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

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# Employment protection and entrepreneurship. Unpacking the effects of employment protection legislation on the allocation of entrepreneurial activity in society

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September 2016

## Abstract

Labor market institutions enable and constrain particular behaviors on the labor market and beyond. We take a closer look on employment protection legislation (EPL), and its unintended effects on entrepreneurial activity. We unpack the effects of EPL by disentangling the two mechanisms of the severance pay and notice period, and analyze the effects of these mechanisms on the allocation of entrepreneurial activity across employment and self-employment. This study uses multilevel analyses to examine the separate effect of the two main elements of EPL on an individual's occupational status. In general, the severance pay is found to be negatively related to entrepreneurial employees, whereas the notice period shows a positive relationship. The opposite is true for the effects on self-employed individuals.

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

**JEL classification:** H55; J65; L26; M13; O43; O57

## Acknowledgements

This research is partly financed by the Enabling Technology Program (ETP) Behavior 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.

## 1. Introduction

Institutions, the man-made rules of the game in society, have wide ranging intended and unintended effects on economic action and ultimately economic development (Acemoglu & Robinson, 2012; North, 1990). More in particular, institutions define the relative rewards that different occupations receive, and are a key factor 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 in recent decades (see e.g. Holmlund, 2014). Labor market institutions are usually thought of as policy interventions or collective organizations that interfere with wage and employment determination, and perhaps unintendedly with occupational choices as well. One particular, often discussed type of labor market institution 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.

During the second half of the twentieth century, many European countries enacted laws on employment protection. The standard argument in favor of such laws is that they protect 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. 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; employees willing to become self-employed have to give up their legal rights as an employee, and will think twice before they choose to become self-employed. However, when we specifically think about workers with entrepreneurial abilities, they might also choose to become entrepreneurially active within established organizations. Shane & Venkataraman (2000) define entrepreneurship as the discovery, evaluation and exploitation of opportunities to create future goods and services by individuals. They hereby deliberately talk about individuals in general, and do not limit entrepreneurship to those who set up an independent business or own a new business for own risk and reward (Jensen & Meckling, 1976; Knight, 1921). Evidence shows that more developed economies have higher prevalence rates of entrepreneurial activity by employees than less developed countries, and the opposite is true for independent entrepreneurial activity (Bosma, Stam & Wennekers, 2013a). Therefore, labor mobility across employment and self-employment, especially by workers with entrepreneurial abilities, is likely

to be affected by EPL. In other words, EPL is expected to affect the allocation of entrepreneurial activity across established and newly established organizations in a country.

This study examines whether the strictness of a country's EPL has an effect on an individual's occupational status, which may be either employed or self-employed. The category of employed in turn includes both employees undertaking entrepreneurial activities for their employer, also referred to as entrepreneurial employee activity (EEA), and other employees, who do not qualify as entrepreneurial employees. Multilevel analyses are used to unravel country-level and individual-level determinants of an individual's occupational status. We unpack the effects of EPL by disentangling the mechanisms of two of its main elements, the severance pay and notice period.

This study has a threefold contribution to the extant literature. First and foremost, we investigate the effects of EPL on individual-level occupational status, whereas most studies so far focused on macro effects, such as changes in unemployment, employment and self-employment levels (Lazear, 1990; Kahn, 2010; Robson, 2003). Second, entrepreneurial employees are only recently acknowledged as a separate category of entrepreneurially active individuals (Stam, 2013). As such, we are able to take a closer look at the allocation of entrepreneurial activity across employed and self-employed individuals. Third, we estimate the separate effects of the two main elements of EPL, i.e. the severance pay and the notice period. 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.

All regression models are multilevel in nature due to the inclusion of explanatory variables at different levels of analysis. For the dependent variable we use data of the Global Entrepreneurship Monitor (GEM), and we use data from the World Bank (WB) and the Organisation for Economic Co-operation and Development (OECD) on the severance pay and notice period, as laid down in national-level legislation of large and heterogeneous groups of countries.

## **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. It are the relative pay-offs to different occupations that play a key role the allocation of talent in society (Acemoglu, 1995; Baumol, 1990; Murphy et al., 1991).

EPL is 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." Thus, employment protection not only consists of provisions set out in country-level legislation, but it also includes regulations at lower levels. 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. 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 contract – whereas the other three categories essentially seem to be 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.

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 (for similar reasons, a negative effect on unemployment levels simultaneously). 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.

