate the separate effects of the two main elements of EPL. Many studies have used a composite index instead to measure countries' entire system of provisions regarding employment protection. Given the complex multi-dimensional nature of EPL, we provide a more fine-grained analysis by separating two of its underlying mechanisms (Lazear, 1990; Pissarides, 2001).

Our regression models are multilevel in nature due to the inclusion of explanatory variables at different levels of analysis. For our dependent variable we make use of the 2011 Adult Population Survey (APS) of the Global Entrepreneurship Monitor (GEM). According to the GEM, employees are involved in entrepreneurial activity if they take the lead in the developmental process of new business activities for their employer (Bosma et al., 2013b). We use data from both the World Bank (WB) and the Organisation for Economic Co-operation and Development (OECD) on countries' legislation regarding severance payments and advance notice of contract termination (Nicoletti, Scarpetta & Boylaud, 1999).

2. Theory and hypotheses

In his influential paper about productive, unproductive or even destructive entrepreneurship, Baumol (1990) already speculated that there might be a 'true' rate of entrepreneurship. This rate is said to be more or less equal across countries, but its appearance, in established or newly established organizations, depends on the incentive structure created by the institutional framework. Institutions define the relative pay-offs to different occupations, and thereby determine the allocation of talent in society (Acemoglu, 1995; Baumol, 1990; Murphy et al., 1991). EPL is a specific type of labor market institution, and in that sense part of a country's formal institutional framework. Pissarides (2001: 136) defines employment protection as follows: "Any set of regulations, either legislated or written in labor contracts, that limit the employer's ability to dismiss the worker without delay or cost."

Most research so far only focused on the macro effects of employment protection. Theoretically, employment protection has ambiguous effects, because there are two mechanisms at play. On the one hand, EPL increases the costs of firing, making it more complicated to fire workers, and so, better protection is expected to have a positive effect on employment levels (Bertola, 1992; Bertola et al., 2000). Simultaneously, and for similar reasons, stricter EPL is expected to have a negative effect on unemployment levels. On the other hand, EPL increases the (future) costs of firing, making it less attractive to hire new workers, and so, it will result in lower employment and higher unemployment levels (Kahn, 2007; 2010).

Using a theoretical model, Lazear (1990) shows that severance pay requirements do not have to influence employment levels in a perfect market. If labor contracts are properly designed, meaning that each government-ordered monetary transfer from employer to employee will be undone by a contractual transfer of the same size from employee to employer, then severance pay has no effect on the level of employment. This is confirmed by a theoretical model of Pissarides (2001); optimally chosen severance pay and notice period have no influence on employment levels. His simulations also show that optimally chosen EPL does not reduce job creation.

Empirical findings are inconclusive regarding the effects of composite EPL indicators on unemployment, employment, and/or self-employment rates. Addison & Teixeira (2003) mapped part of the modern empirical literature on the labor market consequences of employment protection, and come to three main conclusions: stricter EPL (1) increases structural unemployment, (2) reduces employment on

average, and (3) is positively associated with self-employment. Cahuc & Postel-Vinay (2002) note that firing restrictions may or may not cut unemployment, with the impact being very limited in either direction. Micco & Pagés (2006) find more stringent EPL to be the cause of a decrease in employment, driven by a decline in the net entry of firms. Román, Congregado & Millán (2011) conclude that strict EPL promotes dependent self-employment, because employers are encouraged to contract-out work to self-employed, which used to be done by employees. Others, however, find no robust or even a negative relationship between EPL and self-employment (Robson, 2003; Torrini, 2005). Millán, Millán, Román & Van Stel (2013) show that the strictness of EPL is negatively related to labor mobility among small firms.

The aforementioned studies all faced difficulties in formulating a satisfactory one-dimensional measure of EPL, which calls for a more fine-grained analysis of the effects of its most important elements. But, most notably, they did not take into account entrepreneurial activity by employees within established firms, often referred to as intrapreneurship (see e.g. Antoncic & Hisrich, 2001; 2003; Subramanian, 2005; Parker, 2011). Instead, self-employment is seen as the only route that entrepreneurial individuals can take. Bosma, Stam & Wennekers (2013a) find that the prevalence of intrapreneurship and independent entrepreneurship are negatively correlated at the macro level; more intrapreneurship means less independent entrepreneurship in society, and vice versa. This suggests that these two modes of entrepreneurial activity are substitutes rather than complements at the national level, confirming the allocation of entrepreneurship perspective by Baumol (1990). Bosma et al. (2013a) also conclude that both formal and informal institutions influence the allocation of talent across the two modes of entrepreneurial activity. More specifically, they expect social security favoring employment over self-employment to positively affect the share of entrepreneurial employees in a country.

Likewise, we investigate two main elements of the formal institution employment protection, i.e. severance pay and the notice period, which both favor employment over self-employment, and the more so if set stricter. Within the category of employed individuals we further distinguish between entrepreneurial employees and those who do not qualify as such. Someone is identified as an entrepreneurial employee if he is continuously involved in the developmental processes of new business activities for his main employer, and when he has (had) a leading role in the phase of idea development and/or the phase of preparation and implementation (Bosma et al., 2013b). Examples of new business activities include setting up a new business unit, establishment, or subsidiary, but also the development of a new product, service, or product-market combination.

From a worker's perspective, the opportunity costs of self-employment increase with stricter requirements regarding the dismissal of workers (Amit et al., 1995). Put differently, EPL raises the expected income of dependent employment (Baumann & Brändle, 2012). Employed individuals will think twice before they decide to make a step towards self-employment, since they have to give up their legal protection rights as an employee. So, employees rather stay employed, and there is a higher chance that they are able to do so. At the same time, employers are less likely to hire new employees given the difficulty and hence costs of firing them, lowering unemployed individuals' chance to become employed, let alone to become entrepreneurially active as an employee.

The increased opportunity costs of self-employment due to stricter EPL negatively influence the likelihood that people will be self-employed (Amit et al., 1995; Baumann & Brändle, 2012). Focusing solely on entrepreneurial individuals, we expect a higher chance of being entrepreneurially active as an employee instead. Most empirical studies on EPL have taken the composite indicator as the explanatory variable, while most theoretical studies have focused on the effects of severance pay only. In this study, we neither take the composite indicator of EPL nor the height of severance payments only, but analyze the effects of the two most important elements of a country's legal system concerning employment protection, namely both severance pay and the notice period. We hypothesize that both elements are positively related to individuals being entrepreneurially active as employees. This leads to the following hypotheses:

Hypothesis 1a: Country-level legislation on severance pay is positively related to an individual being entrepreneurially active as an employee.

Hypothesis 1b: Country-level legislation on the notice period is positively related to an individual being entrepreneurially active as an employee.

For similar reasons, both elements of EPL are expected to be negatively related to individuals being self-employed. This leads to the following hypotheses:

Hypothesis 2a: Country-level legislation on severance pay is negatively related to an individual being self-employed.

Hypothesis 2b: Country-level legislation on the notice period is negatively related to an individual being self-employed.

3. Data

The data comes from a variety of sources with the Global Entrepreneurship Monitor (GEM) being the most important one. The GEM is an annual large-scale international study on the prevalence of entrepreneurship as of 1999. The 2011 edition of the GEM Adult Population Survey (APS) was the first one to include entrepreneurial employee activity as a special topic.⁴ More than 156k individuals coming from 52 countries completed the survey. The 52 participating countries include (1) six factor-driven economies (i.e. Algeria, Bangladesh, Iran, Jamaica, Pakistan and Venezuela), (2) 24 efficiency-driven economies (i.e. Argentina, Barbados, Bosnia and Herzegovina, Brazil, Chile, China, Colombia, Malaysia, Mexico, Panama, Peru, South Africa, Thailand, Trinidad and Tobago, Uruguay and most of Eastern Europe), and (3) 22 innovation-driven economies (i.e. Australia, Japan, South Korea, Singapore, Taiwan, the United Arab Emirates, the United States and most of Western Europe). This follows a classification of countries into three stages of economic development by the World Economic Forum (WEF), and corresponds to a distinction between developing, transition and developed countries, respectively. As such, the data set covers a wide range of countries at different stages of economic development.

Dependent variable

Amongst others, the GEM 2011 APS asked for the respondents' occupational status, referring to whether someone is currently employed (either part-time or full-time), self-employed, unemployed, not working (i.e. retired or disabled), a student, or a full-time homemaker. A specific set of questions is then targeted at all adult employees in the sample in order to determine who can be regarded as entrepreneurially active. This is the case when individuals have been involved in the development of new business activities for their main employer in the past three years, and have had a leading role in at

⁴ Apart from the pilot study in 2008, in which eleven countries participated to measure their rate of entrepreneurial employee activity.

least one of the two phases of this developmental process, being the phase of idea development (or, ideation) and the phase of preparation and implementation (Bosma et al., 2013b). When someone is also currently involved in such a development, he or she satisfies a more narrow definition of entrepreneurial employee activity. Hence, these individuals are continuously active and leading as entrepreneurial employees. On average, only 2.8% of the adult population satisfies the latter definition. Typically, innovation-driven economies demonstrate higher prevalence rates of entrepreneurial employee activity than less well-developed economies (Bosma et al., 2013b; Kelley, Singer & Herrington, 2016). Other stylized facts show that to a certain extent entrepreneurial employee activity is a substitute of independent entrepreneurial activity, since in general, the share of entrepreneurial employee activity in overall entrepreneurial activity in society declines with the level of independent entrepreneurial activity (Bosma et al., 2013a).

