LISBON
SCHOOL OF
ECONOMICS &
MANAGEMENT
UNIVERSIDADE DE LISBOA

MASTER IN
FINANCE

MASTER'S FINAL WORK
DISSERTATION

MINIMUM CAPITAL REQUIREMENT POLICY AND ENTREPRENEURIAL ACTIVITY

MARIA ZUBATKINA

OCTOBER 2016

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SUPERVISION:

PROFESSORA DOUTORA ANA ISABEL ORTEGA VENÂNCIO

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Abstract

This study analyzes the impact of the minimum capital requirement policy on entrepreneurial activity. More precisely, it investigates how a reduction of the minimum capital requirement affects firms' creation and their initial capital structure. Our data comes from a Portuguese database – Simplified Corporate Information (SCIE), *Sistema de Contas Integradas das Empresas*. We apply the difference-in-difference approach using a treated group with *Sociedades por Quotas* and control group of *Sociedades Anonimas*.

We find that reducing the minimum capital required to start a business leads to an increase in firm's entry and job creation by about 15%. The reform mainly stimulates formation of very small firms with one and two employees. Also, the amounts of initial capital and first year debt and equity of start-ups decrease with the reform. However, the initial capital structure of new firms does not change. There is no statistically significant impact of the reform on the new firms' debt-to-equity ratio.

Keywords: Minimum Capital Requirement, Start-ups, Capital Structure, Firm Entry

Resumo

O presente estudo analisa o impacto da política de requisitos mínimos de capital na atividade empreendedora. Mais precisamente, investiga como uma redução dos requisitos mínimos de capital afeta a criação das empresas e a sua estrutura de capital inicial. Para a elaboração desta dissertação, utilizamos um conjunto de dados provenientes da base de dados portuguesa – SCIE, *Sistema de Contas Integradas das Empresas*. De forma a identificar o impacto da reforma, aplicamos o método de diferenças em diferenças usando um grupo tratado com *Sociedades por Quotas* e um grupo de controlo com *Sociedades Anónimas*.

As nossas principais conclusões são que a redução dos requisitos mínimos de capital para iniciar uma start-up leva a um aumento na entrada das empresas e emprego em cerca de 15%. A reforma estimula principalmente a formação de empresas muito pequenas com um e dois funcionários. Adicionalmente, o valor do capital inicial, dívida e capital próprio para o primeiro ano de funcionamento das empresas diminui com a reforma. Contudo, a estrutura de capital inicial das novas empresas não é afetada. Não há impacto estatisticamente significativo da reforma no rácio da dívida/capital próprio das novas empresas.

Palavras-chave: Capital Social Inicial, Start-ups, Estrutura Financeira, Capital Próprio, Capital Alheio, Entrada de Novas Empresas

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1. Introduction

In recent years governments around the world have focused on encouraging entrepreneurship as a way to promote job creation, innovation and economic growth (Blanchflower, 2000; Audretsch and Thurik, 2001; Carree and Thurik, 2003; Kreft and Sobel, 2005; Djankov, McLiesh and Ramahlo, 2006). The main policy implemented has been optimizing procedures and reducing time and costs to set up a business (World Bank, 2016).

Another popular measure has been lowering or eliminating the minimum capital requirement (World Bank 2014, 2016). Such a policy creates a more attractive environment for firms' entry (Van Stel *et al.*, 2007; Becht *et al.*, 2008). For example, eliminating the minimum capital requirement and lowering incorporation costs favored the increase of foreign limited companies in the UK (Becht *et al.*, 2008).[1] According to the same authors, this policy was among the driven factors in corporate mobility especially among firms originating from high minimum capital requirements countries.

Previous literature suggests that lack of capital is a major constraint to entrepreneurial activity (Evans and Jovanovic, 1989; Holtz-Eakin *et al.*,1994; Blanchflower and Oswald, 1998; Fairlie and Krashinsky, 2006). Failure to find the necessary funds prevents individuals from entering into entrepreneurship (Holtz-Eakin *et al.*,1994, Blanchflower and Oswald, 1998, Armour, 2006). For example, Evans and Jovanovic (1989) find that individuals with greater assets are more likely to start a business than those with scanty financial resources. Receiving an inheritance is also associated with higher probability of entering into entrepreneurship (Holtz-Eakin *et al.*,1994). Thus the

[1] It is important to note that after 2000 the European Court of Justice permitted to freely choose firm's location within the European Union

liquidity constraints theory suggests that the minimum capital requirement policy is a binding limitation to start a business. Imposing a fixed amount of assets in the beginning of the life of start-up reduces firm entry (Van Stel, Storey and Thurik, 2007).