However, 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 the 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 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 and did not take into account entrepreneurial employee activity (EEA) within existing firms (often also referred to as intrapreneurship). Bosma et al. (2013a) find that the prevalence of EEA and independent (early-stage) entrepreneurial activity (IEA) at the macro level seem to have an inversed relationship. This suggests that to some extent these two modes of entrepreneurial activity are substitutes rather than correlates. Bosma et al. (2013a) also conclude that both formal and informal institutions in general affect the allocation of entrepreneurial activity. More specifically, they expect social security favoring employment over self-employment positively to affect the share of entrepreneurial employees in a country. Likewise, we investigate two main elements of the formal institution employment protection, the severance pay and the notice period, which both favor employment over self-employment. Within the category of employed individuals we further distinguish between entrepreneurial employees and those who do not qualify as such. Someone is seen as an entrepreneurial employee if he is continuously involved in the development of new business activities for his main employer, such as the establishment of a new outlet or subsidiary, and when he has a leading role in the phase of idea development and/or the phase of preparation and implementation (Bosma et al., 2013b).

The opportunity costs of self-employment obviously increase with stricter requirements regarding the dismissal of workers. 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.

The competitive equilibrium theory of the firm under uncertainty by Kihlstrom & Laffont (1979) assumes that an individual supplies labor, either as an employee in a competitive labor market or as an entrepreneur that runs his own business. The former would give them a riskless wage, whereas the latter would be a risky endeavor. In short, the model by Kihlstrom & Laffont (1979) shows that less risk-averse individuals become entrepreneurs, and more risk-averse individuals will become employees. However, the allocation across employment and self-employment depends on many more factors than risk-aversion, for example how much social security favors employees over self-employed individuals. Moreover, Kihlstrom & Laffont (1979) ignore the possibility for individuals to be entrepreneurially active as an employee. They rather consider employees as a homogeneous group of individuals with regard to the degree to which they are entrepreneurially active. Within the group of employees, we do distinguish between entrepreneurial employees and those employees, who do not qualify as being entrepreneurially active.

From a worker's perspective, the increased opportunity costs of self-employment due to stricter EPL negatively influence the likelihood that people will be self-employed. Focusing solely on entrepreneurial individuals, we thus expect a higher chance of being entrepreneurially active as an employee. We therefore hypothesize that both the severance pay and notice period, as the two main elements of a country's legal system concerning employment protection, are positively related to entrepreneurially active employees. This leads to the following hypotheses:

*Hypothesis 1a: Country-level legislation on the 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 dimensions 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 the 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.*

We have no reason to expect opposite effects of the severance pay and notice period, because they are both part of legislation on employment protection that lead to better protected employees if set stricter. Nonetheless, we investigate their separate effects, because, in line with an increasing number of studies, we feel that one-dimensional indicators of EPL are not sufficiently able to capture the full story.

### **3. Data**

The data comes from a variety of sources with the GEM as 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 EEA as a special topic. 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 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.

Other data sources are the World Bank and the OECD. These two organizations both gather data about countries' EPL, and thus serve as a source for information on countries' legal height of the severance pay and length of the notice period. 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.

### *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 activities for their main employer in the past three years, and have had a leading role in at 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 the more narrow definition of EEA. 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 EEA than less well-developed economies (Bosma et al., 2013b). Other stylized facts show that to a certain extent EEA is a substitute of independent entrepreneurial activity, since in general, the share of EEA in overall entrepreneurial activity in society declines with the level of independent entrepreneurial activity (Bosma et al., 2013a).

The dependent variable is a self-constructed 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 EEA according to 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'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 the 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 the severance pay and notice period for workers at different years of tenure.

The OECD 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 the 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 also in this case we mainly focus on the averages for workers at different years of tenure.

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 the severance pay and notice period are among a country's most important

provisions relating to employment protection. Moreover, in most countries, severance pay and notice periods in collective agreements are 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 countries' 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 control variable when predicting an individual's occupational choice. As mentioned before, countries in a higher stage of economic development typically have higher prevalence rates of EEA (Bosma et al., 2013b). 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.

### *Descriptives of 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' average severance pay on the horizontal axis and average notice period on the vertical axis – according to World Bank and OECD data, respectively – and show a lot of dispersion. Hence, there is no clear relationship between the strictness of the severance pay and notice period within countries. At best, you can say that there is a weak negative relationship between the severance pay and notice period within the sample of OECD countries.

[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 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.

[INSERT FIGURE 3 ABOUT HERE]

[INSERT FIGURE 4 ABOUT HERE]

[INSERT FIGURE 5 ABOUT HERE]

[INSERT FIGURE 6 ABOUT HERE]

#### 4. Methodology

Both EEA 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. 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 indeed has a hierarchical data structure; it includes variables on the individual as well as the national level. Traditional approaches to deal with hierarchical data include 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 average severance pay and notice period for workers with different years of tenure, and hence,  $p = 1, \dots, 12$  and  $q = 1, \dots, 4$ .<sup>3</sup> Due to the specific form of the dependent variable (i.e. unordered categorical), we estimate so-called multilevel mixed-effects multinomial logistic regression models.

