

## **Funding Innovation and the Regulatory Environment – The Role of Employment Protection Legislation**

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# **Funding Innovation and the Regulatory Environment—The Role of Employment Protection Legislation**

## **Abstract**

Access to external finance is essential for firms to engage in innovation processes and to grow. The regulatory environment plays a vital role in facilitating this access. We explore the role of employment protection legislation in the probability that firms obtain bank credit. We propose that restrictions on structuring employees' work schedules and dismissing employees reduce access to credit by increasing the credit risk incurred by lenders. Our findings are based on 21,332 observations (European Central Bank SAFE dataset and World Bank Doing Business dataset) and reveal that a higher level of employment protection legislation is negatively related to the probability of firms obtaining bank credit. These results are robust to confounding, endogeneity, and selection bias, as well as to alternative specifications.

*Keywords: Innovation Management, Access to Finance, Institutional Environment, Employment Protection Legislation, Labor Market Regulation*

# **Funding Innovation and the Regulatory Environment—The Role of Employment Protection Legislation**

## **1. Introduction**

In this paper, we explore the role of employment protection legislation in firms' access to external finance. External finance is essential for the innovation process (e.g., Brem et al. 2020; Eggers 2020; Lee et al. 2015; Nylund et al. 2018). However, firms engaging in innovation processes often find it difficult to access external finance (e.g., Eggers 2020; Freel 2007). The resulting lack of financial resources can prevent firms from bringing innovative products and services to the market, growing and creating jobs (e.g., Hughes et al. 2015; Lee et al. 2015). Thus, understanding the factors that influence firms' access to external finance is of utmost importance to fostering innovation and economic growth.

One of the factors that has been found to play a major role in firms' access to external finance is the legal environment (e.g., Demirgüç-Kunt and Maksimovic 1998; La Porta et al. 1998). The quality of the law and the opportunity to enforce legal rights influence the risks associated with providing external finance (e.g., Moro et al. 2016; Saona et al. 2020). In countries with strong shareholder rights, a high level of creditor protection, or rigorous judicial enforcement, firms find it easier to access external finance because the providers of external finance are better protected and therefore more willing to invest or lend (e.g., Bae and Goyal, 2009; Laeven and Majnoni, 2005; Qian and Strahan, 2007). Pioneering studies have recently identified employment protection legislation as an additional factor that influences firms' external finance by altering their demand for debt (Serfling, 2016; Simintzi et al. 2015; Woods et al. 2017). However, employment protection legislation might not only affect firms' demand, but also their ability to access finance (Lin et al., 2018; Qiu and Shen, 2017). This study therefore investigates the role of employment protection legislation in

firms' access to bank credit for innovation projects. Firms' access to bank credit may be reduced by employment protection legislation because such legislation increases the credit risk for banks. The basic rationale underlying this relationship is that higher levels of employment protection legislation reduce the flexibility of firms to adapt to changing business conditions by employing and reducing personnel. Reduced flexibility, thus, increases adjustment costs and makes labor costs more rigid (Serfling, 2016). Based on this rationale, we argue that in the contexts of a higher level of employment protection legislation, banks should attribute a higher credit risk to firms and should therefore be less willing to provide credit to firms.

We explore the relationship between three key dimensions of employment protection legislation and firms' access to bank credit: (1) restrictions on the flexibility of employees' work schedules, (2) notice periods (i.e., the notification lead time required for employee termination), and (3) third party notification/approval requirements for the dismissal of an employee. We formulate one hypothesis for each dimension. We empirically test these hypotheses with a set of logit regressions based on 21,332 observations collected in ten European countries in semi-annual intervals from 2009 to 2014 as part of the European Central Bank's Survey on the Access to Finance (SAFE). In this survey, firms report their access to bank loans and their use of alternative sources of finance, as well as financial and liquidity constraints. We integrate this dataset with information on employment protection legislation in these respective countries obtained from the World Bank. We find that firms' access to bank credit is hampered when employment protection legislation reduces the flexibility of firms to optimally allocate their human resources due to restrictions on the employees' work schedules, notice periods, and the involvement of third parties in the dismissal process. However, a more differentiated picture arises from our granular analysis. Notice periods are negatively related to firms' credit access only in cases of employees who

have joined the firm recently. In addition, the involvement of a third party in the dismissal process is only relevant for credit access if firms are required to get their approval rather than simply notify them about the envisaged dismissal.

To the best of our knowledge, this paper is among only a few to empirically investigate the role of employment protection legislation in determining access to external finance, a key enabler of innovation projects and subsequent job creation and growth. Our results contribute to two streams of research. First, this paper adds to the growing body of literature on the role of employment protection in firms' financial performance (Lee et al. 2013), their financing decisions (Kuzmina, 2013; Matsa, 2010; Matsa, 2018; Serfling, 2016; Simintzi et al., 2015; Woods et al., 2017) and their access to finance (Lin et al., 2018; Qiu and Shen, 2017). We add to this stream of research by investigating the relationship between firms' access to credit and specific employment protection regulations, namely restrictions on structuring employees' working hours and on the dismissal of employees. Second, this paper contributes to the literature on the determinants of access to finance (Berger and Udell, 1995; de Almeida and Eid, 2014; Demiroglu et al., 2012; Elsas, 2005; Gopalan et al., 2011; Kysucky and Norden, 2014; Liberti and Mian, 2009; Moro and Fink, 2013; Neuberger et al., 2008; Ongena and Popov, 2016; Petersen and Rajan, 1994), by expanding the literature that looks at the impact of legal regulations, in particular on credit access (Bae and Goyal, 2009; Chava et al., 2009; Cho et al., 2014; Giannetti, 2003; Laeven and Majnoni, 2005; Moro et al., 2016; Qian and Strahan, 2007; Tang et al., 2017). Building on this research, our paper provides insights into how employment protection legislation affects credit access. A contextualized understanding of firms' credit access also advances our knowledge on a key driver of innovation projects (Brem et al. 2020; Eggers 2020; Freel 2007; Lee et al. 2015; Nylund et al. 2018).

In addition, this research also contributes to practice and policy. Our findings inform policy makers about the importance of flexible employment protection regulations in promoting firm access to credit, which, in turn, facilitates innovation and growth. The policy implications of our findings are particularly important in the context of the European Union (the setting of this study), where despite the fundamental freedom of circulation of goods, there is considerable variation in capital and employer labor flexibility: firms located in countries with more flexible employment protection regulations may have a competitive advantage vis-à-vis firms located in countries with less flexible employment protection regulations, as the latter cannot be protected via trade barriers and can find it harder to access capital.

The paper is organized as follows: Section 2 presents the theoretical background. Section 3 discusses the dataset and the methodology, and describes the variables used in the analysis. Descriptive statistics are provided in section 4. In section 5, we present the econometric findings regarding the impact of employment protection regulations on obtaining credit, an additional analysis regarding the role of industry, and robustness checks. In section 6, we discuss our findings. Section 7 concludes the paper.

## **2. Theoretical background**

External finance is essential to the innovation process (Brem et al. 2020). It allows firms to develop innovative products and services, which in turn help them to create and maintain a competitive advantage, create jobs and achieve growth (Hasan and Tucci 2010). Yet firms often find it difficult to obtain the finance they need. Researchers have devoted considerable effort to investigating the factors that influence access to finance. Access to bank credit is of particular interest because it is one of the main forms of finance for firms (Cassar 2004; Heyman et al. 2007). In recent years, employment protection legislation has

been found to be one of the factors that influences access to bank credit (Lin et al. 2018; Qiu and Shen, 2017; Zhang et al. 2020). Employment protection legislation may be linked to credit access because it increases the credit risk of loans extended by banks. A higher level of employment protection makes it more difficult for firms to manage their workforce (Blanchard and Portugal, 2001), thereby increasing their adjustment costs (Nickell, 1978). This increase in adjustment costs is particularly relevant for innovative firms, because they have to be able to adjust rapidly and to access the finance needed in response to any changes in their evolution. In turn, higher adjustment costs make firms less likely to respond to the business cycle by hiring or dismissing employees (Kugler and Pica, 2008; Messina and Vallanti, 2007), which indirectly makes labor costs more rigid (Serfling, 2016). Due to these two interrelated effects, firms located in countries with higher employment protection will find it more difficult to structure their employees' working hours as needed and to lay off employees in order to compensate for lower cash flows. The inability to lay off employees when cash flow is low effectively creates a fixed drainage of cash that will be incurred by the firm irrespective of its performance. This increases the firm's risk of financial distress and the likelihood of problems in repaying its bank loans. Anticipating these effects, banks will attribute a higher default risk to firms located in countries with higher levels of employment protection. Thus, a higher level of employment protection should reduce firm access to credit due to the higher credit risk associated with increased adjustment costs and lower flexibility in reacting to economic downturns. In addition, firms with insufficient access to credit in high employment protection legislation environments are unable to substitute labor – the relatively expensive factor – for capital (Cingano et al. 2010; Calcagnini et al. 2014). Consequently, the negative effect of employment protection legislation on productivity and investment is reinforced among firms that are financially constrained.