Also, previous studies suggest that the mandatory initial capital fails to fulfill its main function: protect creditors and consumers interests (Djankov *et al*., 2002; Armour, 2006; Djankov, 2009). The fixed amount of minimum capital does not serve as collateral to creditors as it is not related to potential risks of a particular firm activity (Armour, 2006; Djankov, 2009). Others argue that entry barriers promote corruption and informal economy rather than bringing benefits for the consumers (Djankov *et al*., 2002).

In 2011, Portugal reduced the initial capital requirement for new firms from 100 euro to 1 euro per quota and diminished the total amount of capital from 5,000 euro to any value (Law N^{o} 33/2011). This new regulation applies to private limited liability companies. The goal of this policy was to promote entrepreneurial initiative and stimulate innovation and business development.

In this study we evaluate the effects of this policy by providing new insights on existing country-specific literature devoted to firm entry costs. Our research questions are: What is the impact of this policy on firm entry? Does it affect firms' initial capital structure?

To answer these questions, we use the Simplified Corporate Information database (SCIE), *Sistema de Contas Intergradas das Empresas*. This database has comprehensive information on the number of new private firms established between 2004 and 2014. For each firm we collect detailed information on their initial capital structure and firm

characteristics (size, industry, legal form and year of entry). The time range allows us to cover the periods before and after policy change.

We find that cutting minimum capital requirement promotes entrepreneurship in a way that it increases firms' entry. The reform increases the number of new firms as well as jobs created by almost 15%. It favors mostly very small firms with one or two employees. In terms of new firms' initial capital structure, the reform does not affect the debt-to-equity ratio of the analyzed start-ups. But post-reform firms are characterized by lower initial capital amount as well as lower equity and debt amounts registered in the entry year compared to the firms created in the absence of the reform.

This study contributes to the understanding of the effects of minimum capital policy on entrepreneurial activity and new firms' capital structure. Better understanding of the efficacy of this kind of policy can help policy makers to define appropriate measures towards promotion of entrepreneurship.

Our study is organized as follows. Section 2 reviews the literature and section 3 presents the hypotheses. Then, in section 4 we describe the policy. Section 5 presents the data. In section 6 the empirical methodology and results are reported. Finally, section 7 concludes.

2. Literature Review

2.1 Entry regulation

The entry regulation includes the time, costs, procedures and minimum capital required to register a business (World Bank , 2016). The rationale for entry regulation is established by the public interest theory. According to this theory, the stringent entry rules are needed to correct market failures and to assure higher quality of products and other socially relevant outcomes (Djankov *et al.*, 2002). Nevertheless, Djankov *et al.* (2002) do not find support for this theory. In fact, they do not find positive correlation between the entry regulatory framework and product quality, health or environment. In contrast, the public choice theory argues that entry regulation serves in favor of insiders' interests (De Soto, 1989; Stigler, 1971). More severe regulatory tools are linked to higher corruption and bureaucracy (Djankov et al., 2002). Moreover, large entry costs compel firms to operate within informal sector, thereby enable unofficial economy (Djankov et al., 2002). Other beneficiaries of stringent entry regulation are industry incumbent firms (Stigler, 1971). Entry barriers allow the incumbent firms to gain competitive advantage position and thus benefit from increase in profits and in market power (Djankov, 2009).

In the last years, several studies have empirically analyzed the scope of entry regulatory framework and business start-up activity. High number of procedures and time required to set up a company is associated with lower entry rates (Fonseca *et al.*, 2001). Burdensome entry barriers result in a reduction of entry and growth even in industries with naturally high entry rates (Klapper et al., 2006). High level of regulation deters entrepreneurship by preventing individuals from starting a business (Ardagna and Lusardi, 2010). In particular, burdensome entry regulation negatively affects

opportunity entrepreneurship (Levie and Autio, 2011). On contrast, better business regulation is associated with higher level of firms' creation (Divanbeigi and Romalbo, 2015).