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<sup>3</sup> Hence, potentially the model contains 48 cross-level interaction terms, but in the analysis we limit ourselves to cross-level interactions that are interesting given the theoretical framework and previous research.

## 5. Results

### *Correlation coefficients*

The correlation coefficients between the dependent variable, the independent variables of interest, and the control variables, given in table 3, already provide us with some insights in their relationships.

[INSERT TABLE 3 ABOUT HERE]

Both World Bank indicators correlate significantly with *Occupational status*, but surprisingly, in opposite directions. The severance pay appears to be positively correlated with an individual's occupational status, whilst the notice period is negatively related. The magnitude of the coefficients is relatively low. A correlation between the dependent variable and the two OECD indicators is virtually absent. In case of both World Bank and OECD data, the severance pay and notice period are significantly and negatively correlated. So, on average, the higher the severance pay, 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 (Lazear, 1990).

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 the severance pay is 0.743, and highly significant. This strengthens our confidence in that both data sources assess the strictness of a country's EPL in a fairly similar way, and thereby our confidence in the comparability of the variables.

Other correlation coefficients that are worth mentioning are those between the log GDP per capita and the severance pay, 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.<sup>4</sup> Both models contain all aforementioned control variables. We have also run models in which we test the effects of the severance pay and the notice period variables separately, and their results do not deviate from what is discussed next as to the direction and significance of the effects.<sup>5</sup>

[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, the severance pay is found to be negatively associated with 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

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<sup>4</sup> 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.

<sup>5</sup> 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 the 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 the 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. The contradictory effects remain remarkable though, and the use of one-dimensional measures of EPL in future research should be reconsidered.

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 beneficial for being an entrepreneurial employee. Both controls are negatively related to self-employment, however 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 the severance pay and notice period for workers at different years of tenure, (2)

preselecting 29 OECD countries, and (3) preselecting the 22 innovation-driven economies.<sup>6</sup> The question regarding the latter two robustness checks is whether the conclusions previously drawn also hold for certain, more homogeneous sets of countries. The subsamples that result from these prior selections largely coincide, but the sample of OECD countries also includes a few countries that qualify as efficiency-driven economies. Hence, the sample with innovation-driven economies is an even more restrictive set of countries with regard to their economic development.

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 the severance pay and notice period for workers with less years of tenure to be stronger determinants of the allocation across different occupations. Recall that the World Bank data allows for differentiation between workers with 1 year, 5 years and 10 years of tenure. The OECD in turn distinguishes between employment protection for employees working 9 months, 4 years and 20 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, the severance pay is set highest for workers with 4 years tenure. For the sample of countries for which we have World Bank data we see that both the 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 the severance pay for workers with a relatively short tenure length (1 year or 9 months) has a significantly negative effect on them being an entrepreneurial employee. Contrarily, the notice period for workers with more years 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

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<sup>6</sup> In the latter two cases, we end up with somewhat 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.

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]

The findings are also fairly similar for the group of innovation-driven economies only (see table 7). It only appears that, based on OECD data, the severance pay is significantly negatively related to self-employment. This actually is in line with hypothesis 2a. Remarkable is the fact that the World Bank indicator of countries' average severance pay at the same time shows a significantly positive relationship with being self-employed. In most cases, the effects are more significant as compared to the benchmark results in table 4, but especially in case of the OECD indicator for the notice period. Hence, the longer the notice period, the higher the probability of someone being an entrepreneurial employee, and the lower the probability of being self-employed, as hypothesized, and these effects are more significant in a set of countries excluding less developed countries.

[INSERT TABLE 7 ABOUT HERE]

All in all, we can conclude that our main results are fairly robust for using slightly different specifications of the model, and for preselecting different groups of countries. We find that two of EPL's main elements, the severance pay and 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 more homogeneous samples regarding their 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. the severance pay and notice period, and finds opposing effects on the allocation of entrepreneurially active individuals over established and newly established organizations. The higher the state-mandated severance payments from employer to employee after a dismissal, the lower the probability that somebody will be an entrepreneurial employee, but the higher somebody's chances to be self-employed. These results are however somewhat weakly significant and not confirmed when using OECD data. The estimation results involving countries' average notice period do show highly significant coefficients, and in the hypothesized direction. 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 fairly robust according to three checks. For example, the prior selection of subsets of countries almost fully confirms the findings as to the direction of the effects.