Surprisingly few papers explore the relationship between employment protection

legislation and access to external finance. They focus predominantly on the role of employee participation as a specific element of employment protection legislation. The empirical evidence presented in these papers is mixed. While some papers show a positive relationship, suggesting that employee participation can lead to better access to debt finance and more favorable financing conditions (Lin et al. 2018; Zhang et al. 2020), others indicate a negative relationship, arguing that employee participation reduces the recovery rate of banks in case of bankruptcy of the firm (Qiu and Shen, 2017). In order to obtain a more comprehensive picture of the relationship between employment protection legislation and access to bank loans, we investigate “on-going” employment regulations related to restrictions on structuring employees’ work schedules and on employment termination as relates to dismissal procedures. We consider six specific types of restrictions, two related to on-going employment and four related to employee dismissal.

Turning to the first type, we consider two different regulations that limit a firm’s discretion to structure employees’ work schedules, namely restrictions on night work and restrictions on limiting within-week holidays. Both regulations reduce a firm’s flexibility to manage its workforce and therefore increase its adjustment costs by making labor costs more rigid. As a consequence, we expect banks to attribute a higher credit risk and to be less likely to provide credit to firms operating subject to these restrictions. This leads to the following hypotheses:

**H1a:** Restrictions on night work are negatively related to the probability that firms obtain credit.

**H1b:** Restrictions on limiting employee within-week holidays are negatively related to the probability that firms obtain credit.

Termination of employment requires that several procedural regulations, such as notice periods or the notification and/or approval of third parties, are adhered to. While these regulations do not directly entail costs for the firms, they make the termination process longer and more complex and may therefore indirectly increase a firm's adjustment costs and reduce its flexibility. The longer the notice period is, the more difficult it is for firms to adjust their workforce in response to an economic shock, organizational changes, employee performance or disciplinary issues. We therefore argue that a longer notice period increases a firm's adjustment costs and reduces its flexibility, which in turn increases its bank's risk of a loan default. As a consequence, the probability that banks provide credit to firms decreases. Accordingly, we formulate the following hypotheses:

**H2a:** The longer the statutory notice period for employees with one year of tenure, the lower the probability that firms obtain credit.

**H2b:** The longer the statutory notice period for employees with five years of tenure, the lower the probability that firms obtain credit.

We also investigate how the compulsory involvement of third parties in the termination process impacts the firm's probability of obtaining credit. Employment protection legislation may stipulate that third parties, such as government agencies or unions, have to be notified or have to approve an employee's layoff. In this case, a party outside the firm, which typically has little or no knowledge of the firm, has the right to be actively involved in one of the firm's core strategic decisions, namely its human resource management. While this provision aims to protect the employee from wrongful dismissal, it might not always allow the firm to employ the best person for the job, as it might be forced to continue an inadequate employment relationship if the third party denies approval. Even if

the involvement of a third party leads to constructive negotiations between the firm and the third party, where both the firm's and the employee's interests are taken into consideration, the time period between the firm's intention to dismiss the employee and the third party's decision to approve or disapprove the dismissal might be long and unpredictable. This scenario decreases a firm's flexibility and increases its adjustment costs. We therefore expect banks to be less likely to grant credit in an environment where third parties are required to participate in the dismissal process. On the basis of these arguments, we propose the following hypotheses:

**H3a:** When the dismissal of an employee requires the notification of a third party, the probability that firms obtain credit is lower.

**H3b:** When the dismissal of an employee requires the approval of a third party, the probability that firms obtain credit is lower.

### **3. Data and Methodology**

#### ***3.1 Data***

Our analysis relies primarily on the data obtained from the Survey on the Access to Finance of Enterprises (SAFE) conducted on behalf of the European Commission and the European Central Bank (ECB). SAFE gathers facts about firms' access to finance within the European Union. It is an on-going survey that has collected data every six months since 2009, and systematically covers thirteen euro-area countries (namely Austria, Belgium, France, Finland, Germany, Greece, the Netherlands, Ireland, Italy, Luxemburg, Malta, Portugal and Spain). We exclude Luxemburg and Malta because of the small number of observations available, and Greece because of the lack of data on employment protection legislation. Firms in the sample are randomly selected from the Dun & Bradstreet database. The sample is

stratified by firm-size class, economic activity and country. The sample size for each economic activity is chosen to guarantee satisfactory representation across the four largest industries: manufacturing, construction, trade and services. SAFE excludes firms whose activities relate to agriculture, forestry, fishing, financial intermediation and public administration as well as extra-territorial organizations and holding companies from the sample due to the specifics of these industries.

Also, the sample sizes are selected on the basis of representation at the country level. The specific individual in each firm that responds to the survey is a top-level executive, and the questionnaire is administered in the local language. Between 4,500 and 6,000 firms were interviewed in each wave. For smaller countries such as Finland and Portugal, the number of firms interviewed in each wave ranges from 100 in spring 2009 to 800 in autumn 2014. For larger countries such as France and Spain, the number of firms interviewed in each wave ranges from 1,000 in spring 2009 to 1,500 in autumn 2014. 70% of the surveyed firms were present in only one wave and less than 20% were present in two consecutive waves. In this respect, we do not have a proper panel dimension that allows us to exploit firm-level effects in our analysis. We start with a dataset that contains 87,825 observations: 66,493 firms that did not apply for a loan, and 21,332 firms that applied for a loan in the period between spring 2009 and autumn 2014.

We combine the SAFE dataset with information from the quarterly Bank Lending Survey (BLS), collected by central banks on behalf of the ECB. The BLS contains information about a bank's lending in the past three months and its propensity to lend in the next six months. It also offers detailed data on a bank's propensity to lend to large and small/medium-sized firms. We include the observations on banks' lending to firms and the bank's assessment of general economic and business risks in the previous three months in order to control for credit availability in the market. We use the Eurostat homogeneous data

on GDP growth and unemployment rates to control for macroeconomic conditions, and the Herfindahl-Hirschman Index of Bank Concentration (HHI) provided in the ECB data warehouse to control for the bank market structure. Data on employment protection legislation comes from the World Bank’s Doing Business dataset on Labor Market Regulation. The World Bank’s Doing Business dataset measures how easy or difficult it is to start up and operate a business in a specific country. It provides quantitative indicators that cover twelve areas of business regulation, including starting a business, enforcing contracts and registering property. Among the business regulations considered are also regulations on employing workers. Our analysis relies on the quantitative measures that relate to these regulations. We note, however, that the dataset does not contain information for the entirety of our sample period with respect to one of our variables—*Notice period after 1 year*. Observations for 2009 are missing for this variable. The analyses on this variable thus rely on a marginally smaller dataset.

### **3.2 Methodology**

Our analysis uses traditional logit regressions (Hosmer and Lemeshow, 2000), since the dependent variable (whether a firm obtains credit or not) is binary. As described above, the panel dataset is unmatched at the firm level, so we use pooled logit regressions. We estimate the probability of obtaining credit (given that the firm applies for a loan) using the following model

$$P(\text{credit})_{|submit} = a + \beta(L_{jt}) + \alpha(F_{kt}) + \delta(C_{jt}) + \varepsilon_1$$

where  $L_j$  represents a vector of labor market characteristics of the country  $j$  at time  $t$ ,  $F_k$  represents a vector of firm characteristics of the firm  $k$  at time  $t$ ,  $C_j$  represents a vector of characteristics of the country  $j$  at time  $t$ , and  $\varepsilon_1$  represents the residual error.

Employment protection legislation differs at the country and industry levels. This fact can generate clustering effects on the errors of the regressions. Thus, we estimate standard errors that are robust to clustering of errors by considering 40 different clusters (ten countries and four industries in each country). Since the dataset provides weights that restore the proportions of the economic weight (in terms of the number of employees) of each firm-size class, economic activity and country, we estimate our regressions by including these weights. We estimate a set of regressions, where we enter the independent variables one by one. This approach avoids multicollinearity problems linked to the fact that our independent variables are correlated with each other.

Employment regulation might be affected by the industry, as different industrial sectors might be more or less sensitive to different aspects of employment protection legislation. Restrictions on night work, for example, might be more relevant for asset-intensive industries (e.g., the automobile sector). In order to obtain a more granular picture of the role played by employment protection legislation, we re-estimate the original specification by examining the role of our variables of interest in four subsamples that include firms in the four industries we consider.

In addition, we conduct a number of robustness checks in order to address selection bias and endogeneity. First, even though our analysis of credit access considers only firms that apply for a loan, we cannot rule out the possibility that our results are affected by selection bias. Thus, we re-estimate our model implementing the Heckman (1979) selection approach. We use the dataset that contains both firms that applied and firms that did not apply for a loan, and employ the binary response model with sample selection, where the dependent variable indicates whether or not the firm applies for a loan. The full information maximum likelihood approach we follow is similar to that used by Piga and Vivarelli (2004) and Piga and Atzeni (2007) and, in the case of lending, to that used by Moro et al. (2016).