The dependent variable is an unordered categorical variable, which indicates an individual's occupational status. Individuals that are employed by others, either in part-time or full-time work, are treated as the base category. The second category consists of individuals involved in entrepreneurial employee activity according to the GEM's narrow definition. Finally, self-employed people belong to the third and last category.

Table 1 presents the descriptive statistics of the dependent variable. Due to the focus on the working part of the adult population, all other kinds of occupational statuses are omitted, and we end up with a data set covering more than 91k individuals. It appears that a vast majority of the full sample, i.e. 67.1%, is employed and not entrepreneurially active, whilst only 3.7% is employed and involved in entrepreneurial activity. This comes down to 5.3% of the employees being entrepreneurially active. Approximately 30% of the sample is self-employed.

[INSERT TABLE 1 ABOUT HERE]

Independent variables of interest

The World Bank and the OECD both gather EPL data, and thus serve as a source for information on countries' legal height of severance payments and length of the notice period. The World Bank's Doing Business ranking incorporates a variety of measures of labor market policy, of which the Employing

Workers indicators refer to EPL. These indicators cover (1) the difficulty of hiring, (2) the difficulty of firing, (3) firing costs, and (4) hours rigidity. Our focus is on the two main items of the firing costs for employers, namely severance pay and the notice period for redundancy dismissal, both measured in terms of salary weeks. Workers with more years of tenure are typically better protected against dismissal, and so, it might be useful to distinguish between workers with one, five and ten years of tenure, but the main conclusions are drawn based upon the averages of severance pay and the notice period for workers at different years of tenure.

The OECD distinguishes between five categories of employment protection, namely (1) severance payment, (2) advance notice of termination, (3) administrative procedures, (4) difficulty of dismissal, and (5) additional measures for collective dismissals (Nicoletti et al., 1999). Our main interest is in the first and second category. Both can be viewed as some sort of transfer from the employer to the employee – a direct money transfer in case of severance payment, and an information transfer in case of advance notice of termination of a labor contract – whereas the other three categories seem to be procedural ways to impede employers to dismiss a worker. Nonetheless, they might induce employers to delay a (collective) dismissal, or to buy off employees in order to avoid lengthy negotiations, and in that sense they may act like a severance payment or notice period. The OECD thus measures EPL by looking at the procedures and costs involved in dismissing individuals or groups of workers, and the procedures involved in hiring workers on fixed-term or temporary work agency contracts. This is reflected in three main indicators, namely (1) individual dismissal of workers with regular contracts, (2) additional costs for collective dismissals, and (3) regulation of temporary contracts. Part of the first indicator are items indicating severance pay and the length of the notice period (both measured in months). Both items distinguish between workers at nine months, four years and twenty years tenure, but again, we mainly focus on the averages for workers at different years of tenure.

Both the World Bank and the OECD data set contain time series – in case of some of the OECD indicators even ranging from 1985 to 2013 – but we only use 2011 data due to the restricted availability of the GEM data. However, it must be noted that institutional regimes are often hard to change, and indeed, it appears that EPL remains fairly stable over time in most of the countries. The World Bank has EPL data on 214 countries, including 50 out of the 52 GEM countries, whereas the OECD data set only covers 43 countries, of which 29 are also covered by the GEM.

It should be emphasized that none of the used elements of EPL, or a combination of those elements, fully covers a country's EPL. Each item addresses part of a country's full set of provisions regarding

employment protection. Also think of collective agreements, agreed upon at the regional or sectoral level, and containing all kinds of provisions not covered by legislation imposed at the national level. We argue, however, that severance pay and the notice period are among a country's most important provisions relating to employment protection. Moreover, in most countries, severance payments and notice periods in collective agreements are usually similar to those set out in national-level legislation (Venn, 2009).

Control variables

The regression models take into account a number of controls at different levels. All of them stem from the GEM 2011 APS, except for the 2011 unemployment rate, which is collected by the World Bank. It is likely that the level of unemployment in a country affects the allocation of individuals over employment and self-employment. The GDP per capita is also considered to be an important country-level control variable when predicting an individual's occupational choice. As mentioned before, economic development typically leads to higher prevalence rates of entrepreneurial employee activity (Bosma et al., 2013b; Kelley et al., 2016). Demographic characteristics like age and gender, characteristics capturing cognitive ability like educational level, and the household income are included as control variables at the individual level.

Descriptive statistics of the independent variables

Table 2 shows the descriptive statistics of the independent variables, including the controls. Note that the World Bank indicators of EPL are given in weeks, whereas the OECD indicators are measured in months. Still, the mean values of the indicators differ quite substantially. For example, the average notice period according to the World Bank is slightly more than a month, while it is almost two months according to the OECD. This is likely to be the result of a different sample of countries; the World Bank also has information on less well-developed countries as compared to the OECD. Both job security provisions become more generous towards workers with more years of tenure, as expected (not shown here). The largest part of the sample is middle-aged (35 to 44 years, 27.4%), and the majority are men (56.0%). The 2011 unemployment rate ranges from 0.7% (in Thailand) up to 27.6% (in Bosnia and Herzegovina).

[INSERT TABLE 2 ABOUT HERE]

Figure 1 and figure 2 represent scatter plots that have countries' severance pay on the horizontal axis, and the notice period on the vertical axis – according to World Bank and OECD data, respectively – and reveal substantial dispersion. Hence, there is no clear relationship between the strictness of severance pay and the notice period within countries. At best, we can observe a weak negative relationship within the sample of OECD countries only.

[INSERT FIGURE 1 ABOUT HERE]

[INSERT FIGURE 2 ABOUT HERE]

Figures 3 to 6 again show the large variety in the way countries set out their severance pay and the notice period in national-level legislation. At first, countries are split up into their respective categories – either a factor-, efficiency- or innovation-driven economy – after which they are ranked based on the strictness of the provision. Legislation on severance payments and the notice period appears to differ quite substantially within yet not so much between the three development categories. This holds true for both World Bank and OECD data.

[INSERT FIGURE 3 ABOUT HERE]

[INSERT FIGURE 4 ABOUT HERE]

[INSERT FIGURE 5 ABOUT HERE]

[INSERT FIGURE 6 ABOUT HERE]

4. Methodology

Both entrepreneurial employee activity and self-employment are not only affected by the national context, but also by individual characteristics. This implies that disentangling the determinants of the allocation of entrepreneurial activity necessitates a multilevel analysis (Bjørnskov & Foss, 2016). In this way, we are able to unravel the direct effects of determinants at different levels as well as possible cross-level interactions. More specifically, we are both able to investigate the effects of a country's severance pay and notice period on an individual's occupational status and, for example, whether or not these effects depend on his or her age.

The composed data set has a hierarchical data structure; it includes variables on the individual level as well as on the national level. Traditional approaches to deal with hierarchical data are either disaggregating all variables to the lowest level, or aggregating all variables to the highest level, followed by standard analyses like multiple regression analyses. However, with hierarchical data, observations are not independent, errors are not independent, and different observations may have errors with different variances (i.e. heteroscedastic errors), whilst multiple regression analysis assumes exactly the opposite. Observations of individuals within the same group (or, country in this case) tend to be more similar as compared to observations between different groups. This may be due to selection issues or a shared history of the individuals within a group. Multilevel techniques account for the fact that most variables have both within-group and between-group variation, and that the effect of an individual-level explanatory variable may well be different across different groups.

In general, the lowest level of a basic multilevel regression model is represented by the following equation:

$$y_{ij} = \beta_{0j} + \beta_{1j}x_{ij} + \varepsilon_{ij} \quad (4.1)$$

At the second level, we have

$$\beta_{0j} = \gamma_{00} + \gamma_{01}z_j + u_{0j} \quad (4.2)$$

and

$$\beta_{1j} = \gamma_{10} + \gamma_{11}z_j + u_{1j} \quad (4.3)$$

Substitution of equations 4.2 and 4.3 into equation 4.1 and rearrangement of terms leads to the following single-equation version of a two-level regression model, with only one explanatory variable per level:

$$y_{ij} = \gamma_{00} + \gamma_{10}x_{ij} + \gamma_{01}z_j + \gamma_{11}z_jx_{ij} + u_{1j}x_{ij} + u_{0j} + \varepsilon_{ij} \quad (4.4)$$

Here, y_{ij} is the dependent variable, where the subscript i refers to individuals ($i = 1, \dots, n_j$), and the subscript j refers to groups ($j = 1, \dots, J$). The right-hand side of the equation is split up into a fixed (or, deterministic) and a random (or, stochastic) part, respectively. The term x_{ij} is an individual-level independent variable, whereas z_j is a group-level independent variable. Note that the model indeed contains a cross-level interaction term z_jx_{ij} .