Other studies evaluate the effects of entry deregulation reforms (Monteiro and Assuncao, 2006; Mullainathan and Schnabl, 2010; Bruhn, 2011; Yakovlev and Zhuravskaya, 2013; Branstetter *et al.*, 2014). Recent examples of such reforms include the creation of rapid business opening system in Mexico (Bruhn, 2011) and the opening of one-stop shop in Portugal (Branstetter *et al.*, 2014). In both cases the authors show that such entry process simplifications promoted firm and job creation.

2.2 Minimum capital policy

Besides time, costs and number of procedures, other reforms involve changing the minimum capital required to start a new firm (World Bank, 2014). A recent empirical study of the UK suggests that eliminating the minimum capital serves as a driving factor for firms' incorporations (Becht *et al.*, 2008). In recent years, the UK experienced a business registration inflow, particularly from the countries with higher minimum capital requirements (Becht *et al.*, 2008). Following this, several countries have applied the same policy (Bratton et al, 2008; Eckardt, 2012; Ringe, 2013). For instance, since 2008 German start-ups can be established through a new legal form (Unternehmergesellschaft) with 1 euro of capital. This measure decreased the number of German companies incorporated outside Germany, particularly in the UK (Eckardt and Kerber, 2013). Also Hungary and Poland significantly lowered their minimum capital requirements (Hornuf, 2012; Braun *et al.*, 2011) and France reduced minimum capital requirement to 1 euro (Ringe, 2013). All these reforms resulted in an increase of start-ups in all four countries (Hornuf, 2012, Braun et al., 2011). Another example is Saudi

Arabia which before 2007 had one of the highest minimum capital requirements in the world, 125 000 dollars (Belayachi and Haidar, 2008). Its elimination led to an increase in business registration by 81% (Nehau, 2013). Thus, empirical evidence suggests that reducing minimum capital requirement increases firm formation.

Table 1 provides a summary of the empirical evidence on entry reforms.

3. Theory and Hypothesis.

Minimum capital requirement implies that the founder has to make a deposit in bank or allocate a fixed amount of assets to the new firm (World Bank, 2014). The capital required to set up a firm depends on the legal structure of the start-up (Schoen, 2004; Eidenmueller et al., 2006) and it represents the price of entry to limited liability (Armour, 2006; Eidenmueller et al., 2006; Machado, 2009).

Several reasons have been appointed to require a minimum capital. By investing the initial capital, shareholders obtain the ownership rights to claim firm's returns and creditors obtain collaterals for their claims (Armour, 1999). Also, the minimum capital requirement protects creditors in case of bankruptcy (Djankov, 2009; World Bank, 2014) and it creates a buffer in case of future losses and thus, to a certain extent, safeguards against insolvency (Eidenmueller et al., 2006).

Moreover, it prevents individuals from hazardous activities (Pentz et al., 2006). The capital invested implies a commitment from the shareholders and thus prevents them from pursuing bad projects (Engert, 2006). Mandatory initial capital prevents unpromising business ventures at the expenses of the creditors (Eidenmueller et al., 2006). It excludes formation of undercapitalized companies and externalization of risks (Ewang, 2007; Machado, 2009). Minimum capital requirement also aims to protect consumers and to screen undesired firms (Djankov, 2009; World Bank, 2014). It sorts out individuals who engage in entrepreneurship only to get away from unemployment (Hornuf, 2012).

Previous literature suggests that minimum capital requirement creates a barrier for starting a business (Enriques and Gelter, 2006; Armour, 2006; Ewang, 2007; Payne, 2008; Djankov, 2009; Machado 2009; Petroseviciene, 2010).

The minimum capital requirement is one of the costs that entrepreneurs incur when registering a business (Djankov et al. 2002; Bratton et al, 2008). It is regarded as indirect cost imposed to potential entrepreneurs (Braun et al., 2011).