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 so far is a common thing to do in empirical research. Different kinds of employment protection regulations might have contradictory effects, as is shown here. We are not the first to provide empirical evidence for opposite effects of the severance pay and 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 the 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 even be used as some sort of seed money to start up a new independent business, explaining its positive relationship with self-employment.

### *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). Nevertheless, policymakers might experiment with changing labor market regulations, or, more in particular, consider to adjust employers' obligations regarding the severance pay and notice period 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 the severance pay should become less generous, and vice versa.

### *Limitations and future research*

This study is not without limitations, which are discussed here. First, it might be the case that strict EPL is embedded in a culture of certainty. In that sense, one may expect more people willing to become an employee, and some of them ultimately engaging in EEA, 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, the severance pay and 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 (often at the regional or sectoral level). 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. However, these regulations usually follow those set out in national-level legislation.

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## Tables

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

<b>Category</b>	<b>Frequency</b>	<b>Percent</b>	<b>Cumulative percent</b>
<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
<b>Total</b>	91,729	100.0	

**Table 2 – Descriptive statistics of the independent variables**

<b>Variable</b>	<b>Observations</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
<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>					
- 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
- Missing/Cannot code	91,729	0.173	0.378	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<sup>1</sup>**

	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

<sup>1</sup>Significance levels: + 0.05<p≤0.10; \* 0,01<p≤0,05; \*\* 0,001<p≤0,01; \*\*\* p≤0,001; \* Continuous variable; \*\* Ordered categorical variable.

**Table 4 – Results of the multilevel mixed-effects multinomial logistic regression models<sup>2</sup>**

	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>												
- <i>Some secondary</i>	0.220	0.074	**	-0.050	0.012	***	0.250	0.098	**	-0.028	0.017	
- <i>Secondary degree</i>	0.467	0.095	***	-0.152	0.016	***	0.544	0.129	***	-0.119	0.022	***
- <i>Post-secondary</i>	0.889	0.097	***	-0.281	0.017	***	0.950	0.132	***	-0.190	0.023	***
- <i>Graduate experience</i>	0.630	0.059	***	-0.146	0.013	***	0.674	0.080	***	-0.094	0.016	***
<i>Household income:</i>												
- <i>Middle tertile</i>	0.162	0.044	***	-0.082	0.013	***	0.163	0.049	***	-0.104	0.016	***
- <i>Highest tertile</i>	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	***
<b>Model summary</b>												
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					
$\sigma_{u0}^2$	0.264 (0.053)						0.312 (0.030)					

<sup>2</sup> 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: <sup>+</sup> 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<sup>3</sup>**

	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)					
<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)					
<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	
<b>Control variables</b>												
Included?	Yes						Yes					
<b>Models summary</b>												
Number of individuals	85,470						59,412					
Number of countries	46						28					

<sup>3</sup> 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.

**Table 6 – Results of robustness check 2: OECD countries only<sup>4</sup>**

	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	+
<b>Control variables</b>												
Included?	Yes						Yes					
<b>Model summary</b>												
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					
$\sigma_{u0}^2$	0.309 (0.036)						0.312 (0.030)					

<sup>4</sup> 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.