The use of this approach does not involve the calculation of the inverse Mill's ratio (IMR). Thus, the sample selection issue is not dealt with as an issue of an omitted variable. The selection equation requires at least one variable that affects the demand for a loan, but that is not relevant in the main model. We rely on (i) short-term financial needs and medium- and long-term financial needs as declared by the firm, (ii) the firm's possibility to rely on internal sources of finance, (iii) the expected economic outlook and (iv) the bank system's willingness to provide credit. These variables influence the firm's decision to apply for a loan as proven by their high correlation with the dummy variable that measures whether the firm applies for a loan. At the same time, they do not affect the bank's decision to provide credit to the firm as also suggested by statistical evidence. Thus, empirical evidence supports the exclusion condition.

Second, we cannot rule out that our regressions might suffer from endogeneity. In order to address this issue, we re-estimate our model by instrumenting our independent variables with the share of inhabitants of working age, the percentage of votes obtained by left-wing parties in the most recent elections, and the number of firms per 1,000 inhabitants. We argue that a greater share of inhabitants of working age (and thus a smaller share of young and elderly people) might lead to a higher pressure on governments to develop legislation that targets employment markets and protects employees. In addition, left-wing parties are typically more supportive of employment protection legislation than right-wing/liberal parties. A higher share of votes obtained by these parties will therefore lead to more protective employment protection regulation. In contrast, the number of firms per 1,000 inhabitants should have the opposite effect. The greater this number, the greater the pressure on the government to loosen employment protection legislation in order to support firms. All three variables have an impact on employment protection legislation, but they do not affect the final outcome (the probability to obtain credit). This is also statistically proven by the low

correlation between these three variables and the dependent variable.

Third, our analysis can suffer from simultaneity, as the probability of obtaining credit might not only depend on employment protection legislation but also on the demand for credit. In countries with a lower demand for credit, firms might find it easier to access credit. However, the demand for credit might be influenced by employment protection legislation, as in countries with better employment protection legislation the demand for credit might be lower. To address this issue, we estimate two simultaneous regressions. The first regression estimates the demand for credit in a country (as the ratio of firms that apply for credit to the overall number of firms surveyed by the ECB) as a function of employment protection legislation and a set of controls. The second regression estimates the probability of obtaining credit as a function of employment protection legislation, a set of controls and the demand for credit. The regressions are

$$DD_{jt} = \alpha_2 + \beta_2(L_{jt}) + \alpha_2(F_{kt}) + \delta_2(C_{jt}) + \varepsilon_2$$

and

$$P(\text{credit})_{\text{submit}} = \alpha_3 + \beta_3(L_{jt}) + \alpha_3(F_{kt}) + \delta_3(C_{jt}) + \gamma(DD_{jt}) + \varepsilon_3$$

where  $L_j$ ,  $F_k$  and  $C_j$  are the vectors as defined above and  $DD_{jt}$  represents the demand of credit in the country  $j$  at the time  $t$  as the ratio of firms that apply for credit to the overall number of firms surveyed by the ECB in each quarter. Since the demand for credit takes values between 0 and 1, we use Tobit regression.

Fourth, it can also be argued that the economic/financial crisis that affected some EU countries more than others might influence credit access. In order to control for this issue, we re-estimate our regressions by including a dummy variable that equals 1 in the year in which the country is considered to be a distressed country by the ECB and 0 otherwise.

### ***3.3 Dependent Variable***

To explore the relationship between employment protection legislation and credit access, we rely on one of the questions asked in the SAFE, namely whether the firms obtained the credit they applied for in the last six months. We use the answer to this question (the firm obtained the credit = 1; the firm did not obtain the credit = 0) as our dependent variable.

### ***3.4 Independent Variables***

We use six independent variables to test our hypotheses. The first variable, *Restrictions on night work*, is used to test hypothesis 1a. It is a dummy variable that equals 1 if there are restrictions on night work and 0 otherwise. The second variable, *Restrictions on limiting employees' weekly holidays*, is used to test hypothesis 1b. This variable is also a dummy that takes a value of 1 if there are restrictions on limiting employees' weekly holidays and 0 otherwise. It measures if employees are free to take weekly holidays whenever they wish, as firms do not have the right to prevent them from doing so.

To test hypothesis 2a we use the continuous variable *Notice period after one year*. The variable measures the length of the notice period for an employee with one year of tenure and is expressed in weeks of salary. Because of a lack of observations for this variable for 2009, the regressions are estimated using only 19,746 observations. To test hypothesis 2b we use *Notice period after five years*. Just like *Notice period after one year*, the variable is continuous and expresses the length of the notice period in weeks of salary.

Hypothesis 3a is tested using the variable *Third party notification for one dismissal*. The variable is a dummy that takes the value of 1 if the obligation to notify a third party for one dismissal exists and 0 otherwise. Lastly, hypothesis 3b is tested using the variable *Third party approval for one dismissal*. The variable measures if a firm that wants to dismiss a single employee has to obtain the approval of a third party. Again, it is a dummy variable that

equals 1 if the obligation exists and 0 if the obligation does not exist.

### **3.5 Controls**

We include a set of controls for firm characteristics, the economic context and the moment in time when the data was collected. In terms of firm characteristics, SAFE provides some information about the size of the firms by clustering them into four categories: micro, small, medium-sized and large firms. We use three dummy variables that identify *Micro firms* (fewer than 10 employees), *Small firms* (from 10 employees to 49 employees) and *Medium-sized firms* (from 50 employees to 249 employees). In line with earlier findings, we expect micro and small firms to be more likely to face a rejection, since they are supposedly less solid and successful.

In addition, SAFE clusters firms according to four age categories: younger than two years, between two and five years, between five and nine years, and older than nine years. We use *Firms up to 2 years old*, *Firms 2-5 years old*, and *Firms 5-9 years old* as dummy variables to identify the age group. Previous research suggests that older firms have an established reputation that banks rely on when making lending decisions (Martinelli, 1997) and that they are therefore more likely to obtain a loan (Berger and Udell, 1995; Petersen and Rajan, 1994). We control for the *Change in labor costs*. This is a categorical variable which takes a value of -1 if the firm faces a reduction in labor costs, 0 if there is no change, and +1 if there is an increase.

Regarding the financial strategy of the firms, we include dummies that identify whether the firm used any of the following sources of finance in the last period: *Trade credit*, *Leasing and factoring*, *Retained earnings* and additional *Equity*.

Since the independent variables are time-invariant at country level, we do not include any control for the country. However, we consider a set of macroeconomic variables that are country-specific and time-varying to capture the macroeconomic context in which the firms

operate. In particular, we include the *Change in GDP* and the *Unemployment rate*. Additionally, we consider the market structure of the financial industry by using the *Herfindahl-Hirschman Index (HHI) of Bank Concentration* in each country, as previous research suggests an impact of bank competition on credit access (Carbó-Valverde et al., 2009; Neuberger et al., 2008). Moreover, we account for the financial context by including the index that measures *Industry risk* as perceived by banks and the European Central Bank's *BLS index* for small and medium-sized firms. The BLS index measures if banks apply more rigid rules for the provision of credit (positive values) or more lenient ones (negative values). This variable allows us to control for the credit made available to firms by the bank system.

The dataset provides unmatched observations for twelve semesters (2009-2014). Thus, we use eleven dummies that identify the *Semester* in which the data was collected.

#### **4. Descriptive Statistics**

The dataset used contains 21,332 complete observations from ten countries for the period between the first semester of 2009 and the second semester of 2014. A summary of the descriptive statistics is reported in Table 1.

[TABLE 1]

The majority of the firms are SMEs (60%) and almost 80% are older than 9 years. In terms of financing, firms appear to use leasing and factoring as well as trade credit quite intensively, but do not seem to rely a lot on additional equity. The coefficient of the BLS index is positive (3.9), implying that, on average, the banking system is tightening credit standards and hence is reducing the provision of credit.

As far as the variables of interest are concerned, 41% of the firms face restrictions on night work. These restrictions affect firms in Spain, Italy and the Netherlands. Interestingly, restrictions on limiting within-week holidays exist only in 27% of the cases, namely for firms

in Belgium, France and Portugal. The notice period for employees with one year of tenure is 4.33 weeks on average, and ranges from a minimum of 1 week (Ireland) to a maximum of 6.5 weeks (Italy). The notice period for employees with five years of tenure increases to 6.9 weeks on average, ranging from a minimum of 2 weeks (Austria) to a maximum of 8.7 weeks (Germany). The involvement of third parties in the dismissal process presents a heterogeneous picture: while 65% of the firms have to notify a third party in case of a single dismissal, approximately 3% of the firms—i.e., only firms in the Netherlands—have to obtain the approval of a third party for the dismissal of one employee.

## **5. Results**

We first present the results for the relationship between three different dimensions of employment protection legislation and the probability of obtaining credit. Subsequently, we conduct further analyses and robustness checks and present the findings of the robustness checks in separate subsections.

### ***5.1 Employment Protection Legislation and Obtaining Credit***

The results regarding the relationship between restrictions in structuring employee work schedules and the probability that firms obtain credit are reported in Table 2A.