The minimum capital requirement increases the costs of financial constraints (Becht et al., 2008). According to liquidity constraints theory, new firm creation depends on the assets the individuals have at their disposal (Evans and Jovanovic, 1989; Holtz-Eakin *et al.*, 1994; Blanchflower and Oswald, 1998; Armour, 2006; Fairlie and Krashinsky, 2006). Wealthier individuals are more likely to bear risks and thus to enter into entrepreneurship (Evans and Jovanovic, 1989). The choice towards entrepreneurship is facilitated by exogenous increases in personal assets, like receiving inheritance (Blanchflower and Oswald, 1990; Holtz-Eakin *et al.*, 1994). But not enough money to meet minimum capital requirement prevents individuals to become entrepreneurs, especially risk-averse individuals (Armour, 2006). In order to meet the initial capital stock, shareholders take personal loans (Machado, 2009). Thereby, lowering the minimum capital requirement reduces the costs to start a new business, consequently we expect an increase of firm entry. In contrast, high levels of minimum capital are linked to lower rate of self-employment (Armour and Cumming, 2005) and decreases firm entry (Dreher and Gassebner, 2013). Thus, reducing minimum capital requirement will lead to higher entry rates (Van Stel *et al.*, 2007).

Thus, we expect:

Hypothesis 1: The minimum capital requirement reform increases firms' entry.

According to the signal theory, the amount invested signals the shareholders' intentions to start a business as well as their confidence on the venture quality (Pentz et al., 2006; Machado, 2009). It gives a sign to creditors about firm's trustworthiness (Engert, 2006, Enriques and Gelter, 2006) and it shows to the creditors that certain assets are available for their claims (Ewang, 2007). Thus, it makes easier to raise external funds and it helps to obtain financing from creditors who consider the amount of paid in capital before making the lending decision (Ewang, 2007). As such, the mandatory capital reduces information asymmetry between shareholders and debt holders (Armour, 1999), facilitates borrowing (Ewang, 2007) and provides financing for company's operation (Pentz et al., 2006).

Nevertheless, previous literature suggests that minimum capital requirement does not necessarily meet the financial needs of the company (Schoen, 2004; Pentz et al., 2006). The amount fixed by law does not take into account the industry or firm activity (Djankov, 2009; World Bank 2014). For some types of firms there is no need for a large amount of initial capital. For example, intellectual services firms do not need a large amount of capital to start their operations (Machado, 2009). As it disregards business characteristics, the minimum capital requirement does not safeguard from all the risks associated with firms' activity (Macey and Enriques, 2001; Schoen, 2004; Armour, 2006). Thus, it does not reflect entirely the creditworthiness of the company (Engert, 2006). After the initial phase, the entry capital can be used to purchase assets which value can decrease over time (Macey and Enriques, 2001). Thereby, it does not provide creditors with the real information about assets value and firm's solvency (Macey and Enriques, 2001; Schoen, 2004; Ewang, 2007). Minimum capital requirement is not an

important variable considered by creditors in lending decisions (Armour, 1999; Ewang, 2007). Creditors judge the firm's ability to repay the debt based on its net worth, cash flows and risk profile rather than on its ability to meet minimum capital requirement (Armour, 1999; Ewang, 2007; Djankov, 2009). To safeguard their interests creditors use other measures, namely, establish a high interest rate, ask for collateral from shareholders, or ask to comply with certain financial ratios (Macey and Enriques, 2001; Schoen 2004). Banks do not consider as a loan's collateral the amount of minimum capital contributions, but instead demand the assets purchased by the loan as collateral (Eidenmueller et al. 2006). Similarly, contractual provisions can be applied by the trade creditors and debt holders (Macey and Enriques, 2001). Moreover, the debt repayment depends on the firm's cash flows and not on the initial capital of the start-up (Dorsey, 2013). In summary, minimum capital requirement lacks a positive effect in terms of access to credit (Dorsey, 2013).

According with the signal theory, the invested amount signals the quality of a firm and the ability of shareholders to bear the risks when benefiting from limited liability (Ewang, 2007). Eliminating the minimum capital requirement leads founders to invest more than the minimum threshold defined by the law. For example, in France one year after the reform which reduced the minimum capital requirement from 7 500 euro to 1 euro, the average initial capital voluntary invested in newly created firms was 2 000 euro. Also, the percentage of companies with 1 euro of share capital was 7,63% of the total number of firms (Greffe de Paris, 2004). Although, the majority of entrepreneurs set up a share capital lower than the amount previously prescribed by law, this amount was higher than the mandatory 1 euro.

Regarding firm's capital structure, the minimum capital requirement reform does not affect the choice between debt and equity financing (Hazak, 2009). Therefore, we expect:

Hypothesis 2: The minimum capital reform does not affect the initial capital structure of the start-ups.