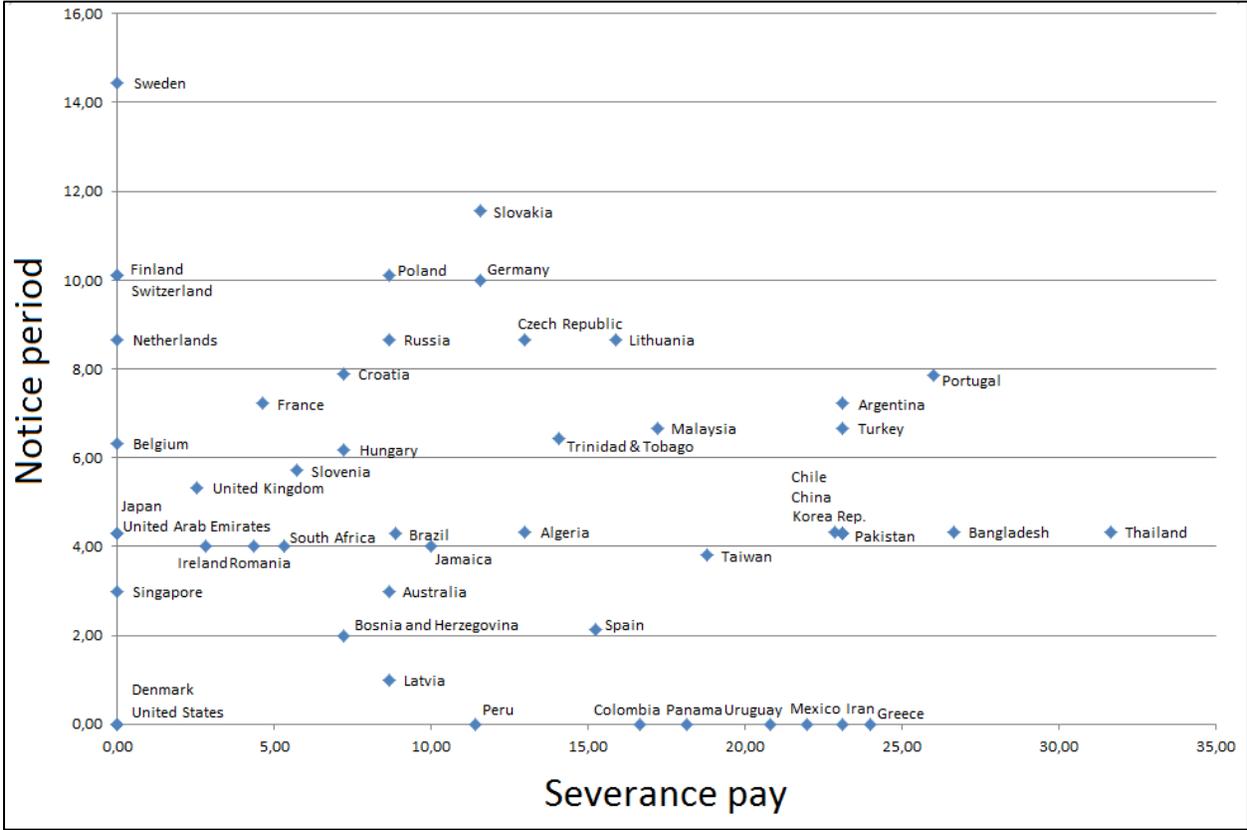
**Table 7 – Results of robustness check 3: Innovation-driven economies only<sup>5</sup>**

	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>	-0.068	0.121		0.267	0.115	*						
<i>Notice period (WB)</i>	0.240	0.082	**	-0.173	0.079	*						
<i>Severance pay (OECD)</i>							-0.098	0.087		-0.219	0.082	**
<i>Notice period (OECD)</i>							0.189	0.047	***	-0.238	0.045	***
<b>Control variables</b>												
Included?	Yes						Yes					
<b>Model summary</b>												
Number of individuals	39,446						39,446					
Number of countries	19						19					
Log likelihood	-26,705.725						-26,732.509					
Deviance	53,411.450						53,465.018					
$\sigma_{u0}^2$	0.096 (0.032)						0.114 (0.029)					

<sup>5</sup> 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.