Usually, as is the case in this study, one deals with more than one explanatory variable at both levels. Assume that there are P explanatory variables x at the lowest (individual) level, indicated by the subscript p ($p = 1, \dots, P$), and Q explanatory variables z at the highest (group) level, indicated by the subscript q , ($q = 1, \dots, Q$). The more general equation is then given by:

$$y_{ij} = \gamma_{00} + \gamma_{p0}x_{pij} + \gamma_{0q}z_{qj} + \gamma_{pq}z_{qj}x_{pij} + u_{pj}x_{pij} + u_{0j} + \varepsilon_{ij} \quad (4.5)$$

Our basic model consists of twelve individual-level explanatory variables representing an individual's age, gender, educational level and household income, and two country-level explanatory variables, namely a country's log GDP per capita and unemployment rate. The full multilevel regression models also include the severance pay and notice period variables for workers with different years of tenure, and hence, $p = 1, \dots, 12$ and $q = 1, \dots, 4$. Due to the specific form of the dependent variable (i.e.

unordered categorical), we estimate so-called multilevel mixed-effects multinomial logistic regression models.

5. Results

Correlation coefficients

The correlation coefficients between the dependent variable, the independent variables of interest, and the control variables, based on the full sample, are given in table 3. They already provide us with some insights into their mutual relationships.

[INSERT TABLE 3 ABOUT HERE]

Since our dependent variable is unordered categorical, we cannot draw any firm conclusions (yet) as to its correlation with any of the severance pay and notice period indicators. In case of both World Bank and OECD data, severance pay and the notice period are significantly and negatively correlated, so, on average, the higher the severance payments, the shorter the notice period, and vice versa. This is remarkable, because in the worst case employers can treat the notice period as if it is a severance payment by allowing employees not to be present during the notice period and paying them anyway.

The highest correlations can be found among the severance pay and notice period variables coming from different sources. For example, the correlation between the World Bank and OECD indicator of severance pay is 0.743, and highly significant. We may conclude that both data sources seem to assess the strictness of EPL in a fairly similar way.

Other correlation coefficients worth mentioning are those between the log GDP per capita and the severance pay variable, in case of both World Bank and OECD data. The highly significantly negative relationships (-0.575 and -0.594, respectively) point at more developed countries having less strict EPL in terms of severance pay requirements. The coefficients are inconclusive regarding its relationship with countries' legislated notice period.

Regression results

Table 4 shows the results of the main multilevel mixed-effects multinomial logistic regression models. Model 1 and 2 alternately include the World Bank and OECD variables regarding the average severance pay and notice period. As World Bank data is available for a larger number of countries, their sample sizes differ. The results of models 1 and 2 are based on data for 46 and 28 countries, respectively.⁵ Both models contain all aforementioned control variables. We have also run models in which we test the effects of the severance pay and notice period variables separately, and their results do not deviate from what is discussed next as to the direction and significance of the effects.⁶

[INSERT TABLE 4 ABOUT HERE]

The base outcome category of the two models is *Non-entrepreneurial employee*, such that all coefficients should be interpreted relative to this occupational status. A non-entrepreneurial employee is someone who is employed, either part-time or full-time, but does not qualify as an entrepreneurial employee, because he or she is not involved in developing new business activities for the employer. Coefficients are shown of the effects on the remaining two occupational statuses, i.e. *entrepreneurial employee* and *self-employed*, two ways in which an individual can be entrepreneurially active.

Contrarily to what we hypothesized in hypothesis 1a, severance pay is found to be negatively associated with the prevalence of entrepreneurial employees, although the effect is only weakly significant in case of World Bank data, and insignificant in case of OECD data. Hypothesis 1b is not rejected, since the notice period does have a significantly positive effect on individuals being entrepreneurially active as an employee. This effect is even relatively strong and highly significant in case of the sample with OECD countries only. Hypothesis 2a is rejected, since a country's legislated severance pay seems to be positively related to self-employed; the coefficient of the World Bank indicator is significantly positive. However, OECD data cannot confirm this finding. The coefficients of the notice period again show the

⁵ Hence, this is somewhat less than the 50 and 29 countries for which EPL data is available, because of missing data on some of the included controls with the GEM 2011 APS as the data source.

⁶ The regression results of these and various other specifications of the model (e.g. without control variables) are available upon request from the corresponding author.

expected sign; a longer notice period is negatively associated with being self-employed, as hypothesized in hypothesis 2b.

In any case, both provisions have an opposite effect on the different outcome categories. One can say that these findings are in line with the empirical results of the analyses by Addison & Grosso (1996), who revised Lazear's (1990) estimates, and concluded that severance pay has a negative effect on the employment level, whilst a longer notice period increases employment. If the latter is true, then it is more likely that, in the end, more people will be involved in entrepreneurial employee activity. The opposite is true regarding severance pay; if higher government-ordered severance payments decrease employment, entrepreneurial individuals tend to become self-employed earlier, since the opportunity of being entrepreneurially active within established organizations decreases.

Almost all control variables are highly significant; only countries' unemployment rate remains insignificant throughout both models. Their coefficients mostly have the expected sign. Age is positively related with being involved in entrepreneurial activity in general, so either as an employee or as self-employed. The largest effect on being an entrepreneurial employee can be found for individuals between 35 and 44 years of age. People above 55 years of age are most likely to be self-employed. Moreover, men have a higher probability of being entrepreneurially active than women, relative to being employed and not involved in entrepreneurial activity. A higher educational level as well as a higher household income are especially positive for being an entrepreneurial employee. Both controls are negatively related to self-employment, yet insignificant for individuals with a household income that belongs the highest tertile of the population. The higher a country's GDP per capita, the greater the probability that an individual is entrepreneurially active as an employee. The reverse holds for people being self-employed.

Robustness checks

Our robustness checks include the estimation of similar models, but (1) now using the World Bank and OECD indicators of severance pay and the notice period for workers at different years of tenure, and (2) preselecting 29 OECD countries.⁷ The question regarding the latter robustness check is whether the conclusions previously drawn also hold for a more homogeneous set of countries. The subsample that

⁷ In the latter case, we end up with one country less than the preselected number of countries, because of missing data on some of the included controls with the GEM 2011 APS as the data source.

results from this prior selection excludes all factor-driven economies, and most countries that qualify as efficiency-driven economies.⁸ By focusing on better developed countries only, our results are less influenced by necessity-based and/or informal forms of entrepreneurship, which are more prevalent in developing countries (see e.g. Acs, 2006).

Usually, employment protection is less strict for workers with less years of tenure, and so, any changes in the strictness of regulations affects them more than workers with more years of tenure. In that sense, one would expect severance pay and the notice period for workers with less years of tenure to be stronger determinants of the allocation over different occupations. Recall that the World Bank data allows for differentiation between workers with one year, five years, and ten years of tenure. The OECD in turn distinguishes between employment protection for employees working nine months, four years, and twenty years for their current employer. On average, the length of the notice period decreases with years of tenure going up in case of OECD data. Also, on average, severance pay is set highest for workers with four years tenure. For the sample of countries for which we have World Bank data we see that both severance pay and notice period are set stricter for people who work longer for their current employer.

The findings in table 5 reveal that the direction of the effects does not depend on differences in legislation for workers with different tenure lengths. Only small differences appear in the magnitude and significance of the various effects. For example, only severance payments for workers with a relatively short tenure length (one year or nine months) has a significantly negative effect on them being an entrepreneurial employee. Contrarily, the notice period for workers with more years of tenure has stronger significant effects on the probability that an individual is an entrepreneurial employee.

[INSERT TABLE 5 ABOUT HERE]

A prior selection of the 29 OECD countries fully confirms the previous findings as to the direction of the effects (see table 6). Obviously, our interest goes out to the first model, in which we use the World Bank

⁸ A prior selection of the 22 innovation-driven economies largely coincides with the preselected sample of OECD countries only, but additionally leaves out seven efficiency-driven OECD countries. The results of similar regression models using this even more restrictive sample show that, based on OECD data, severance pay is significantly negatively related to being self-employed. This actually is in line with hypothesis 2a, but contradicts our benchmark results in table 4.

indicators. Model 2 exactly replicates the second model in table 4. The effect of countries' average severance pay on being an entrepreneurial employee loses its (weak) significance. The three other coefficients of interest remain significant. Especially the notice period has a clear positive effect on someone being an entrepreneurial employee, and a clear negative effect on being self-employed. This is both in line with what we hypothesized.

[INSERT TABLE 6 ABOUT HERE]

All in all, we may conclude that our main results are fairly robust for using slightly different specifications of the model, and for preselecting a different group of countries. We find that two of EPL's main elements, i.e. severance pay and the notice period, have opposite effects on two types of entrepreneurial activity. A higher severance pay decreases the probability that an individual is active as an entrepreneurial employee, but increases his chances of being self-employed, and the reverse is true for a longer notice period. This holds for both a heterogeneous set of countries and a more homogeneous sample regarding their level of economic development.

6. Conclusions and discussion

The way the effects of EPL have been studied to date is largely unsatisfactory. Most research so far only focused on effects at the national level, such as changes in the employment level. Moreover, and despite EPL's complex nature, previous studies frequently used a composite index to determine its strictness. This study, however, focuses on two of its main elements separately, i.e. severance pay and the notice period, and finds opposing effects on the allocation of entrepreneurial individuals across established and newly established organizations. The higher the state-mandated severance payments from employer to employee after dismissal, the lower the probability that an individual will be an entrepreneurial employee, but the higher individual's chances to be self-employed. These results are, however, weakly significant regarding the effect on entrepreneurial employee activity, and not confirmed when using OECD data. The estimation results involving countries' average notice period do show highly significant coefficients, in the hypothesized directions, and for both World Bank and OECD data. That is, a longer notice period is positively related to individuals being entrepreneurially active as

an employee, and negatively related to self-employed individuals. The results are highly robust according to two checks.