[TABLE 2A]

We test hypothesis 1a in model 1. This model explores the association between restrictions on night work and the probability that firms obtain a loan. Restrictions on night work have a negative and significant relationship with the probability that firms obtain a loan. Thus, firms that operate in a context which prevents them from freely employing their workforce at night are less likely to get a loan from a bank. This finding supports H1a. Regarding control variables, the size and age of the firm affects access to credit, as smaller and younger firms are less likely to obtain credit. With regard to the sources of finance used

by firms, the use of leasing and factoring as well as the use of trade credit are significant and negatively related to obtaining credit. This could be consistent with lower quality or more opaque firms relying on these more expensive sources of finance. Change in labor costs is significant and positively related to obtaining credit. Economic expansion (GDP) is positively related to obtaining credit, whereas the unemployment rate is negatively related to obtaining credit. The index that measures industry risk from the banks' point of view is not significant. As expected, the European Central Bank's BLS index is negatively associated with obtaining credit, but only at a 10% level.

In model 2, we analyze the relationship between restrictions on limiting employees' week holidays and the probability that firms obtain credit. This model tests hypothesis 1b. Our findings suggest a significant and negative relationship between restrictions on limiting employees' week holidays and the probability that firms obtain credit. This result supports H1b. Thus, if firms operate in contexts in which they do not have the right to prevent employees from taking holidays during the week, they find it more difficult to access credit. The controls do not present any major differences with respect to model 1. Only the European Central Bank's BLS index turns out to be not significant.

The results regarding the relationship between the length of the notice period and the probability that firms obtain credit are reported in Table 2B.

[TABLE 2B]

In model 3, we investigate the relationship between the notice period for employees with one year of tenure and the probability that firms obtain credit to test hypothesis 2a. The variable of interest is significant and negatively related to obtaining credit: the longer the notice period for employees with one year of tenure, the lower the probability that firms obtain credit. This finding supports H2a. Regarding the controls included in this regression, there are no major changes in significance or sign with respect to the models presented in

Table 2A.

Model 4 tests hypothesis 2b and focuses on the relationship between the notice period for employees with five years of tenure and the probability that firms obtain credit. This variable of interest is not significant—a finding that suggests that the length of the notice period for employees with five years of tenure is not related to the likelihood of getting a loan. A possible explanation could be that dismissal is less likely to be linked to the employee's suitability for the job. There are no changes in the significance and sign of the controls in this model compared to model 3. All in all, our evidence suggests that the length of the notice period is associated with access to credit but that this relationship is limited to employees with short tenure.

The results for the relationship between the involvement of third parties and the firm's probability of obtaining credit are reported in Table 2C.

[TABLE 2C]

In model 5, we test hypothesis 3a and explore whether the requirement to notify a third party if one employee is dismissed is linked to the probability that a firm obtains credit. The variable of interest is not significant. The relationship between the requirement to obtain the approval of a third party for one dismissal is investigated in model 6. This model tests hypothesis 3b. In line with our expectations, the variable of interest is significant and negative. Thus, the requirement that a third party must approve an employee's dismissal is negatively associated with the probability that a firm obtains credit, since it increases the firm's credit risk due to higher adjustment costs. There are no changes in the significance and sign of the controls in model 6 compared to model 5.

### ***5.2 Further Analysis: The Role of Industry***

Our analysis relies on the joint observations of firms that belong to different industries. However, we cannot rule out that the role of employment protection legislation

differs among industries. For instance, both the service and the trade industry might be more sensitive to seasonal flexibility than the manufacturing industry, which might in turn be more sensitive to restrictions on night work. The service and the trade industry might also be more sensitive to the length of the notice period since they typically suffer from higher fluctuation. All in all, it is therefore necessary to examine the impact that employment protection legislation can have at industry level and, at the same time, verify whether our initial results hold.

In order to explore the role of industry, we re-estimate the regressions on subsamples that include the firms belonging to four industries (manufacturing, construction, service and trade). The results are reported in Tables A.1 and A.2 in the appendix. In the interest of space, the tables only report information about the variables of interest that are significant in the analyses presented in section 5.1. The variables that are not significant in these analyses, i.e., the notice period for employees with five years of tenure and the requirement to notify a third party if one employee is dismissed, are not significant in any of the industries either. There are no major changes in the controls in the respective regressions.

Model 1 presented in Table A.1 shows the relationship between the variable *Restrictions on night work* and the probability that firms obtain credit in the four industries. This variable of interest is negative and highly significant in all industries. Thus, firms operating in contexts which impose restrictions on night work are less likely to obtain a loan regardless of the industry they are in. This finding is in line with our findings for the entire dataset presented in Table 2A. In model 2 presented in Table A.1 we present our findings for the relationship between the variable *Restrictions on limiting employees' week holidays* and the probability of obtaining credit in the four industries. This variable of interest is highly significant and positively related to obtaining credit in the construction industry subsample, but it is not significant in the other three industries. Construction firms typically have fixed

completion dates that require them to rigidly plan their workload. If construction firms are not allowed to prevent employees from taking holidays during the week due to restrictions imposed by law, they can suffer from a lack of resources needed to meet the completion date. As a consequence, they bear higher adjustment costs and are less likely to obtain credit.

Model 3 presented in Table A.2 shows the results for the relationship between the variable *Notice period after one year* and the probability that firms obtain a loan. The variable of interest is negative and significant in all industries, just as in our original findings for the entire dataset presented in Table 2B. This finding suggests that the length of the notice period is negatively associated with the probability of obtaining a loan irrespective of the industry. In model 6 presented in Table A.2 we investigate the association between the variable *Third party approval for one dismissal* and the probability of obtaining credit. Again, the variable of interest is negative and significant in all industries. This is in line with our findings for the entire dataset presented in Table 2C. Firms operating in contexts which require them to obtain the approval of a third party if one employee is dismissed are thus less likely to obtain a loan regardless of the industry.

### **5.3 Robustness Checks**

In this section we report the results of robustness checks that are conducted to rule out the possibility that our findings are affected by the financial crisis, selection bias or endogeneity issues. First, the financial crisis might impact both credit access and employment protection legislation. One might expect that countries like Italy or Spain, which were hit more strongly by the economic downturn than other EU countries, faced a greater reduction in credit access. At the same time, these countries might also have experienced reforms in employment protection legislation. We conduct additional analyses in order to explore whether this is the case. The Doing Business coefficients on employment protection legislation used are constructed on an annual basis, but do not reflect any variability during

the period considered. This suggests that the countries in the sample did not implement any major changes in their respective employment protection regulations. Moreover, our data show a very low correlation between the firms' reliance on bank credit in a particular country (proxied by the trade credit to total liabilities ratio) and the employment protection legislation variables. We can therefore rule out confounding effects linked to simultaneous changes in credit access and employment protection legislation.

Second, although our analysis of the probability of obtaining credit considers only firms that apply for a loan, we cannot completely rule out the possibility that our results are affected by selection bias. Thus, we re-estimate the regressions where the employment protection legislation variables are significant by using the Heckman sample selection model (Heckman, 1979). As discussed in the methodology section, we exploit elements that affect the firm's decision to apply for a loan (but not the probability of obtaining credit) by using the following variables: the firm's declared need of short- as well as medium- and long-term finance, the firm's possibility to rely on internal sources of finance, the expected economic outlook, and the bank system's willingness to lend. Results are reported in Table 3.

[TABLE 3]

The regressions are significant in all specifications. The independent variables have the same sign and significance level as in the original regressions. There are no major changes in the sign and the significance level of the controls. All in all, we can conclude that our original models appear not to suffer from selection bias.

Third, it could be argued that our analysis suffers from endogeneity. In order to address this issue, we re-estimate our regressions by instrumenting the variables of interest by using the share of inhabitants at working age, the percentage of votes obtained by left-wing parties in the last elections, and the number of firms per 1,000 inhabitants. Results are reported in Table 4.

[TABLE 4]

The instrumented variables are significant and have the same sign as the original variables of interest presented in Tables 2A, 2B and 2C.

An additional robustness check looks at the possibility of simultaneity in our analysis, as the probability to obtain credit might not only depend on employment protection legislation but also on the demand for credit. A lower overall demand for credit at country level (influenced by employment protection legislation, as a better protected employment market might lower the demand for credit) might make it easier for firms to obtain credit. Thus, we estimate a model with two simultaneous regressions: the first regression uses the demand for credit as dependent variable and the employment protection legislation variables as independent variables; the second regression uses the probability of obtaining credit as dependent variable and the demand for credit and the employment protection legislation variables as independent variables. The results obtained (details not reported here) are in line with the basic model, as there are no changes in the sign and significance level of the employment protection legislation variables.

We also re-estimate our models controlling for the industry. In the original models, the industry dummies have not been included, as we pursued more detailed analyses based on the industry subsamples. However, when we include the industry dummies as controls there are no changes in the significance level and sign of both controls and variables of interest.

All in all, the results of our robustness checks are consistent with the initial econometrics. Specifically, the additional analyses and robustness checks suggest that our original findings are not affected by confounding. In addition, we provide evidence that the results are robust to sample selection, endogeneity, alternative control variables and simultaneity.

## 6. Discussion

Overall, our findings suggest that restricting a firm's ability to adapt to changing business conditions by limiting its discretion to employ and terminate staff is negatively related to the probability of obtaining a loan. Our findings are hence in line with Qiu and Shen (2017), who find that the new unionization of firms increases the cost of debt, which indirectly makes access to credit more difficult. Moreover, our findings also indicate that a granular analysis is needed to better understand the relationship between employment protection legislation and credit access. Although we expected higher levels of employment protection to be associated with a lower probability of obtaining credit, we found two variables of interest not to be significant. Thus, banks are selective in which employment protection regulations they consider as a potential threat to the firm's ability to repay its loan. It is therefore important to focus on specific employment protection regulations to understand this effect.