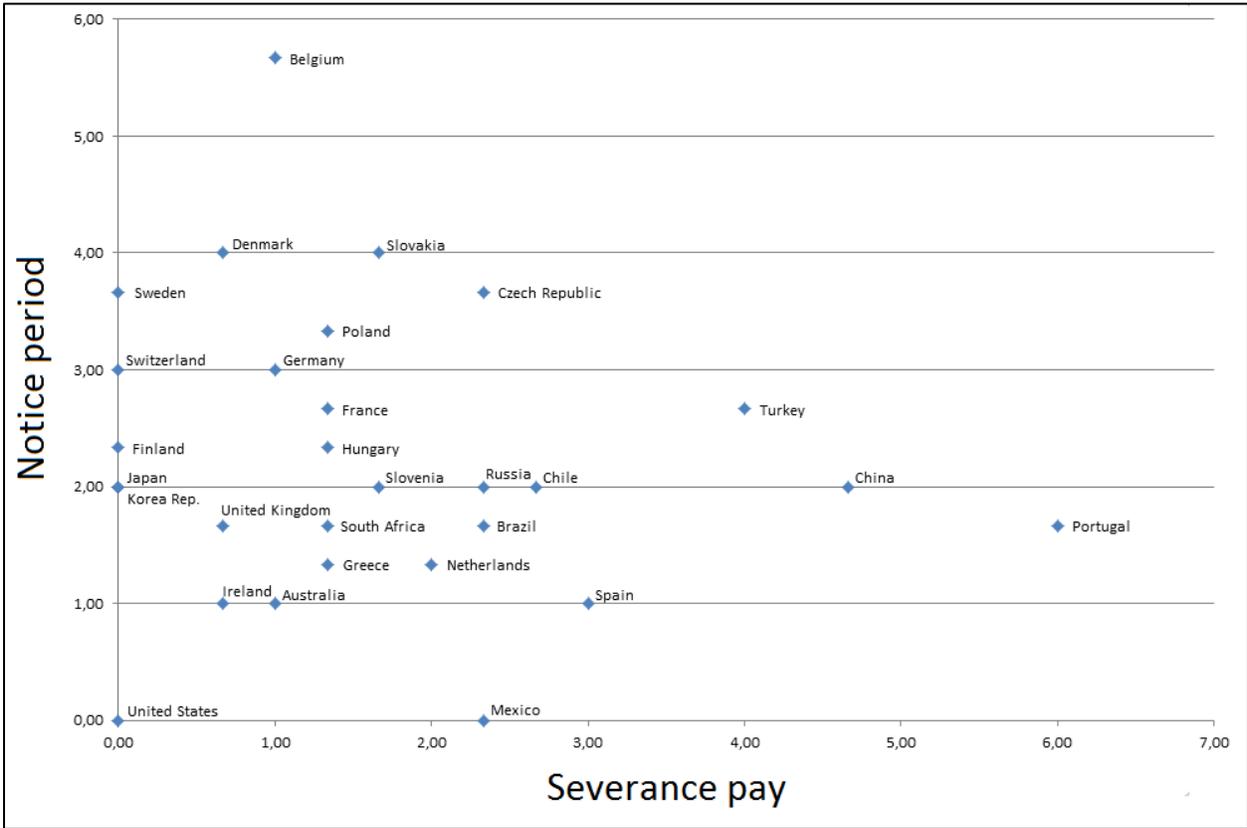
FIGURES

Figure 1 – Countries’ severance pay and notice period in weeks (World Bank; N=50)<sup>1</sup>



<sup>1</sup> Data on national-level legislation. The severance pay and 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)<sup>2</sup>



<sup>2</sup> Data on national-level legislation. The severance pay and notice period may be different in collectively and/or privately negotiated agreements.