The findings are remarkable in the sense that different elements of countries' EPL have opposite effects on the allocation of entrepreneurial activity. The results can therefore be seen as evidence against the use of composite indicators for EPL, which has been the standard in empirical research over the past decades. Different kinds of employment protection regulation might have contradictory effects, as is shown here. We are not the first to provide empirical evidence for opposite effects of severance payments and the notice period. Revised estimates of those of Lazear (1990) by Addison & Grosso (1996) only confirmed Lazear's findings as to the positive directional influence of severance pay on the employment level, but not to that of the notice period. This result and our own findings are puzzling, because at worst employers might treat the notice period as if it were severance pay by allowing employees not to be present during the entire notice period, while still paying their usual wage. So, one would expect the coefficients to at least have the same sign, and ideally with a less strong effect of the notice period. A somewhat speculative explanation for the opposite effects is that a notice period may encourage active job search (Addison & Blackburn, 1995), whereas severance payments might lead to workers delaying their job search. If so, then an extended notice period induces higher (re-)employment levels, ultimately leading to a higher number of entrepreneurial employees. As long as one receives severance payments, there is less or even no need to have a paid job again, thereby lowering the probability of being an entrepreneurially employee. A high severance payment may also be used as seed money to start up a new independent business, lowering liquidity constraints to become self-employed, explaining its positive relationship with self-employment (Evans & Jovanovic, 1989; Holtz-Eakin, Joulfaian & Rosen, 1994).

Policy implications

Policy recommendations regarding EPL should be formulated with care, because of its complex multi-dimensional nature. Labor market regulations are often hard to change, partly because of the path dependency involved in the way countries' legislation evolves over time, and the interdependencies with other types of regulations, for example with regard to capital and product markets (Amable, Demmou & Gatti, 2011; Fallick, Fleischman & Rebitzer, 2006). Even though our analyses are cross-country, they provide a starting point for implementing changes in EPL within a country (Boeri &

Gimeno, 2005). Policymakers might experiment with changing labor market regulations, or, more in particular, consider to adjust employers' obligations regarding severance payments and advance notice of contract termination in accordance with the results. That is, if policymakers aim to increase the number of individuals with entrepreneurial abilities to reveal these within established organizations, then the notice period should be set longer, while severance payments should be set less generous.

Limitations and future research

This study is not without limitations. First, it might be the case that strict EPL is embedded in a culture of uncertainty avoidance, as formal institutions are often interdependent on informal institutions (North, 1990; Williamson, 2000). In that sense, one may expect more people willing to become an employee, and some of them ultimately engaging in entrepreneurial employee activity, instead of becoming self-employed. In other words, there might be some endogeneity present in this study. Second, we use a cross-sectional data set, which implies that it is hard to exclude reverse causality. Ideally, we would have had a longitudinal data set covering more than the year 2011 only. Nonetheless, it is unlikely that causality runs from an individual's choice about where to be entrepreneurially active to country-level EPL, leaving our main conclusions unaltered. Third, severance pay and the notice period only capture part of a country's EPL. Even though these two provisions are among the most important elements of EPL, future research might consider the inclusion of various other regulations that are part of a country's legislation on employment protection. One can think of the maximum length of fixed-term contracts, whether or not redundancy dismissal is allowed by law, and whether or not third-party notification and/or approval are needed. Finally, there is a focus on employment protection legislated at the country level, because of the difficulty involved in obtaining information on privately or collectively negotiated contracts. This might be misleading though, for example in case of the Netherlands, where most employment protection regulations are laid down in collective agreements, on top of the prevailing national laws. Even though such regulations usually follow those set out in national-level legislation (Venn, 2009), future studies should take into account subnational heterogeneity in labor market regulations, such as sectoral- and regional-specific provisions (Autor, Kerr & Kugler, 2007).

References

- Acemoglu, D. (1995). Reward structures and the allocation of talent. *European Economic Review*, 39(1), 17-33.
- Acemoglu, D., & Angrist, J. (2001). Consequences of employment protection? The case of the Americans with Disabilities Act. *Journal of Political Economy*, 109(5), 915-957.
- Acemoglu, D., & Robinson, J. A. (2012). *Why nations fail: The origins of power, prosperity and poverty*. New York, NY: Crown Business.
- Acs, Z.J. (2006). How is entrepreneurship good for economic growth? *Innovations*, 1(1), 97-107.
- Addison, J.T., & Blackburn, M. (1995). Advance notice and job search: More on the value of an early start. *Industrial Relations: A Journal of Economy and Society*, 34(2), 242-262.
- Addison, J.T., & Grosso, J. (1996). Job security provisions and employment: Revised estimates. *Industrial Relations: A Journal of Economy and Society*, 35(4), 585-603.
- Addison, J.T., & Teixeira, P. (2003). The economics of employment protection. *Journal of Labor Research*, 24(1), 85-128.
- Amable, B., Demmou, L., & Gatti, D. (2011). The effect of employment protection and product market regulation on labour market performance: substitution or complementarity? *Applied Economics*, 43(4), 449-464.
- Amit, R., Muller, E., & Cockburn, I. (1995). Opportunity costs and entrepreneurial activity. *Journal of Business Venturing*, 10(2), 95-106.
- Antoncic, B., & Hisrich, R.D. (2001). Intrapreneurship: Construct refinement and cross-cultural validation. *Journal of Business Venturing*, 16(5), 495-527.
- Antoncic, B., & Hisrich, R.D. (2003). Clarifying the intrapreneurship concept. *Journal of Small Business and Enterprise Development*, 10(1), 7-18.
- Autor, D.H., Kerr, W.R., & Kugler, A.D. (2007). Does employment protection reduce productivity? Evidence from US states. *The Economic Journal*, 117(521), F189-F217.
- Baumann, F., & Brändle, T. (2012). Self-employment, educational attainment and employment protection legislation. *Labour Economics*, 19(6), 846-859.

- Baumol, W.J. (1990). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Political Economy*, 98(5), 893-921.
- Belot, M., Boone, J., & Van Ours, J. (2007). Welfare-improving employment protection. *Economica*, 74(295), 381-396.
- Bertola, G. (1990). Job security, employment and wage. *European Economic Review*, 34(4), 851-879.
- Bertola, G. (1992). Labor turnover costs and average labor demand. *Journal of Labor Economics*, 10(4), 389-411.
- Bertola, G., & Rogerson, R. (1997). Institutions and labor reallocation. *European Economic Review*, 41(6), 1147-1171.
- Bertola, G., Boeri, T., & Cazes, S. (2000). Employment protection in industrialized countries: The case for new indicators. *International Labour Review*, 139(1), 57-72.
- Bjørnskov, C., & Foss, N.J. (2016). Institutions, entrepreneurship, and economic growth: What do we know and what do we still need to know? *Academy of Management Perspectives*, 30(3), 292-315.
- Blanchard, O.J., & Tirole, J. (2008). The joint design of unemployment insurance and employment protection: A first pass. *Journal of the European Economic Association*, 6(1), 45-77.
- Boeri, T., & Gimeno, J.F. (2005). The effects of employment protection: Learning from variable enforcement. *European Economic Review*, 49(8), 2057-2077.
- Bosma, N., Stam, E., & Wennekers, S. (2013a). *Institutions and the allocation of entrepreneurship across new and established organizations*. EIM Research Reports No. H201213. Zoetermeer: EIM Business and Policy Research.
- Bosma, N., Wennekers, S., Guerrero, M., Amorós, J.E., Martiarena, A., & Singer, S. (2013b). *The Global Entrepreneurship Monitor. Special report on entrepreneurial employee activity*. London: Global Entrepreneurship Research Association (GERA).
- Cahuc, P., & Postel-Vinay, F. (2002). Temporary jobs, employment protection and labor market performance. *Labour Economics*, 9(1), 63-91.

- Chang, H. (2011). Institutions and economic development: Theory, policy and history. *Journal of Institutional Economics*, 7(4), 473-498.
- Evans, D.S., & Jovanovic, B. (1989). An estimated model of entrepreneurial choice under liquidity constraints. *Journal of Political Economy*, 97(4), 808-827.
- Fallick, B., Fleischman, C.A., & Rebitzer, J.B. (2006). Job-hopping in Silicon Valley: Some evidence concerning the microfoundations of a high-technology cluster. *Review of Economics and Statistics* 88(3), 472–481.
- Foss, N.J., & Lyngsie, J. (2014). The strategic organization of the entrepreneurial established firm. *Strategic Organization*, 12(3), 208-215.
- Holmlund, B. (2014). What do labor market institutions do? *Labour Economics*, 30, 62-69.
- Holtz-Eakin, D., Joulfaian, D., & Rosen, H.S. (1994). Entrepreneurial decisions and liquidity constraints. *The RAND Journal of Economics*, 25(2), 334-347.
- Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Kahn, L.M. (2007). The impact of employment protection mandates on demographic temporary employment patterns: International microeconomic evidence. *The Economic Journal*, 117(521), 333-356.
- Kahn, L.M. (2010). Employment protection reforms, employment and the incidence of temporary jobs in Europe: 1996-2001. *Labour Economics*, 17(1), 1-15.
- Kelley, D., Singer, S., & Herrington, M. (2016). *Global Entrepreneurship Monitor 2015/16 global report*. London: GERA.
- Knight, F.H. (1921). *Risk, uncertainty, and profit*. New York: August M. Kelley.
- Lazear, E.P. (1990). Job Security Provisions and Employment. *The Quarterly Journal of Economics*, 105(3), 699-726.
- Micco, A., & Pagés, C. (2006). *The economic effects of employment protection: Evidence from international industry-level data*. IZA Discussion Papers No. 2433. Bonn: Institute for the Study of Labor.