Regulations that restrict a firm's flexibility to structure employees' work schedules negatively affect its bank's decision to lend. These regulations prevent firms from adapting to changes in demand by simply temporarily changing their employees' weekly working schedules (Corominas et al., 2004). As a consequence, firms operating in a context that imposes such regulations incur higher adjustment costs and suffer from a decrease in competitiveness. Banks seem to account for this effect by restricting firms' credit access.

Our findings regarding restrictions on employee dismissal show a similar picture. First, the length of the notice period is negatively related to the probability that firms obtain credit. Interestingly, however, we find that the ability to dismiss employees on short notice is only relevant in the case of employees with a short tenure, but not in the case of employees with a longer tenure. This finding adds an important new dimension to earlier empirical evidence on the relationship between employment protection legislation and the quality of job

matching (Marinescu, 2009). Shorter notice periods enable firms to adjust their workforce at lower cost and hence improve the sorting of employees into jobs they are best suited for. However, these benefits will be mitigated with employees' increasing tenure, since bad matches will more likely already be weeded out. In addition, the general positive relationship between the flexibility to adapt human resources to the firm's needs on short notice and access to credit might be outweighed by another effect. As employees gain skills and job-specific expertise over time (i.e., they become longer tenured), it becomes more difficult for firms to lay them off in reaction to financial distress. This would risk the loss of valuable human capital, endangering firm competitiveness and future performance. As a result, the length of the notice period plays a more pronounced role at the beginning of employment relationships, while the conflicting effects balance each other out in the case of longer-tenured employees.

Second, our findings indicate that banks' lending decisions are negatively related to the requirement to involve a third party in the dismissal process. This is, however, only the case if firms have to obtain a third party's approval in order to terminate an employment, but not if firms only have to notify a third party before the dismissal of an employee. While banks regard the obligation to notify a third party as merely an administrative hurdle, they see the obligation to obtain a third party's approval as interference in the firms' human resource management. This interference might prevent the dismissal of unsuitable employees and therefore affect the firms' flexibility and increase the bank's risk.

## **7. Conclusion**

This research examines the role of the regulatory environment in accessing external finance for innovation by exploring the relationship between employment protection legislation and a firm's ability to access credit. Specifically, we investigate how employment

protection legislation affects firm access to credit by looking at credit in ten European countries. The results suggest that employment protection legislation plays an important role in facilitating credit access: regulations that allow for greater flexibility in structuring employee work schedules or dismissing employees tend to increase the probability of obtaining credit. For innovating firms, flexibility is especially important in order to be able to adapt to change (Altuzarra and Serrano 2010; Zhou et al. 2011). Our results show that banks consider this aspect in their risk assessment of loan applications. Overall, based on a coherent theoretical basis, our results hence clearly highlight the importance of flexible employment protection regulations to foster access to credit—a relationship that might not be obvious at first.

These implications are of great relevance for policy makers as they highlight the risk of market distortions if countries have different levels of employment protection legislation. Firms located in countries with more flexible employment protection legislation may have a competitive advantage vis-à-vis firms located in countries with more rigid employment protection legislation, as the latter can find it more difficult to obtain credit. Particularly in our setting of the study, the European Union, countries cannot reduce this competitive advantage via trade barriers due to the fundamental freedoms of the European Single Market—the free movement of goods, capital, services, and labor. To avoid market distortions, policy makers should thus promote a harmonized European employment protection legislation that creates equal opportunities for firms located in the European Union, irrespective of the country they are located in. Harmonized European employment protection legislation becomes even more important in light of the COVID-19 pandemic. To prevent significant job losses, many member states of the European Union have introduced policy measures to preserve employment, such as short-time work schemes (Belghitar et al. 2021; Goniewicz et al. 2020; Sabat et al. 2020). Due to the diversity of these policy measures

within the European Union, market distortions that lead to differences in the firms' ability to obtain credit could further increase. At the same time, banks might be more reluctant to provide loans because they fear an increase in nonperforming loans (Goodell, 2020). This reluctance depends on the policy measures European Union member states take to mitigate the economic consequences of the COVID-19 pandemic, including financial support, loosening of capital requirements or adjustments to insolvency rules (Dursun-de Neef and Schandlbauer, 2021). Taken together, additional market distortions might result from diverse policy measures aimed at preventing unemployment and mitigating the economic consequences within the European Union. These policy measures could lead to differences in the firms' ability to access credit. Hence, harmonized policy measures for the pandemic are needed to create equal opportunities for firms located in the European Union.

We note that our dataset has limitations. Specifically, the SAFE dataset does not contain detailed firm-level financial information (e.g., turnover, assets, liabilities or costs). The available financial information is mostly in the form of categorical variables which, for example, only indicate whether a respective financial ratio remained stable, increased or decreased. This limits the possibility of including comprehensive firm-level financial controls in the analyses. As financial ratios such as leverage ratio or profitability can affect the probability of obtaining a loan, future research that is based on primary data should control for them. In addition, the SAFE dataset includes only a limited number of observations from young firms, limiting the possibility of running additional analyses on the role of employment protection legislation in credit access of young firms.

These limitations of our work open avenues for future research. First, future research could focus in more detail on the relationship between employment protection legislation, firms' financial performance and credit access. Since the present research includes ten European Union countries, it could be interesting to expand the research to both other

developed (i.e., United States, Canada, Australia) and developing countries. Moreover, differences with regard to specific employment protection regulations at the industry level could be an interesting area of research in order to investigate if particular industries are put at a disadvantage in accessing credit. Second, future research could also explore if differences in firm age influence the relationship between employment protection legislation and credit access. This could help countries foster start-up activities by designing employment protection rules that are positively associated with access to finance.

Notwithstanding these limitations, our study clearly indicates that employment protection legislation is related to the supply of credit to firms.

## References

- Altuzarra, A., Serrano, F., 2010. Firms' Innovation Activity and Numerical Flexibility. *Industrial and Labor Relations Review* 63, 327–339.
- Bae, K.H., Goyal, V.K., 2009. Creditor Rights, Enforcement, and Bank Loans. *Journal of Finance* 64, 823–860.
- Belghitar, Y., Moro, A., & Radić, N., 2021. When the rainy day is the worst hurricane ever: the effects of governmental policies on SMEs during COVID-19. *Small Business Economics*. <https://doi.org/10.1007/s11187-021-00510-8>
- Berger, A.N., Udell, G.F., 1995. Relationship Lending and the Lines of Credit in Small Firm Finance. *Journal of Business* 68, 351–381.
- Blanchard, O., Portugal, P., 2001. What Hides Behind an Unemployment Rate: Comparing Portuguese and U.S. Labor Markets. *American Economic Review* 91, 187–207.
- Brem, A., Nylund, P., Viardot, E., 2020. The Impact of the 2008 Financial Crisis on Innovation – A Dominant Design Perspective. *Journal of Business Research* 110, 360–369.
- Calcagnini, G., Ferrando, A., Giombini, G., 2014. Does Employment Protection Legislation Affect Firm Investment? The European Case. *Economic Modelling* 36, 658–665.
- Carbó-Valverde, S., Rodríguez-Fernández, F., Udell, G.F., 2009. Bank Market Power and SME Financing Constraints. *Review of Finance* 13, 309–340.
- Cassar, G., 2004. The Financing of Business Start-ups. *Journal of Business Venturing* 19, 261–283.
- Chava, S., Livdan, D., Purnanandam, A., 2009. Do Shareholder Rights Affect the Cost of Bank Loans? *Review of Financial Studies* 22, 2973–3004.
- Cho, S.S., El Ghouli, S., Guedhami, O., Suh, J., 2014. Creditor Rights and Capital Structure:

- Evidence from International Data. *Journal of Corporate Finance* 25, 40–60.
- Cingano, F., Leonardi, M., Messina, J., Pica, G., 2010. The Effect of Employment Protection Legislation and Financial Market Imperfections on Investment: Evidence from a Firm-Level Panel of EU countries. *Economic Policy* 25, 117–163.
- Corominas, A., Lusa, A., Pastor, R., 2004. Characteristics and Classification of the Annualised Working Hours Planning Problems. *International Journal of Services Technology and Management* 5, 435–477.
- De Almeida, J.R., Eid, E., 2014. Access to Finance, Working Capital Management and Company Value: Evidences from Brazilian Companies Listed on BM&FBOVESPA. *Journal of Business Research* 67, 924–934.
- Demirgüç-Kunt, A., Maksimovic, V., 1998. Law, Finance, and Firm Growth. *Journal of Finance* 53, 2107–2137.
- Demiroglu, C., James, C., Kizilasan, A., 2012. Bank Lending Standards and Access to Lines of Credit. *Journal of Money, Credit and Banking* 44, 1063–1089.
- Dursun-de Neef, H.Ö., Schandlbauer, A., 2021. Covid-19 and lending responses of European banks. *Journal of Banking and Finance* 133. DOI: 10.1016/j.bankfin.2021.106236.
- Eggers, F., 2020. Masters of disasters? Challenges and Opportunities for SMEs in Times of Crisis. *Journal of Business Research* 116, 199–208.
- Elsas, R., 2005. Empirical Determinants of Relationship Lending. *Journal of Financial Intermediation* 14, 32–57.
- Freel, M.S., 2007. Are Small Innovators Credit Rationed? *Small Business Economics* 28, 23–35.
- Giannetti, M., 2003. Do Better Institutions Mitigate Agency Problems? Evidence from Corporate Finance Choices. *Journal of Financial and Quantitative Analysis* 38, 185–213.
- Goniewicz, K., Khorram-Manesh, A., Hertelendy, A.J., Goniewicz, M., Naylor, K., Burkle,