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

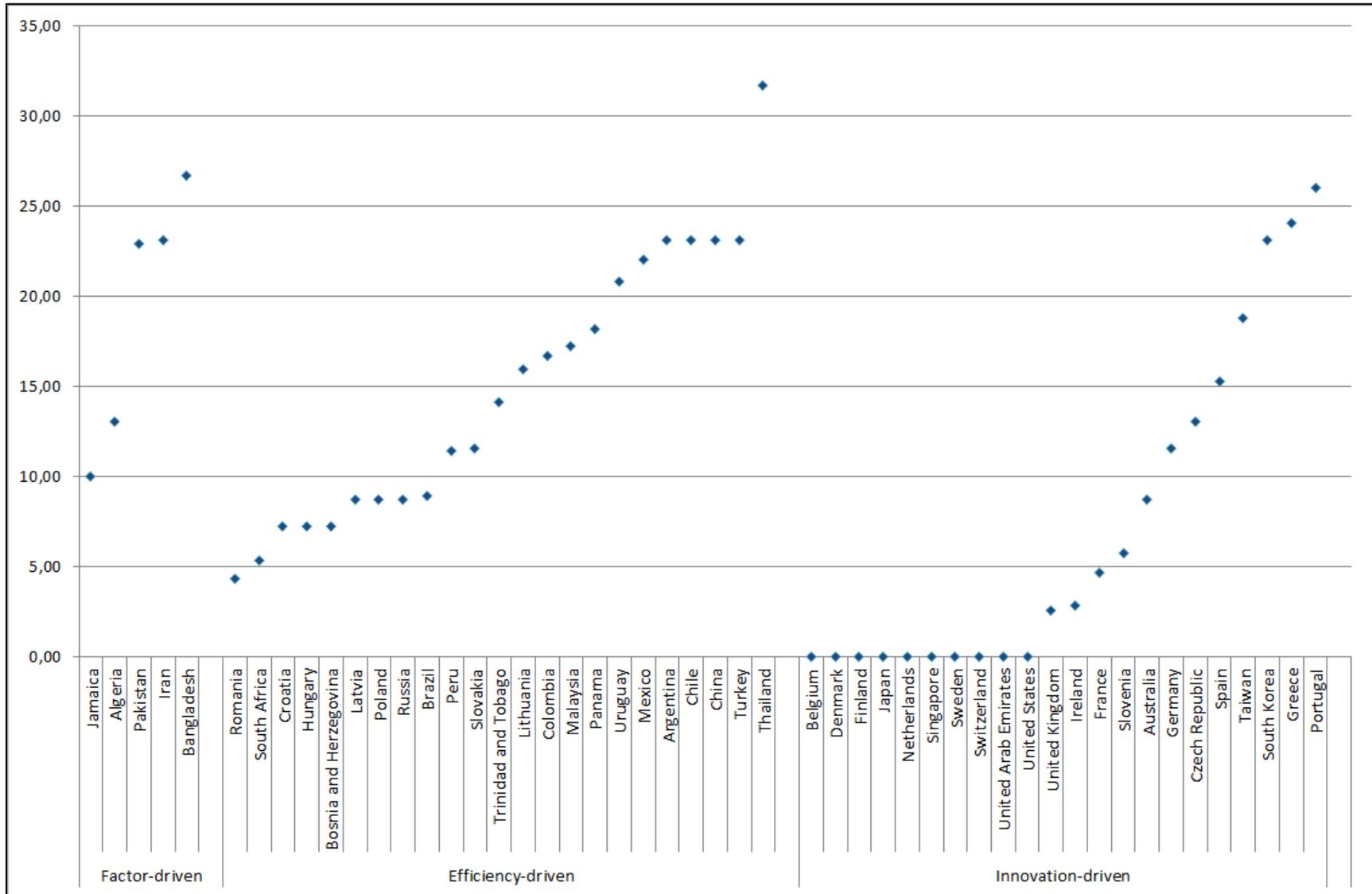


Figure 4 – Notice period in weeks (World Bank; N=50)

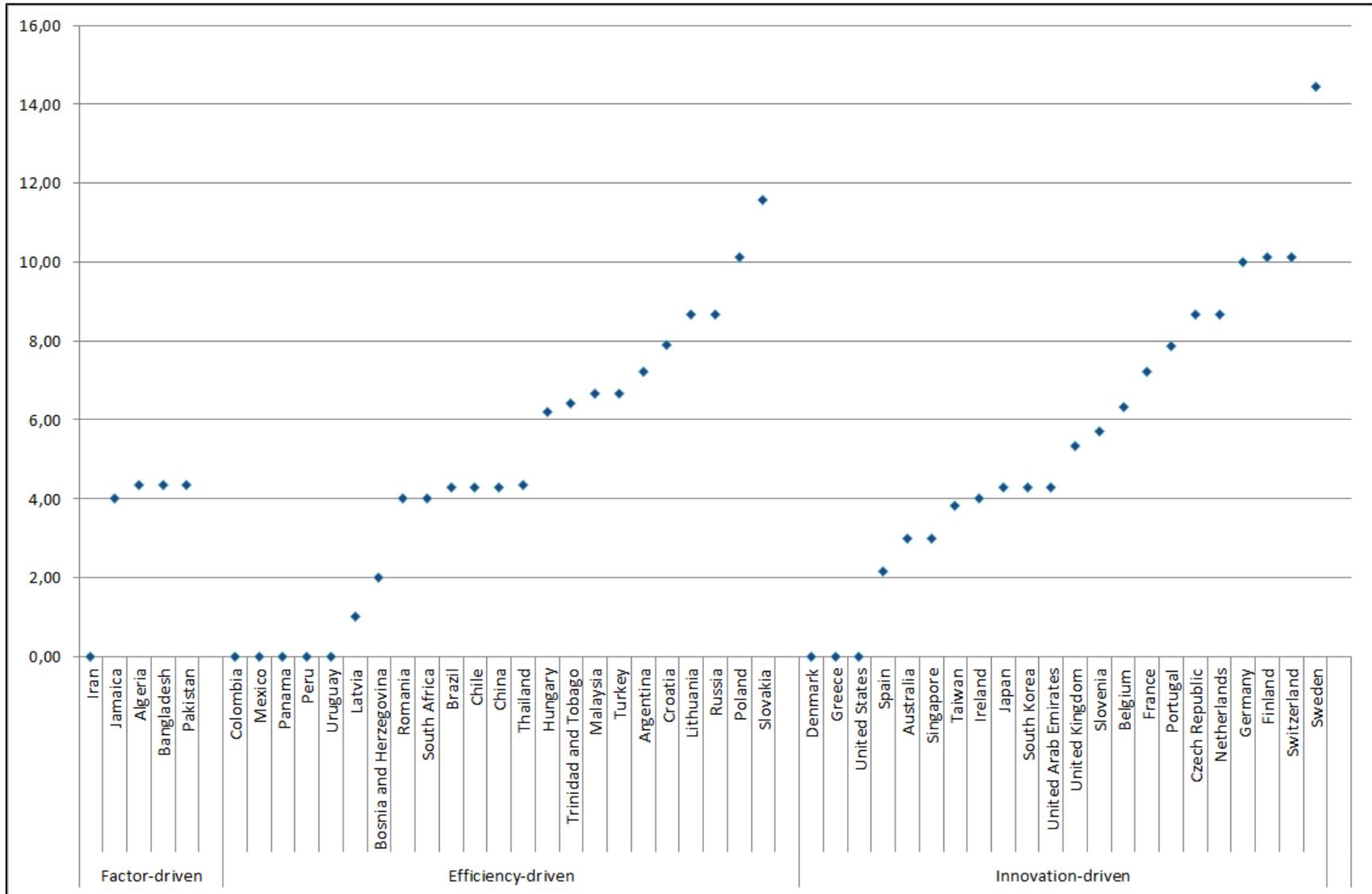


Figure 5 – Severance pay in months (OECD; N=29)