- Millán, A., Millán, J.M., Román, C., & Van Stel, A. (2013). How does employment protection legislation influence hiring and firing decisions by the smallest firms? *Economics Letters*, 121(3), 444-448.
- Murphy, K.M., Shleifer, A., & Vishny, R.W. (1991). The allocation of talent: Implications for growth. *The Quarterly Journal of Economics*, 106(2), 503-530.
- Nickell, S., & Layard, R. (1999). Labor market institutions and economic performance. *Handbook of Labor Economics*, 3, 3029-3084.
- Nicoletti, G., Scarpetta, S., & Boylaud, O. (1999). Summary indicators of product market regulation with an extension to employment protection legislation. Economics Department Working Papers 226. Paris: OECD.
- North, D.C. (1990). *Institutions, institutional change and economic performance*. New York: Cambridge University Press.
- OECD (2013). Protecting jobs, enhancing flexibility: A new look at employment protection legislation. In: OECD (eds). *OECD Employment Outlook 2013*. Paris: OECD.
- Parker, S.C. (2011). Intrapreneurship or entrepreneurship? *Journal of Business Venturing*, 26(1), 19-34
- Pissarides, C.A. (2001). Employment protection. *Labour Economics*, 8(2), 131-159.
- Robson, M.T. (2003). Does stricter employment protection legislation promote self-employment? *Small Business Economics*, 21(3), 309-319.
- Román, C., Congregado, E., & Millán, J.M. (2011). Dependent self-employment as a way to evade employment protection legislation. *Small Business Economics*, 37(3), 363-392.
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217-226.
- Skedinger, P. (2010). *Employment protection legislation: Evolution, effects, winners and losers*. Cheltenham, UK: Edward Elgar Publishing.
- Stam, E. (2013). Knowledge and entrepreneurial employees: A country-level analysis. *Small Business Economics*, 41(4), 887-898.

- Subramanian, N. (2005). The economics of intrapreneurial innovation. *Journal of Economic Behavior & Organization*, 58(4), 487-510.
- Torrini, R. (2005). Cross-country differences in self-employment rates: The role of institutions. *Labour Economics*, 12(5), 661-683.
- Venn, D. (2009). *Legislation, collective bargaining, and enforcement: Updating the OECD employment protection indicators*. OECD Social, Employment and Migration Working Papers No. 89. Paris: OECD.
- Williamson, O.E. (2000). The new institutional economics: Taking stock, looking ahead. *Journal of Economic Literature*, 38(3), 595-613.

Tables

Table 1 – Descriptive statistics of the dependent variable (*Occupational status*)

| Category | Frequency | Percent | Cumulative percent |
|--|-----------|---------|--------------------|
| <i>0. Non-entrepreneurial employee</i> | 61,501 | 67.1 | 67.1 |
| <i>1. Entrepreneurial employee</i> | 3,430 | 3.7 | 70.8 |
| <i>2. Self-employed</i> | 26,798 | 29.2 | 100,0 |
| Total | 91,729 | 100.0 | |

Table 2 – Descriptive statistics of the independent variables

| Variable | Observations | Mean | Std. Deviation | Minimum | Maximum |
|-----------------------------|---------------------|-------------|-----------------------|----------------|----------------|
| <i>Severance pay (WB)</i> | 90,007 | 12.401 | 8.429 | 0 | 31.667 |
| <i>Notice period (WB)</i> | 90,007 | 4.589 | 3.662 | 0 | 14.444 |
| <i>Severance pay (OECD)</i> | 60,054 | 1.936 | 1.412 | 0 | 6.000 |
| <i>Notice period (OECD)</i> | 60,054 | 1.970 | 1.174 | 0 | 5.667 |
| <i>Age:</i> | | | | | |
| - 18 – 24 years | 91,729 | 0.108 | 0.310 | 0 | 1 |
| - 25 – 34 years | 91,729 | 0.259 | 0.438 | 0 | 1 |
| - 35 – 44 years | 91,729 | 0.274 | 0.446 | 0 | 1 |
| - 45 – 54 years | 91,729 | 0.233 | 0.423 | 0 | 1 |
| - 55 – 64 years | 91,729 | 0.125 | 0.331 | 0 | 1 |
| <i>Male</i> | 91,711 | 0.560 | 0.496 | 0 | 1 |
| <i>Educational level:</i> | | | | | |
| - None | 90,767 | 0.068 | 0.252 | 0 | 1 |
| - Some secondary | 90,767 | 0.134 | 0.341 | 0 | 1 |
| - Secondary degree | 90,767 | 0.329 | 0.470 | 0 | 1 |
| - Post-secondary | 90,767 | 0.374 | 0.484 | 0 | 1 |
| - Graduate experience | 90,767 | 0.095 | 0.294 | 0 | 1 |
| <i>Household income:</i> | | | | | |
| - Missing/Cannot code | 91,729 | 0.173 | 0.378 | 0 | 1 |
| - Lowest tertile | 91,729 | 0.124 | 0.329 | 0 | 1 |
| - Middle tertile | 91,729 | 0.280 | 0.449 | 0 | 1 |
| - Highest tertile | 91,729 | 0.424 | 0.494 | 0 | 1 |
| <i>Log GDP per capita</i> | 88,126 | 9.558 | 0.730 | 6.854 | 10.578 |
| <i>Unemployment rate</i> | 90,447 | 9.903 | 5.797 | 0.7 | 27.6 |

Table 3 – Correlation coefficients

| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. |
|--------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|--------------|--------------|-------|
| 1. <i>Occupational status</i> | 1.000 | | | | | | | | | | |
| 2. <i>Severance pay (WB)</i> | 0.185 *** | 1.000 | | | | | | | | | |
| 3. <i>Notice period (WB)</i> | -0.168 *** | -0.281 *** | 1.000 | | | | | | | | |
| 4. <i>Severance pay (OECD)</i> | 0.055 *** | 0.743 *** | -0.142 *** | 1.000 | | | | | | | |
| 5. <i>Notice period (OECD)</i> | -0.045 *** | -0.195 *** | 0.636 *** | -0.180 *** | 1.000 | | | | | | |
| 6. <i>Age</i> * | 0.092 *** | -0.076 *** | 0.064 *** | -0.102 *** | 0.011 ** | 1.000 | | | | | |
| 7. <i>Male</i> | 0.067 *** | 0.037 *** | -0.041 *** | 0.008 * | -0.009 * | -0.022 *** | 1.000 | | | | |
| 8. <i>Educational level</i> ** | -0.134 *** | -0.192 *** | 0.039 *** | -0.157 *** | -0.036 *** | -0.058 *** | -0.066 *** | 1.000 | | | |
| 9. <i>Household income</i> ** | 0.013 *** | 0.031 *** | -0.022 *** | 0.014 ** | -0.034 *** | 0.011 ** | 0.077 *** | 0.278 *** | 1.000 | | |
| 10. <i>Log GDP per capita</i> | -0.194 *** | -0.575 *** | 0.199 *** | -0.594 *** | -0.089 *** | 0.143 *** | -0.061 *** | 0.194 *** | 0.027 *** | 1.000 | |
| 11. <i>Unemployment rate</i> | -0.002 | 0.095 *** | -0.287 *** | 0.314 *** | -0.352 *** | 0.064 *** | -0.018 *** | 0.027 *** | 0.083 *** | 0.214 *** | 1.000 |

Notes: Significance levels: ⁺ $0.05 < p \leq 0.10$; * $0.01 < p \leq 0.05$; ** $0.001 < p \leq 0.01$; *** $p \leq 0.001$; * Continuous variable; ** Ordered categorical variable.