- F.M.Jr., 2020. Current responses and management decisions of the European Union to the Covid-19 outbreak: A review. *Sustainability*. DOI: 10.3390/su12093838
- Goodell, J.W., 2020. Covid-19 and finance: Agendas for future research. *Finance Research Letters* 35, DOI: 10.1016/j.frl.2020.101512.
- Gopalan, R., Udell, G.F., Yerramilli, V., 2011. Why Do Firms Form New Banking Relationships? *Journal of Financial and Quantitative Analysis* 46, 1335–1365.
- Hasan, I., Tucci, C.L., 2010. The Innovation-Economic Growth Nexus: Global Evidence. *Research Policy* 39, 1264–1276.
- Heckman, J.J., 1979. Selection Bias as a Specification Error. *Econometrica* 47, 153–161.
- Heyman, D., Deloof, M., Ooghe, H., 2007. The Financial Structure of Private Held Belgian Firms. *Small Business Economics* 30, 301–313.
- Hughes, M., Eggers, F., Kraus, S., Hughes, P., 2015. The Relevance of Slack Resource Availability and Networking Effectiveness for Entrepreneurial Orientation. *International Journal of Entrepreneurship and Small Business* 26, 116–138.
- Kugler, A., Pica, G., 2008. Effects from Employment Protection on Workers and Job Flows: Evidence from the 1990 Italian Reform. *Labour Economics* 15, 78–95.
- Kuzmina, O., 2013. Operating Flexibility and Capital Structure: Evidence from a Natural Experiment, Working Paper.
- Kysucky, V., Norden, L., 2014. The Benefits of Relationship Lending in a Cross-Country Context: A Meta-Analysis. *Management Science* 62, 90–110. [https://doi.org/DOI: 10.1287/mnsc.2014.2088](https://doi.org/DOI:10.1287/mnsc.2014.2088)
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W. 1998. Law and Finance. *Journal of Political Economy* 106, 1113–1155.
- Laeven, L., Majnoni, G., 2005. Does Judicial Efficiency Lower the Cost of Credit? *Journal of Banking and Finance* 29, 1791–1812.

- Lee, P.K.C., Lau, A.K.W., Cheng, T.C.E., 2013. Employee Rights Protection and Financial Performance. *Journal of Business Research* 66, 1861–1869.
- Lee, N., Sameen, H., Cowling, M., 2015. Access to Finance for Innovative SMEs Since the Financial Crisis. *Research Policy* 44, 370–380.
- Liberti, J.M., Mian, A.R., 2009. Estimating the Effect of Hierarchies on Information Use. *Review of Financial Studies* 22, 4057–4090.
- Lin, C., Schmid, T., Xuan, Y., 2018. Employee Representation and Financial Leverage. *Journal of Financial Economics* 127, 303–324.  
[https://doi.org/https://doi.org/10.1016/j.jfineco.2017.12.003](https://doi.org/10.1016/j.jfineco.2017.12.003)
- Marinescu, I., 2009. Job Security Legislation and Job Duration: Evidence from the United Kingdom. *Journal of Labor Economics* 27, 465–486.
- Martinelli, C., 1997. Small Firms, Borrowing Constraints, and Reputation. *Journal of Economic Behavior and Organization* 33, 91–105.
- Matsa, D.A., 2010. Capital Structure as a Strategic Variable: Evidence from Collective Bargaining. *Journal of Finance* 65, 1197–1232.
- Matsa, D.A., 2018. Capital Structure and a Firm’s Workforce. *Annual Review of Financial Economics* 10, 387–412.
- Messina, J., Vallanti, G., 2007. Job Flow Dynamics and Firing Restrictions: Evidence from Europe. *Economic Journal* 117, F279-F301.
- Moro, A., Fink, M., 2013. Loan Manager Trust and Credit Access for SMEs. *Journal of Banking and Finance* 37, 927–936.
- Moro, A., Maresch, D., Ferrando, A., 2016. Creditor Protection, Judicial Enforcement and Credit Access. *European Journal of Finance* 24, 250–281.
- Neuberger, D., Pederagnana, M., R athke-D oppner, S., 2008. Concentration of Banking Relationships in Switzerland: The Result of Firm Structure or Banking Market

- Structure? *Journal of Financial Services Research* 33, 101–126.
- Nickell, S.J., 1978. Fixed Costs, Employment and Labour Demand over the Cycle. *Economica* 45, 329–345.
- Nylund, P.A., Arimany-Serrat, N., Ferras-Hernandez, X., Viardot, E., Boateng, H., Brem, A., 2018. Internal and External Financing of Innovation. *European Journal of Innovation Management* 23, 200–213.
- Ongena, S., Popov, A., 2016. Gender Bias and Credit Access. *Journal of Money, Credit and Banking* 48, 1691–1724.
- Petersen, M.A., Rajan, R.G., 1994. The Benefits of Lending Relationships: Evidence from Small Business Data. *Journal of Finance* 49, 3–37.
- Piga, C.A., Atzeni, G., 2007. R&D Investment, Credit Rationing and Sample Selection. *Bulletin of Economic Research* 59, 149–178.
- Piga, C.A., Vivarelli, M., 2004. Internal and External R&D: A Sample Selection Approach. *Oxford Bulletin of Economics and Statistics* 66, 457–482.
- Qian, J., Strahan, P.E., 2007. How Laws and Institutions Shape Financial Contracts: The Case of Bank Loans. *Journal of Finance* 62, 2803–2834.
- Qiu, Y., Shen, T., 2017. Organized Labor and Loan Pricing: A Regression Discontinuity Design Analysis. *Journal of Corporate Finance* 43, 407–428.
- Sabat, I., Neuman-Böhme, S., Varghese, N.E., Barros, P.P., Brouwer, W., van Exel, J., Schreyögg, J., Stargardt, T., 2020. United but divided: Policy responses and people's perceptions in the EU during the Covid-19 outbreak. *Health Policy* 124(9), 909–918.
- Saona, P., Vallelado, E., San Martín, P., 2020. Debt, or Not Debt, that is the Question: A Shakespearean Question to a Corporate Decision. *Journal of Business Research* 115, 378–392.
- Serfling, M., 2016. Firing Costs and Capital Structure Decisions. *Journal of Finance* 71,

2239–2286.

Simintzi, E., Vig, V., Volpin, P., 2015. Labor Protection and Leverage. *Review of Financial Studies* 28, 561–591.

Tang, Y., Deng, C., Moro, A., 2017. Firm-Bank Trusting Relationship and Discouraged Borrowers. *Review of Managerial Science* 11, 519–541. <https://doi.org/10.1007/s11846-016-0194-z>

Woods, K., Tan, K.J.K., Faff, R., 2017. Labor Unions and Corporate Financial Leverage: The Bargaining Device Versus Crowding-out Hypotheses. *Journal of Financial Intermediation* 37, 28–44. <https://doi.org/http://dx.doi.org/10.1016/j.jfi.2017.05.005>

Zhang, Y., Li, G., Lian, Y., 2020. Labor Unions and Loan Contracts. *European Journal of Finance* 26, 461–479.

Zhou, H., Dekker, R., Kleinknecht, A., 2011. Flexible Labor and Innovation Performance: Evidence From Longitudinal Firm-Level Data. *Industrial and Corporate Change* 20, 941–968.

**Table 1: Descriptive statistics – Firms Applying for Credit**

Variable	Obs	Mean	Std. Dev.	Min	Max
Credit Obtained	21332	0.6880	0.4633	0	1
Micro firms	21332	0.2165	0.4119	0	1
Small firms	21332	0.2035	0.4026	0	1
Medium-sized firms	21332	0.1819	0.3858	0	1
Large firms	21332	0.3981	0.4895	0	1
Firms up to 2 years old	21332	0.0148	0.1208	0	1
Firms 2-5 years old	21332	0.0473	0.2124	0	1
Firms 5-9 years old	21332	0.1054	0.3071	0	1
Firms older than 9 years	21332	0.7997	0.4002	0	1
Equity	21052	0.0818	0.2740	0	1
Retained profits	21091	0.3729	0.4836	0	1
Trade credit	21162	0.3767	0.4846	0	1
Leasing and factoring	21260	0.5039	0.5000	0	1
Change in labour costs	21332	0.4853	0.6537	-1	1
Change in GDP	21332	0.4031	1.9751	-7.49	7.13
Unemployment rate	21332	10.9031	6.0830	4.33	26.2
Herfindahl-Hirschman Index of Bank Concentration	21332	0.0582	0.0476	0.02	0.37
Industry risk (Bank perception)	21332	0.1075	0.1904	-0.375	1
BLS index	21332	0.0386	0.1680	-0.375	1
Restrictions on night work	21332	0.4114	0.4921	0	1
Restrictions on limiting employees' week holidays	21332	0.2663	0.4421	0	1
Notice period after 1 year	19746	4.3273	1.3939	1	6.5
Notice period after 5 years	21332	6.9163	2.3900	2	8.7
Third party notification for one dismissal	21332	0.6509	0.4767	0	1
Third party approval for one dismissal	21332	0.0340	0.1811	0	1

*Notes:* This table presents weighted summary statistics for the variables used in the empirical analysis for the subsample of firms that applied for a bank loan. The weights restore the proportions of the economic weight (in terms of number of employees) of each size class, economic activity and country and are applied to the variables derived from the survey.