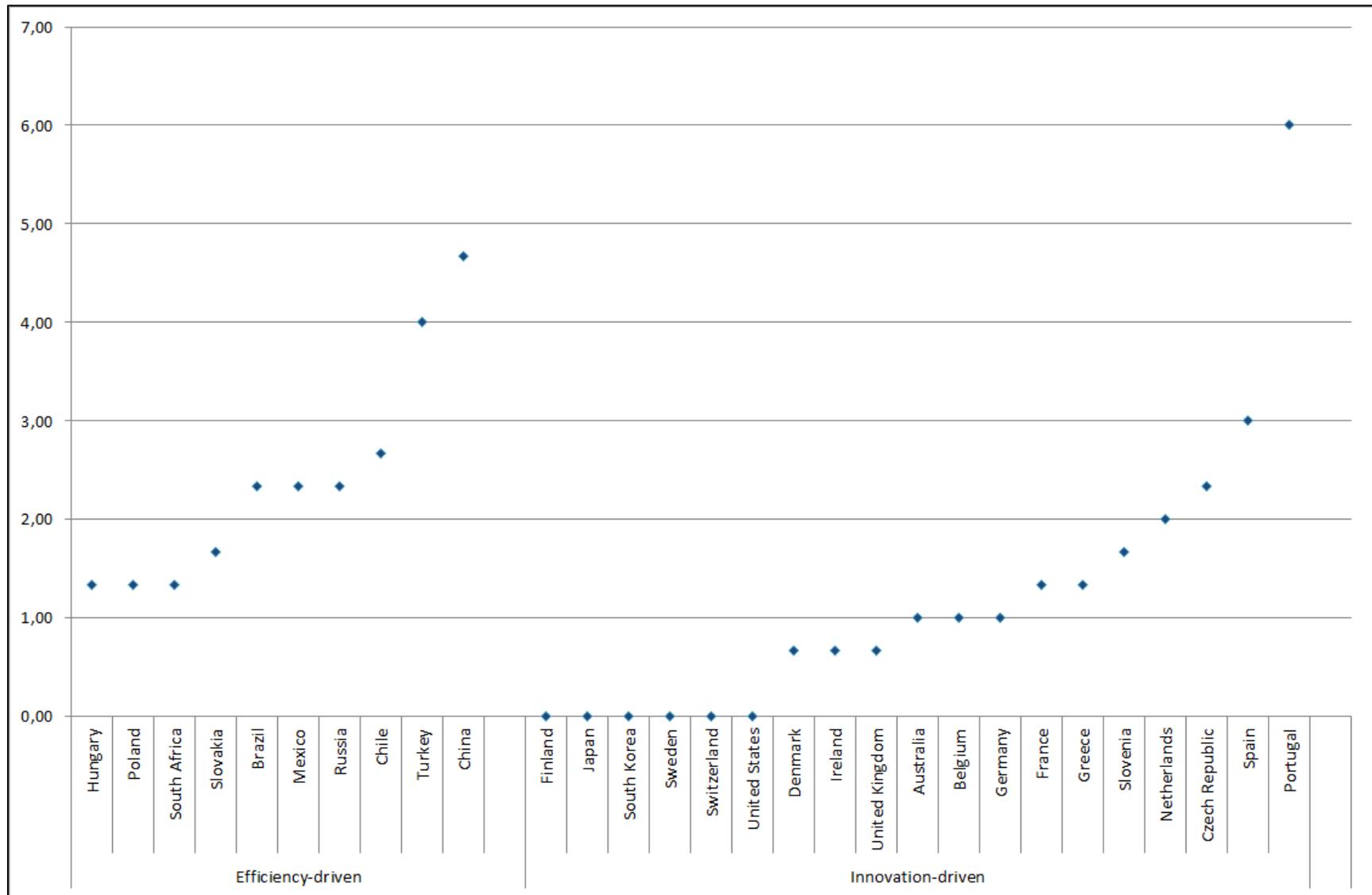


Figure 6 – Notice period in months (OECD; N=29)