Table 4 – Results of the multilevel mixed-effects multinomial logistic regression models

| | Model 1 (World Bank indicators) | | | | | | Model 2 (OECD indicators) | | | | | |
|-----------------------------|---------------------------------|---------|--------|------------------|---------|--------|-----------------------------|---------|--------|------------------|---------|--------|
| | 1. Entrepreneurial employee | | | 2. Self-employed | | | 1. Entrepreneurial employee | | | 2. Self-employed | | |
| | Coef | Std err | Signif | Coef | Std err | Signif | Coef | Std err | Signif | Coef | Std err | Signif |
| <i>Severance pay (WB)</i> | -0.160 | 0.089 | + | 0.176 | 0.085 | * | | | | | | |
| <i>Notice period (WB)</i> | 0.149 | 0.059 | * | -0.258 | 0.057 | *** | | | | | | |
| <i>Severance pay (OECD)</i> | | | | | | | -0.052 | 0.142 | | -0.175 | 0.138 | |
| <i>Notice period (OECD)</i> | | | | | | | 0.256 | 0.096 | ** | -0.163 | 0.095 | + |
| <i>Age:</i> | | | | | | | | | | | | |
| - 25 – 34 years | 0.255 | 0.041 | *** | 0.077 | 0.013 | *** | 0.286 | 0.050 | *** | 0.123 | 0.018 | *** |
| - 35 – 44 years | 0.369 | 0.041 | *** | 0.205 | 0.013 | *** | 0.431 | 0.050 | *** | 0.269 | 0.018 | *** |
| - 45 – 54 years | 0.327 | 0.040 | *** | 0.259 | 0.013 | *** | 0.403 | 0.048 | *** | 0.323 | 0.018 | *** |
| - 55 – 64 years | 0.237 | 0.034 | *** | 0.312 | 0.011 | *** | 0.277 | 0.040 | *** | 0.352 | 0.015 | *** |
| <i>Male</i> | 0.204 | 0.019 | *** | 0.135 | 0.008 | *** | 0.214 | 0.021 | *** | 0.207 | 0.010 | *** |
| <i>Educational level:</i> | | | | | | | | | | | | |
| - Some secondary | 0.220 | 0.074 | ** | -0.050 | 0.012 | *** | 0.250 | 0.098 | ** | -0.028 | 0.017 | |
| - Secondary degree | 0.467 | 0.095 | *** | -0.152 | 0.016 | *** | 0.544 | 0.129 | *** | -0.119 | 0.022 | *** |
| - Post-secondary | 0.889 | 0.097 | *** | -0.281 | 0.017 | *** | 0.950 | 0.132 | *** | -0.190 | 0.023 | *** |
| - Graduate experience | 0.630 | 0.059 | *** | -0.146 | 0.013 | *** | 0.674 | 0.080 | *** | -0.094 | 0.016 | *** |
| <i>Household income:</i> | | | | | | | | | | | | |
| - Middle tertile | 0.162 | 0.044 | *** | -0.082 | 0.013 | *** | 0.163 | 0.049 | *** | -0.104 | 0.016 | *** |
| - Highest tertile | 0.556 | 0.045 | *** | -0.015 | 0.014 | | 0.584 | 0.050 | *** | -0.004 | 0.016 | |
| <i>Log GDP per capita</i> | 0.239 | 0.088 | ** | -0.261 | 0.084 | ** | 0.529 | 0.159 | *** | -0.568 | 0.152 | *** |
| <i>Unemployment rate</i> | 0.039 | 0.086 | | -0.046 | 0.083 | | -0.021 | 0.103 | | 0.123 | 0.100 | |

| | | | | | | | | | | | | |
|-----------------------|--------|-------|---------------|--------|-------|-----|--------|-------|-----|---------------|-------|-----|
| <i>Constant</i> | -3.392 | 0.076 | *** | -0.921 | 0.071 | *** | -3.540 | 0.076 | *** | -0.886 | 0.064 | *** |
| Model summary | | | | | | | | | | | | |
| Number of individuals | | | 85,470 | | | | | | | 59,412 | | |
| Number of countries | | | 46 | | | | | | | 28 | | |
| Log likelihood | | | -57,231.773 | | | | | | | -39,378.003 | | |
| Deviance | | | 114,463.546 | | | | | | | 78,756.006 | | |
| σ_{u0}^2 | | | 0.264 (0.053) | | | | | | | 0.312 (0.030) | | |

Notes: Base outcome: 0. Non-entrepreneurial employee; In case of *Household income* missing values included, but not reported here; Standardized variables; Robust standard errors for clustered data; Significance levels: + 0.05< p ≤ 0.10; * 0.01< p ≤ 0.05; ** 0.001< p ≤ 0.01; *** p ≤ 0.001.

Table 5 – Results of robustness check 1: Legislation for workers with different years of tenure

| | Model 1 (World Bank indicators) | | | | | | Model 2 (OECD indicators) | | | | | |
|---------------------------------|---------------------------------|---------|--------|------------------|---------|--------|-----------------------------|---------|--------|------------------|---------|--------|
| | 1. Entrepreneurial employee | | | 2. Self-employed | | | 1. Entrepreneurial employee | | | 2. Self-employed | | |
| | Coef | Std err | Signif | Coef | Std err | Signif | Coef | Std err | Signif | Coef | Std err | Signif |
| <i>Severance pay 1y (WB)</i> | -0.177 | 0.058 | ** | 0.112 | 0.051 | * | | | | | | |
| <i>Notice period 1y (WB)</i> | 0.021 | 0.082 | | -0.267 | 0.079 | *** | | | | | | |
| <i>Severance pay 9m (OECD)</i> | | | | | | | -0.115 | 0.065 | + | -0.219 | 0.059 | *** |
| <i>Notice period 9m (OECD)</i> | | | | | | | 0.196 | 0.058 | *** | -0.137 | 0.056 | * |
| | Model 3 (World Bank indicators) | | | | | | Model 4 (OECD indicators) | | | | | |
| | 1. Entrepreneurial employee | | | 2. Self-employed | | | 1. Entrepreneurial employee | | | 2. Self-employed | | |
| | Coef | Std err | Signif | Coef | Std err | Signif | Coef | Std err | Signif | Coef | Std err | Signif |
| <i>Severance pay 5y (WB)</i> | -0.139 | 0.088 | | 0.186 | 0.085 | * | | | | | | |
| <i>Notice period 5y (WB)</i> | 0.145 | 0.074 | * | -0.239 | 0.072 | *** | | | | | | |
| <i>Severance pay 4y (OECD)</i> | | | | | | | -0.086 | 0.092 | | -0.088 | 0.086 | |
| <i>Notice period 4y (OECD)</i> | | | | | | | 0.241 | 0.074 | *** | -0.126 | 0.073 | + |
| | Model 5 (World Bank indicators) | | | | | | Model 6 (OECD indicators) | | | | | |
| | 1. Entrepreneurial employee | | | 2. Self-employed | | | 1. Entrepreneurial employee | | | 2. Self-employed | | |
| | Coef | Std err | Signif | Coef | Std err | Signif | Coef | Std err | Signif | Coef | Std err | Signif |
| <i>Severance pay 10y (WB)</i> | -0.111 | 0.095 | | 0.178 | 0.092 | + | | | | | | |
| <i>Notice period 10y (WB)</i> | 0.189 | 0.084 | * | -0.234 | 0.083 | ** | | | | | | |
| <i>Severance pay 20y (OECD)</i> | | | | | | | 0.113 | 0.097 | | -0.079 | 0.093 | |
| <i>Notice period 20y (OECD)</i> | | | | | | | 0.260 | 0.095 | ** | -0.141 | 0.094 | |
| Control variables | | | | | | | | | | | | |
| Included? | | | | Yes | | | | | | Yes | | |
| Models summary | | | | | | | | | | | | |
| Number of individuals | | | | 85,470 | | | | | | 59,412 | | |
| Number of countries | | | | 46 | | | | | | 28 | | |

Notes: Base outcome: 0. Non-entrepreneurial employee; Standardized variables; Robust standard errors for clustered data; Significance levels: ⁺ 0.05$p\leq 0.10$; * 0.01$p\leq 0.05$; ** 0.001$p\leq 0.01$; ***

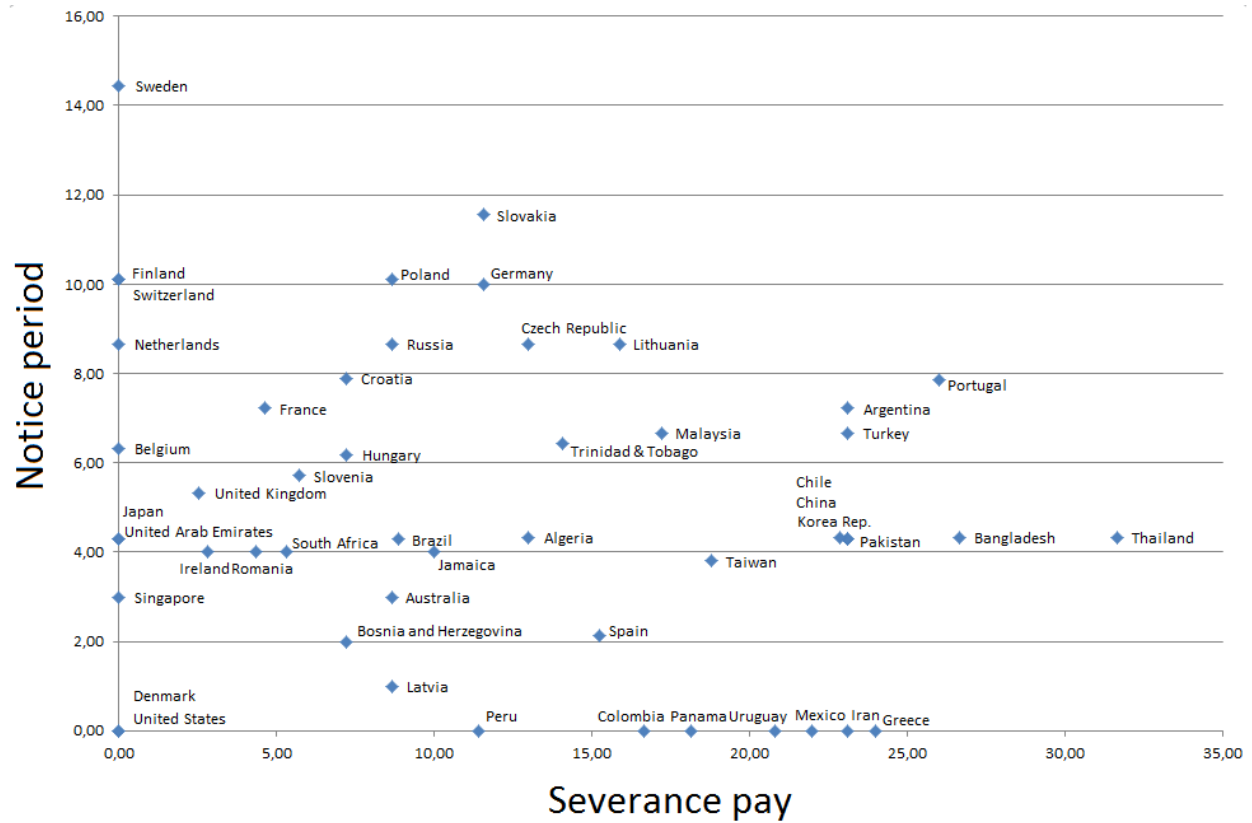
Table 6 – Results of robustness check 2: OECD countries only