**Table 2A: Restrictions on Structuring Employees' Working Hours**

VARIABLES	Model 1	Model 2
Micro firms	-0.720*** (0.125)	-0.761*** (0.128)
Small firms	-0.414*** (0.114)	-0.423*** (0.120)
Medium-sized firms	-0.139 (0.108)	-0.134 (0.109)
Firms up to 2 years old	-0.527** (0.207)	-0.515** (0.202)
Firms 2-5 years old	-0.503*** (0.111)	-0.502*** (0.110)
Firms 5-9 years old	-0.264*** (0.102)	-0.277*** (0.0986)
Equity	-0.153* (0.0824)	-0.127 (0.0832)
Retained profits	0.0386 (0.0646)	0.0571 (0.0652)
Trade credit	-0.199** (0.0792)	-0.255*** (0.0775)
Leasing and factoring	-0.231*** (0.0363)	-0.195*** (0.0335)
Change in labour costs	0.214*** (0.0373)	0.212*** (0.0386)
Change in GDP	0.0991*** (0.0252)	0.165*** (0.0353)
Unemployment rate	-0.0181** (0.00848)	-0.0372*** (0.00891)
Herfindahl-Hirschman Index of Bank Concentration	-2.468** (0.988)	-2.644* (1.549)
Waves	Included	
Industry risk (Bank perception)	-0.200 (0.00243)	-0.294 (0.00304)
BLS index	-0.304* (0.00171)	-0.366 (0.00227)
<b>Restrictions on night work</b>	<b>-0.604***</b> <b>(0.0911)</b>	
<b>Restrictions on limiting employees' week holidays</b>		<b>-0.218**</b> <b>(0.0997)</b>
Constant	2.158*** (0.192)	2.290*** (0.236)
Observations	20,748	20,748
chi <sup>2</sup>	9143	6184
p	0.0000	0.0000
Pseudo R <sup>2</sup>	0.0808	0.0748
N_clust	40	40

*Notes:*

Dependent variable: whether the bank provided the loan.

Independent variables: restrictions on night work and restrictions on limiting employees' week holidays.

Controls: firm characteristics (dummy variables for Micro firms, Small firms and Medium-sized firms); age of the firm (dummy variables for Firms up to 2 years old, Firms 2-5 years old, Firms 5-9 years old); firm's sources of finance (dummy variables for Retained earnings, Trade credit, Leasing and factoring, and Equity); firm performance (categorical variable for Change in labour costs); macroeconomic controls (Change in GDP, Unemployment rate, Herfindahl-Hirschman Index of Bank Concentration, Industry risk perceived by banks, and BLS index).

All regressions use sampling weights that adjust the sample to be representative of the population. Robust standard errors appear in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 2B: Restrictions on Employees' Dismissal – Notice Period**

VARIABLES	Model 3	Model 4
Micro firms	-0.751*** (0.132)	-0.762*** (0.125)
Small firms	-0.422*** (0.118)	-0.424*** (0.117)
Medium-sized firms	-0.139 (0.109)	-0.135 (0.108)
Firms up to 2 years old	-0.531** (0.252)	-0.501** (0.203)
Firms 2-5 years old	-0.428*** (0.123)	-0.497*** (0.110)
Firms 5-9 years old	-0.240** (0.107)	-0.274*** (0.0972)
Equity	-0.123 (0.0838)	-0.127 (0.0839)
Retained profits	0.0154 (0.0711)	0.0443 (0.0671)
Trade credit	-0.237*** (0.0774)	-0.266*** (0.0756)
Leasing and factoring	-0.222*** (0.0361)	-0.197*** (0.0330)
Change in labour costs	0.217*** (0.0411)	0.220*** (0.0389)
Change in GDP	0.0982*** (0.0265)	0.179*** (0.0393)
Unemployment rate	-0.0600*** (0.00977)	-0.0262** (0.0107)
Herfindahl-Hirschman Index of Bank Concentration	-3.049* (1.562)	-2.590* (1.534)
Waves	Included	
Industry risk (Bank perception)	0.350 (0.00300)	-0.0981 (0.00325)
BLS index	-0.769*** (0.00218)	-0.501** (0.00232)
<b>Notice period after 1 year</b>	<b>-0.143***</b> <b>(0.0397)</b>	
<b>Notice period after 5 years</b>		<b>0.0365</b> <b>(0.0252)</b>
Constant	2.771*** (0.303)	1.968*** (0.277)
Observations	19,199	20,748
chi <sup>2</sup>	2347	4008
p	0.0000	0.0000
Pseudo R <sup>2</sup>	0.0767	0.0741
N_clust	40	40

*Notes:*

Dependent variable: whether the bank provided the loan.

Independent variables: length of notice period after one year of tenure, length of notice period after five years of tenure.

Controls: firm characteristics (dummy variables for Micro firms, Small firms and Medium-sized firms); age of the firm (dummy variables for Firms up to 2 years old, Firms 2-5 years old, Firms 5-9 years old); firm's sources of finance (dummy variables for Retained earnings, Trade credit, Leasing and factoring, and Equity); firm performance (categorical variable for Change in labour costs); macroeconomic controls (Change in GDP, Unemployment rate, Herfindahl-Hirschman Index of Bank Concentration, Industry risk perceived by banks, and BLS index).

All regressions use sampling weights that adjust the sample to be representative of the population. Robust standard errors appear in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 2C: Restrictions on Employees' Dismissal – Third Party Involvement**

VARIABLES	Model 5	Model 6
Micro firms	-0.769*** (0.125)	-0.776*** (0.126)
Small firms	-0.427*** (0.117)	-0.436*** (0.117)
Medium-sized firms	-0.136 (0.108)	-0.142 (0.109)
Firms up to 2 years old	-0.499** (0.204)	-0.501** (0.208)
Firms 2-5 years old	-0.493*** (0.110)	-0.498*** (0.112)
Firms 5-9 years old	-0.273*** (0.0964)	-0.264*** (0.0953)
Equity	-0.123 (0.0828)	-0.150* (0.0825)
Retained profits	0.0387 (0.0630)	0.0407 (0.0674)
Trade credit	-0.276*** (0.0737)	-0.255*** (0.0756)
Leasing and factoring	-0.192*** (0.0313)	-0.208*** (0.0341)
Change in labour costs	0.220*** (0.0393)	0.210*** (0.0384)
Change in GDP	0.177*** (0.0400)	0.161*** (0.0379)
Unemployment rate	-0.0373*** (0.00927)	-0.0487*** (0.00822)
Herfindahl-Hirschman Index of Bank Concentration	-2.399 (1.526)	1.115 (0.849)
Waves		Included
Industry risk (Bank perception)	-0.0642 (0.00301)	-0.530* (0.00291)
BLS index	-0.565** (0.00222)	-0.278 (0.00212)
<b>Third party notification for one dismissal</b>	<b>-0.0181 (0.0979)</b>	
<b>Third party approval for one dismissal</b>		<b>-1.388*** (0.148)</b>
Constant	2.333*** (0.222)	2.367*** (0.222)
Observations	20,748	20,748
chi <sup>2</sup>	5349	5955
p	0.0000	0.0000
Pseudo R <sup>2</sup>	0.0737	0.0802
N_clust	40	40

*Notes:*

Dependent variable: whether the bank provided the loan.

Independent variables: requirement to notify a third party before a single dismissal and requirement to obtain third party approval for a dismissal.

Controls: firm characteristics (dummy variables for Micro firms, Small firms and Medium-sized firms); age of the firm (dummy variables for Firms up to 2 years old, Firms 2-5 years old, Firms 5-9 years old); firm's sources of finance (dummy variables for Retained earnings, Trade credit, Leasing and Factoring, and Equity); firm performance (categorical variable for Change in labour costs); macroeconomic controls (Change in GDP, Unemployment rate, Herfindahl-Hirschman Index of Bank Concentration, Industry risk perceived by banks, and BLS index).