4. Policy

Portugal implemented the minimum capital requirement reform in 2011 (Law N^{o} 33/2011) as a part of the business registration simplification process launched in 2005. The reform started by reducing the time and costs of starting a business and by establishing one-stop shop in several counties. This broad set of measures was thereafter extended to eliminating the minimum capital requirement. The summary of the law is provided in Table 2.

This policy aims to promote entrepreneurial activity by reducing the entry costs and administrative burden for new business. As noted before, the minimum capital requirement does not constitute a true guarantee for the creditors; a great number of start-ups does not need initial capital to operate; the minimum capital requirement creates a barrier to entry, especially for young entrepreneurs without personal financial resources. According to the World Bank (2012), this reform is seen as a positive measure and is considered a good practice to facilitate business start-ups.

Before the reform, the minimum capital required to set-up a private limited liability company in Portugal was 5 000 euro with the minimum amount of 100 euro per quota[2]. With the reform the minimum amount per quota reduced to 1 euro[3] and the total capital can be defined freely. Therefore, sole proprietors can start a business with just 1 euro. Two founders can establish a private limited liability company with 2 euros. Additionally, founders can defer its payment till the end of the first financial year and can withdraw it from the bank account after the company's legal registration.

[2] Articles 201, 219 of Commercial Companies' Code (Código das Sociedades Comerciais), DL n.º 343/98, de 06 de Novembro

[3] The law of 7th of March 2011 Decreto-Lei nº 33/2011

The firms eligible for this reform are sole owner private limited liability companies (*Sociedades Unipessoas por Quotas*) and private limited liability companies (*Sociedades por Quotas*) with two or more individuals. All the other types of single person companies such as individual establishments of limited liability (*Estabelecimento Individual de Responsabilidade Limitada*) and sole proprietors with unlimited liability (*Empresário em Nome Individual*) are not covered by this law. Also, public limited companies (*Sociedade Anônima*), general partnerships (*Sociedade em Nome Coletivo*), limited partnerships (*Sociedade em Comandita*) or cooperative enterprises (*Cooperativa*) are also not eligible.

Firms that require a special authorization or that are under special laws are not eligible. For example, financial institutions have to comply with special regulation which requires them to have a minimum capital.[4] Travel agencies, passenger transport companies, taxi services, private security companies are among the business activities that need license for their operation. Table 3 presents the list of activities that are not eligible to the reform and require minimum capital.

[4] see Portaria 335/2013 of 15th of November which modifies Portaria 95/94 of 9th of February

5. Data and Descriptive Statistics

Our data comes from Simplified Corporate Information database (SCIE), *Sistema de Contas Integradas das Empresas*. This data unites the Simplified Business Information (IES) data, Statistics Portugal, *Instituto Nacional de Estatísticas*(INE), data and the Ministry of Finance information on private companies and self-employed individuals. It provides annual information on the main characteristics of the enterprises in Portugal. It is based on the accounting data, economic and financial indicators and ratios. It allows tracing the progress of the business economic activity on the firm's level over the years. The data is available from 2004 to 2014.

We restrict our analysis to the period between 2004 and 2014. We start by selecting all new firms established in each year and collect data on the main industry (CAE rev 3), region (NUTS 2), legal form, size (number of employees), entry year, exit year, sales, initial capital, equity and debt. We drop the year 2011 as we do not have information on the month that the firms were created. Besides that, we exclude firms established in non eligible industries. Furthermore, we eliminate firms which initial capital is below the minimum thresholds defined by the law. As there is no full set of information available for sole proprietors, we do not include this kind of firms into the dataset. Also we eliminate firms with the legal form *Sociedade em Nome Colectivo* as its observations are limited to 20 new firms. Thus, we analyze firms with legal form *Sociedade por Quotas* which is our treated group (firms affected by the reform) and firms with legal form *Sociedade Anónima* as a counterfactual.

The main characteristics of these two types of firms are given in the Table 4. In terms of number of founders, *Sociedade por Quotas* can be formed by at least two individuals (or 1 if it is *Unipessoal)* while *Sociedades Anónimas* should have minimum five

shareholders. The initial minimum capital required by law for *Sociedade Anónima* equals 50 000 euro[5] and this amount remained unchanged for the period covered in our analysis. As we previously mentioned, the reform changed the initial minimum capital of *Sociedade por Quotas* from 5 000 to 1 euro. Both types of firms are limited liability.