| | Model 1 (World Bank indicators) | | | | | | Model 2 (OECD indicators) | | | | | |
|-----------------------------|---------------------------------|---------|--------|------------------|---------|--------|-----------------------------|---------|--------|------------------|---------|--------|
| | 1. Entrepreneurial employee | | | 2. Self-employed | | | 1. Entrepreneurial employee | | | 2. Self-employed | | |
| | Coef | Std err | Signif | Coef | Std err | Signif | Coef | Std err | Signif | Coef | Std err | Signif |
| <i>Severance pay (WB)</i> | -0.029 | 0.084 | | 0.197 | 0.078 | * | | | | | | |
| <i>Notice period (WB)</i> | 0.218 | 0.058 | *** | -0.202 | 0.056 | *** | | | | | | |
| <i>Severance pay (OECD)</i> | | | | | | | -0.052 | 0.142 | | -0.175 | 0.138 | |
| <i>Notice period (OECD)</i> | | | | | | | 0.256 | 0.096 | ** | -0.163 | 0.095 | + |
| Control variables | | | | | | | | | | | | |
| Included? | | | | Yes | | | | | | Yes | | |
| Model summary | | | | | | | | | | | | |
| Number of individuals | | | | 59,412 | | | | | | 59,412 | | |
| Number of countries | | | | 28 | | | | | | 28 | | |
| Log likelihood | | | | -39,353.772 | | | | | | -39,378.003 | | |
| Deviance | | | | 78,707.544 | | | | | | 78,756.006 | | |
| σ_{u0}^2 | | | | 0.309 (0.036) | | | | | | 0.312 (0.030) | | |

Notes: Base outcome: 0. Non-entrepreneurial employee; Standardized variables; Robust standard errors for clustered data; Significance levels: + 0.05< p ≤ 0.10; * 0.01< p ≤ 0.05; ** 0.001< p ≤ 0.01; *** p ≤ 0.001.

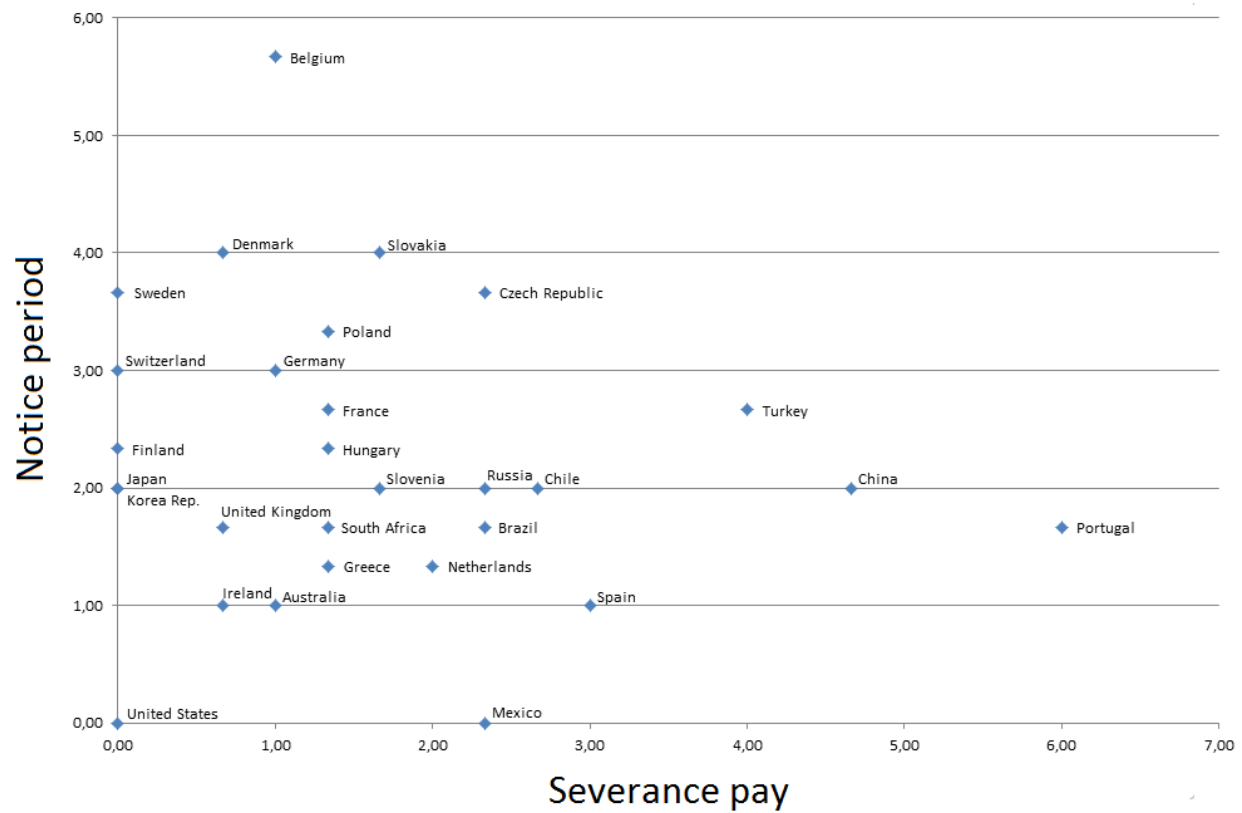
Figures

Figure 1 – Countries' severance pay and notice period in weeks (World Bank; N=50)



Notes: Data on national-level legislation. Severance pay and the notice period may be different in collectively and/or privately negotiated agreements.

Figure 2 – Countries' severance pay and notice period in months (OECD; N=29)



Notes: Data on national-level legislation. Severance pay and the notice period may be different in collectively and/or privately negotiated agreements.

Figure 3 – Severance pay in weeks (World Bank; N=50)