All regressions use sampling weights that adjust the sample to be representative of the population. Robust standard errors appear in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 3: Heckman Selection**

VARIABLES	Model 1	Model 2	Model 3	Model 6	
Independent variables and controls as in Tables 2A, 2B and 2C		<i>Included</i>			
<b>Restrictions on night work</b>	<b>-0.331***</b> <b>(0.0509)</b>				
<b>Restrictions on limiting employees' week holiday</b>		<b>-0.117*</b> <b>(0.0618)</b>			
<b>Notice period after 1 year</b>			<b>-0.0770***</b> <b>(0.0217)</b>		
<b>Third party approval for one dismissal</b>				<b>-0.779***</b> <b>(0.0833)</b>	
Constant	1.106*** (0.160)	0.955*** (0.149)	0.999*** (0.170)	1.249*** (0.198)	1.051*** (0.163)
<b>Selection Process</b>					
Short-term financial needs	0.0997*** (0.0219)	0.0982*** (0.0218)	0.0996*** (0.0219)	0.121*** (0.0219)	0.0988*** (0.0218)
Medium- and long-term financial needs	0.631*** (0.0354)	0.632*** (0.0350)	0.631*** (0.0354)	0.625*** (0.0362)	0.632*** (0.0352)
Availability of internal funds	0.240*** (0.0483)	0.241*** (0.0483)	0.241*** (0.0483)	0.196*** (0.0541)	0.241*** (0.0481)
Expected economic outlook	0.0359** (0.0165)	0.0348** (0.0165)	0.0360** (0.0165)	0.0434*** (0.0163)	0.0360** (0.0166)
Bank system's willingness to lend	-0.0493* (0.0264)	-0.0474* (0.0258)	-0.0490* (0.0263)	-0.0250 (0.0256)	-0.0471* (0.0261)
Constant	-0.480*** (0.0323)	-0.480*** (0.0324)	-0.480*** (0.0323)	-0.500*** (0.0305)	-0.480*** (0.0324)
Observations	46,523	46,523	46,523	45,427	46,523
chi2	1965	1437	1859	2054	1674
p	0	0	0	0	0
N_clust	40	40	40	40	40

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Notes:*

Dependent variable: whether the bank provided the loan.

Independent variables: Restrictions on night work, Restrictions on limiting employees' week holidays, Notice period after 1 year, Third party approval for one dismissal.

Selection process: Short-term financial needs, Medium- and long-term financial needs, Availability of internal sources of finance, Expected economic outlook, Bank system's willingness to lend.

Controls (not reported in the table): industry (dummy variable for Construction, Manufacturing, Services); firm characteristics (dummy variable for Micro firms, Small firms and Medium-sized firms); age of the firm (dummy variable for Firms up to 2 years old, Firms 2-5 years old, Firms 5-9 years old); firm performance (categorical variable for Change in labour costs); firm sources of finance (dummy variable for Retained earnings, Trade credit, Leasing and Factoring, and Equity); macroeconomic controls (Change in GDP, Unemployment rate, Herfindahl-Hirschman Index of Bank Concentration, Industry risk perceived by banks, and BLS index).

All regressions use sampling weights that adjust the sample to be representative of the population. Robust standard errors appear in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 4: Instrumented regression**

VARIABLES	Model 1	Model 2	Model 3	Model 6
Independent variables and controls as in Tables 2A, 2B and 2C		<i>Included</i>		
<b>Restrictions on night work (IV)</b>	<b>-0.398</b> <b>(0.285)</b>			
<b>Restrictions on limiting employees' week holidays (IV)</b>		<b>-0.181</b> <b>(0.166)</b>		
<b>Third party approval for one dismissal (IV)</b>			<b>1.135</b> <b>(1.454)</b>	
<b>Notice period after 1 year (IV)</b>				<b>-0.0853</b> <b>(0.0702)</b>
Constant	1.242*** (0.117)	1.271*** (0.159)	1.276*** (0.145)	1.165*** (0.398)
Observations	20,748	20,748	20,748	19,199
chi <sup>2</sup>	6092	5401	3014	2889
p	0.0000	0.0000	0.0000	0.0000
N_clust	40	40	40	40

*Notes:*

Dependent variable: whether the bank provided the loan.

Instrumented variables: Restrictions on night work, Restrictions on limiting employees' week holidays, Third party approval for one dismissal, Notice period after 1 year.

Instruments: Percentage of working population, Number of firms per 1,000 citizens, Percentage of votes obtained by left parties in the last election.

Controls (not reported in the table): industry (dummy variable for Construction, Manufacturing, Services); firm characteristics (dummy variable for Micro firms, Small firms and Medium-sized firms); age of the firm (dummy variable for Firms up to 2 years old, Firms 2-5 years old, Firms 5-9 years old); firm performance (categorical variable for Change in labour costs); firm sources of finance (dummy variable for Retained earnings, Trade credit, Leasing and Factoring, and Equity); macroeconomic controls (Change in GDP, Unemployment rate, Herfindahl-Hirschman Index of Bank Concentration, Industry risk perceived by banks, and BLS index).

All regressions use sampling weights that adjust the sample to be representative of the population.

Robust standard errors appear in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Appendix: Table A.1 - Restrictions on Structuring Employees' Working Hours – Industry Subsamples**

VARIABLES	Model 1 Manufacturing	Model 1 Construction	Model 1 Trade	Model 1 Service	Model 2 Manufacturing	Model 2 Construction	Model 2 Trade	Model 2 Service
Independent variables and controls as in Tables 2A, 2B and 2C	included				included			
<b>Restrictions on night work</b>	<b>-0.554***</b> <b>(0.155)</b>	<b>-0.987***</b> <b>(0.183)</b>	<b>-0.627***</b> <b>(0.156)</b>	<b>-0.627***</b> <b>(0.156)</b>				
<b>Restrictions on limiting employees' week holiday</b>					<b>-0.0552</b> <b>(0.149)</b>	<b>-0.807***</b> <b>(0.201)</b>	<b>-0.197</b> <b>(0.165)</b>	<b>-0.213</b> <b>(0.151)</b>
Constant	2.534*** (0.233)	1.533*** (0.506)	2.577*** (0.221)	2.577*** (0.221)	2.674*** (0.370)	1.545*** (0.385)	2.693*** (0.318)	1.919*** (0.289)
Observations	6,706	2,211	4,967	4,967	6,706	2,211	4,967	6,864
P	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
r2_p	0.0982	0.128	0.107	0.107	0.0926	0.124	0.100	0.0595
N_clust	10	10	10	10	10	10	10	10

*Notes:*

Dependent variable: whether the bank provided the credit.

Independent variables: Restrictions on night work, Restrictions on limiting employees' week holiday.

Control variables (not reported in the table): firm characteristics (dummy variable for Micro firms, Small firms and Medium-sized firms); age of the firm (dummy variable for Firms up to 2 years old, Firms 2-5 years old, Firms 5-9 years old); firm performance (categorical variable for change in labour costs); firm sources of finance (dummy variable for Retained earnings, Trade credit, Leasing and Equity); macroeconomic controls (Change in GDP, Unemployment rate, Herfindahl-Hirschman Index of Bank Concentration, Industry risk perceived by banks, and BLS index).

All regressions use sampling weights that adjust the sample to be representative of the population. Robust standard errors appear in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Appendix: Table A.2 - Restrictions on Employees' Dismissal – Industry Subsamples

VARIABLES	Model 3 Manufacturing	Model 3 Construction	Model 3 Trade	Model 3 Service	Model 6 Manufacturing	Model 6 Construction	Model 6 Trade	Model 6 Service
Independent variables and controls as in Tables 2A, 2B and 2C	included				included			
<b>Notice period after 1 year</b>	<b>-0.133**</b> <b>(0.0663)</b>	<b>-0.137*</b> <b>(0.0830)</b>	<b>-0.181***</b> <b>(0.0670)</b>	<b>-0.130***</b> <b>(0.0494)</b>				
<b>Third party approval for one dismissal</b>					<b>-1.417***</b> <b>(0.121)</b>	<b>-1.923***</b> <b>(0.418)</b>	<b>-1.491***</b> <b>(0.177)</b>	<b>-1.307***</b> <b>(0.231)</b>
Constant	2.810*** (0.611)	2.033*** (0.768)	3.645*** (0.474)	2.534*** (0.313)	2.753*** (0.331)	1.757*** (0.526)	2.778*** (0.274)	1.969*** (0.243)
Observations	6,274	2,014	4,634	6,277	6,706	2,211	4,967	6,864
P	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
r <sup>2</sup> <sub>p</sub>	0.0946	0.120	0.109	0.0588	0.0977	0.121	0.108	0.0641
N <sub>clust</sub>	10	10	10	10	10	10	10	10

*Notes:*

Dependent variable: whether the bank provided the credit.

Independent variables: length of notice period after one of tenure, length of notice period after five years of tenure, third party approval for one dismissal.

Control variables (not reported in the table): firm characteristics (dummy variable for Micro firms, Small firms and Medium-sized firms); age of the firm (dummy variable for Firms up to 2 years old, Firms 2-5 years old, Firms 5-9 years old); firm performance (categorical variable for Change in labour costs); firm sources of finance (dummy variable for Retained earnings, Trade credit, Leasing and Factoring, and Equity); macroeconomic controls (Change in GDP, Unemployment rate, Herfindahl-Hirschman Index of Bank Concentration, Industry risk perceived by banks, and BLS index).

All regressions use sampling weights that adjust the sample to be representative of the population. Robust standard errors appear in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1