Our sample consists of the 231 016 new firms created in the period of ten years which is divided to pre-reform period from 2004 to 2010 and post-reform period from 2012 to 2014. These firms represent sixty seven different industries, seven regions and two legal forms. The most representative industries in our sample are retail trade, wholesale, restaurants and catering, real estate activities, development and building construction.

Figure 1 presents the number of firms created per legal form in the period from 2004 to 2014. Both legal forms followed the same trend of firms' registrations till year 2010. Also, we found high positive correlation of 0,83 (statistically significant at 5%) between the yearly firms registrations of both legal forms before the reform.

Table 5 presents the average number of the firm registrations per year and legal form before and after the reform. On average, before the reform 23 053 new firms were created per year and after the reform this number increased to 23 214 totally for both legal forms. About two thirds of the firms are established in the North and Lisbon regions. The average number of new *Sociedades por Quotas* created per year increased by almost two per cent while the average number of *Sociedades Anónimas* decreased from 852 to 597 new firms. Both legal forms are widespread more in North and Lisbon regions before and after the reform.

[5] Article 276 of Commercial Companies' Code (Código das Sociedades Comerciais), DL n.º 343/98, de 06 de Novembro

Table 6 presents the descriptive statistics. Firms in our sample are small, with two employees on average in *Sociedades por Quotas* and three *in Sociedades Anónimas*. After the reform, the initial size of *Sociedades por Quotas* decreased slightly. The average paid-in capital of *Sociedades por Quotas* decreased significantly in the post-reform period, by 41%, compared to the pre-reform time. In case of *Sociedades Anónimas*, the initial capital mean changed from 339,77 thousand euro before year 2011 to 245,93 thousand euro after, which is counted as 28% decrease. Also, firms created after the reform have less equity and more debt financing. Both legal forms reduce their equity, but debt increases only for *Sociedades Anónimas*. In terms of firms' survival from the firms created in the pre-reform period 95,6% operated for more than one year, for the post-reform newly created firms the one-year survival rate is 93,9%. Survival rates decrease with time for both legal forms.

Table 7 presents the number of *Sociedades por Quotas* according to the amount of initial capital. In the pre-reform time the major part of these firms (about 76%) has initial capital equal to the minimum threshold of five thousands euro previously fixed by law. After the reform the number of new *Sociedades por Quotas* with initial capital less or equal to the previous threshold increased to 85%, about 3% of which have initial capital equal to the new minimum required amount of 1 euro per quota.

6. Methodological Approach, Variables and Results

Our empirical strategy compares how firm entry and capital structure changed after and before the minimum capital requirement reform. To evaluate the effect of the reform on entrepreneurial activity we apply a difference-in difference methodology. This approach implies data for two time periods, before and after the reform, and two groups of analysis, treated and control group. The treated group includes eligible firms, *Sociedades por Quotas*. The control group is formed by non-eligible firms, *Sociedades Anónimas*. We assume that as the control group was not affected by the reform, any possible changes in its data refer to the common trend for both groups. Thus we could use the difference in the control group as an approximation for this trend. Our key identifying assumption is that the firm entry trends would be identical for both legal forms in the absence of the reform.

6.1 Firm Entry

To test our first hypothesis, we estimate the following model:

$$Y_{iy} = \alpha_y + \lambda_n + \theta_j + \rho Treated_i + \beta Policy_{iy} + \varepsilon_{iy} \quad (1)$$

where *i* denotes legal form, *y* is entry year, *n* is region and *j* is industry.

The dependent variable is logarithm of the number of new entries Y_{iy}. The variable α_y controls for the macroeconomic shocks, λ_n refers to the region fixed effect and θ_j is industry fixed effect. $Treated_i$ is a dummy variable equalling one if firm's legal form is affected by the reform, *Sociedades por Quotas,* and zero for *Sociedades Anónimas.*

Our variable of interest is $Policy_{iy}$. It equals one if *Sociedades por Quotas* was established in the post-reform period and zero otherwise. The coefficient β is the

difference-in-difference estimator of interest. It identifies the change in firm entry within *Sociedades por Quotas* legal form that is not represented by the corresponding change in firm entry within non-treated legal form. We expect β to be positive, as in our theory reducing the minimum capital requirement leads to an increase in firm entry.