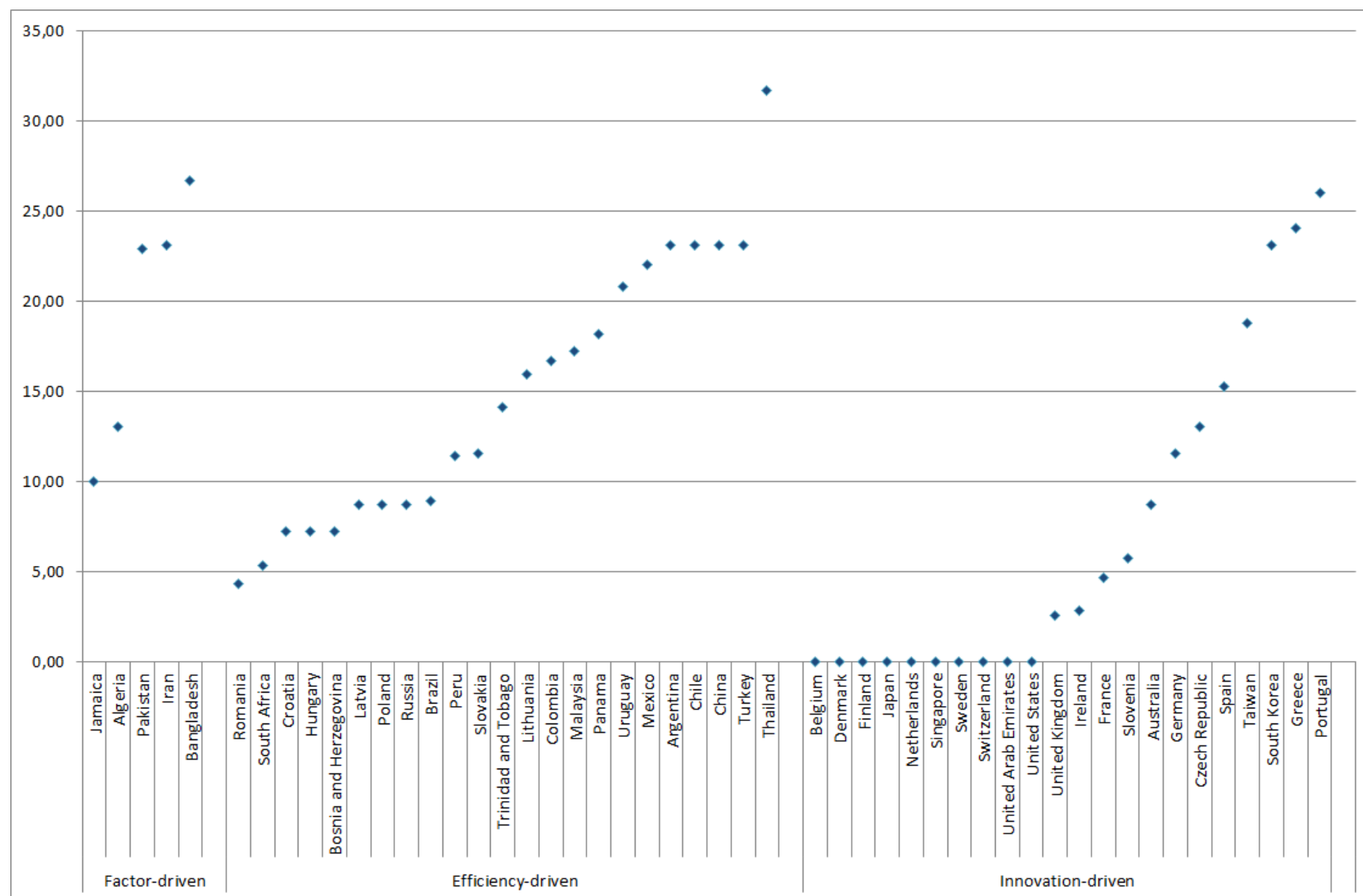


Figure 4 – Notice period in weeks (World Bank; N=50)

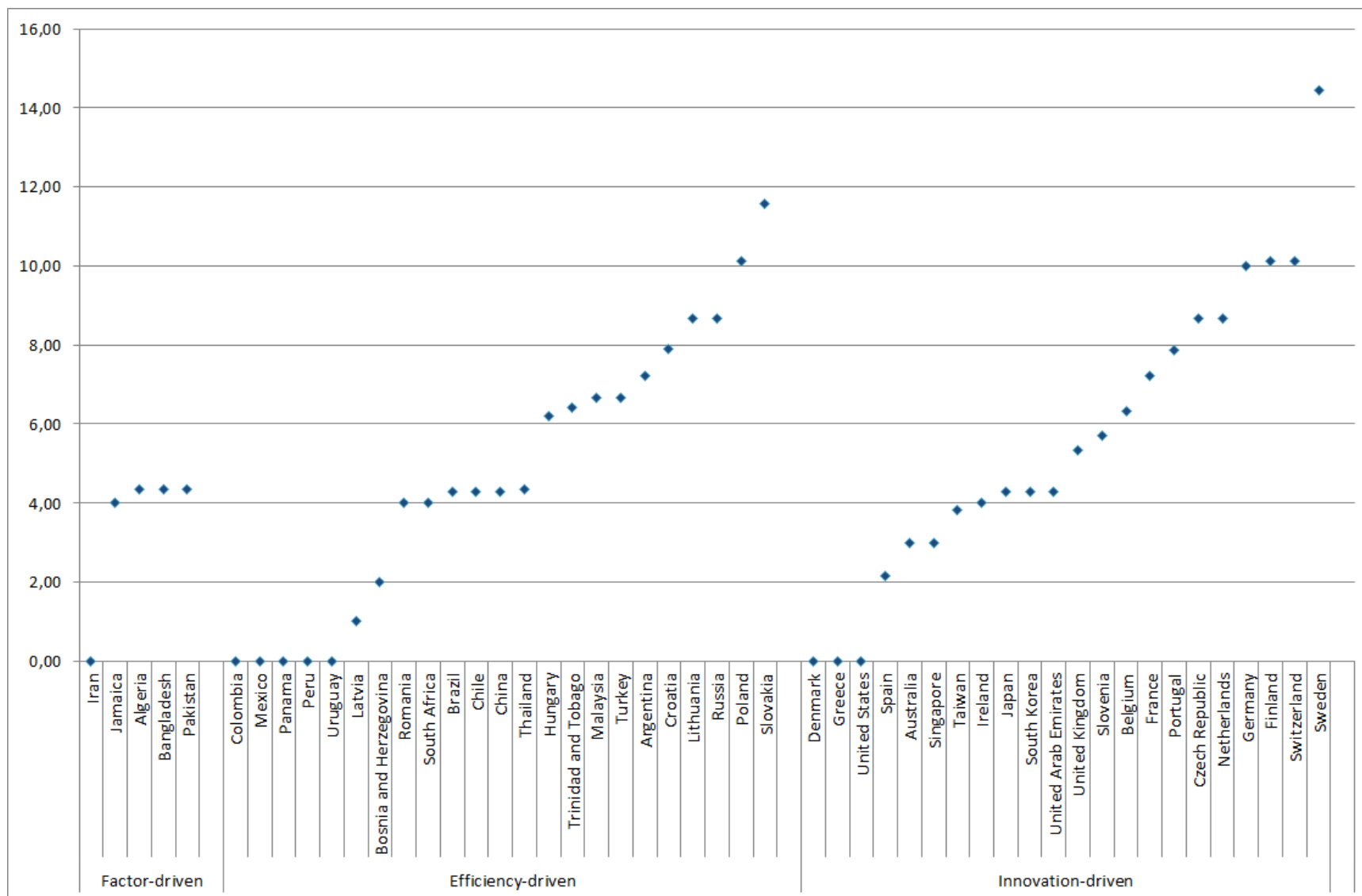


Figure 5 – Severance pay in months (OECD; N=29)

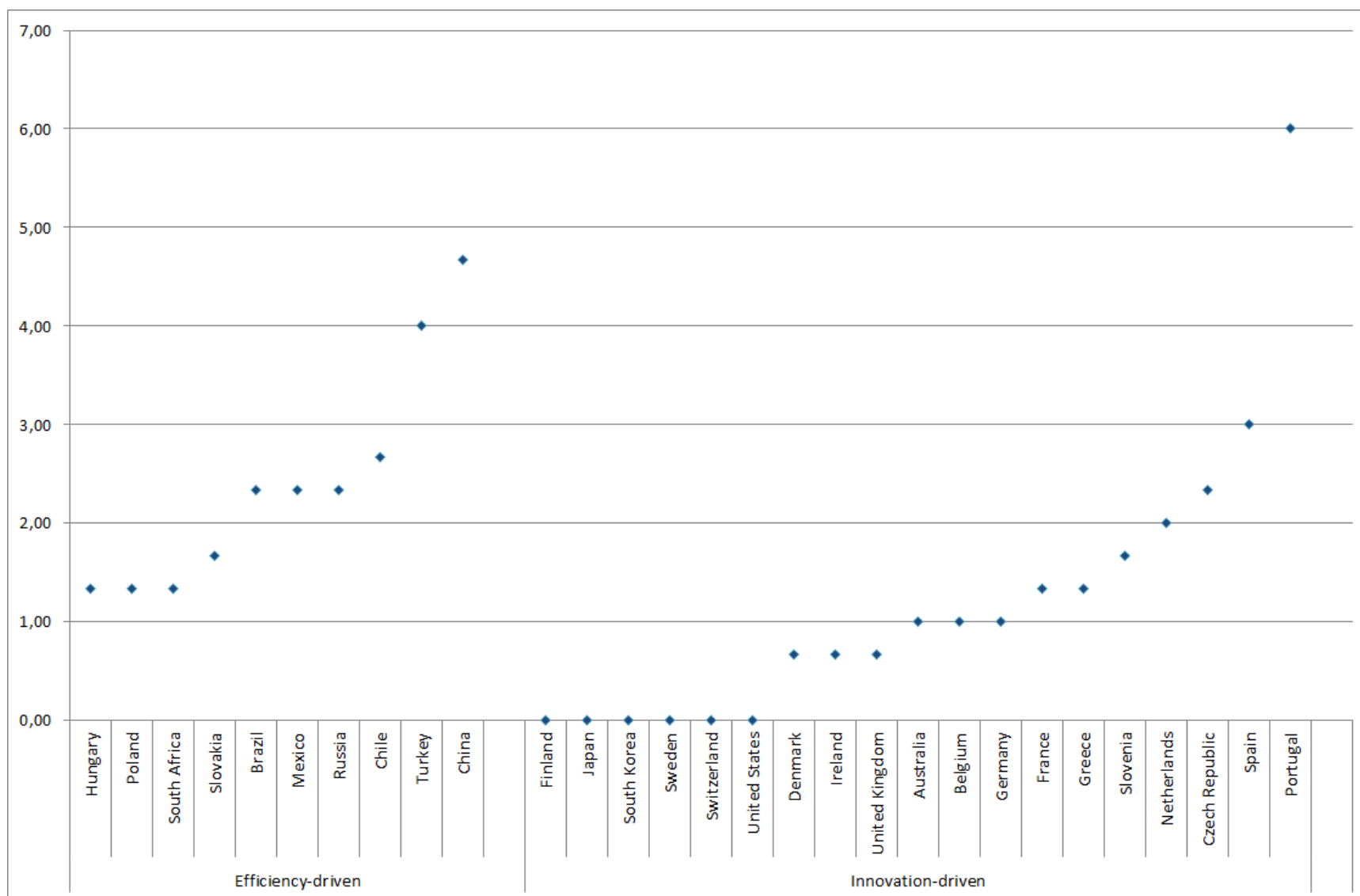


Figure 6 – Notice period in months (OECD; N=29)