Column 1 and 2 of Table 8 present our estimates for firm entry excluding the year 2011. The result shows that reducing of the minimum capital requirement is related to an increase of firms' entry of about 15%. The coefficient is statistically significant (with p-value=0,000 and t-value=3,84). Also, we estimate the model including as additional controls logarithm of population and logarithm of gross domestic product per each region and year. The $Policy_{iy}$ coefficient does not change.

For the robustness check we include the year 2011 and present the results in columns 3 and 4 of the Table 8. The $Policy_{iy}$ coefficient does not vary too much despite the sample change. It equals to 0,147, thus, it stays very close to the previous estimation, remains positive and statistically significant.

Panel B of Table 8 reports the results of estimating the impact of the minimum capital requirement reform on jobs creation. We run the regression which is specified by the equation (1), but in this case the dependent variable is logarithm of the initial number of employees. The reform has a positive effect on initial employment. The number of jobs created increases by 14,6% and 14,9% excluding and including the year 2011, respectively. To sum up, the reform is associated with increase in firm entry and creates more jobs.

Next, we analyze which kinds of firms are induced to the market as a result of the reform. Table 9 presents the results for equation (1) with additional controls where the

dependent variable is the number of firms per size. We consider four categories of firms according to the number of initial employees: one, two, from three to five and more than five employees. The reform leads to an increase in the number of smaller firms with one and two employees. For the firms of other sizes the impact of the reform is negative but not statistically significant for firms with more than five employees.

Also, we examine the impact of the reform on the one-year survival rate of the start-ups. We estimate the regression (1) with additional controls where the dependent variable is equal to one if a firm continued its operation after one year from its entry and zero if not. The results are presented in the Table 10. The coefficient on policy equals to -0,01 and is statistically significant at 10% (p-value=0,073). And in the estimation including the year 2011 the policy impact stays negative but is not statistically significant. Thus, the firms established after the reform are slightly less likely to survive than the firms created in its absence.

6.2 *Capital Structure*

To evaluate the impact of the reform on the firms' initial capital structure we use the following model:

$$Y_{fiy} = \alpha_y + \lambda_n + \theta_j + \rho Treated_i + \beta Policy_{iy} + \varepsilon_{iy} \quad (2)$$

where *f* indicates firm level, *i* refers to legal form, *y* matches the year and *n* indicates the region.

The dependent variable is debt-to-equity ratio in the first year of the start-up. The dummy variable $Treated_i$ equals one if the firm belongs to *Sociedade por Quotas* and represents a treatment group and zero if a firm is *Sociedade Anónima* and represents a control group. The variable $Policy_{iy}$ takes the value of one if the firm was created at any

of the post-reform years and has a legal form *Sociedade por Quotas.* In case a firm was created as *Sociedade Anónima* or/and it was created before the reform, the variable $Policy_{iy}$ equals zero. Our coefficient of interest is β which stands for the policy effect. We expect the coefficient to be not statistically significant suggesting that the minimum capital requirement reform did not affect firms' initial capital structure.

The variable α_y denotes year fixed effects, λ_n denotes region fixed effects and θ_j controls for industries fixed effects.

Table 11 reports the regression output. The coefficient of the variable $Policy_{iy}$ is negative (-0,236) but not statistically significant, its p-value is very high (0,961) and t-value is low (-0,05).

When we control for additional firm characteristics such as logarithm of firm's sales and logarithm of initial employees, the coefficient on policy equals to -0,25 and remains not statistically significant with p-value of 0,958 and t-value of -0,05. Thus, the reform does not affect initial capital structure of new firms.

As a robustness check we again estimate equation (2) without and with the vector of firm control variables (logarithm of firm's sales and employees) and include data for the year 2011. Thus, $Policy_{iy}$ is equal to one if *Sociedade por Quotas* was created in the period 2011-2014 and zero otherwise. The coefficients are reported in Column (3) and (4) of Table 11. The $Policy_{iy}$ coefficient increases to 0,2 but remains not statistically significant with very high p-value of 0,96. Thus, the minimum capital reform does not affect initial capital structure of new firms when we included the year 2011.

Next, we analyze the impact of the reform to the amount of initial capital, the amount of equity and the amount of debt in the year of firm's entry. We estimate the tobit

regression described by equation (2) for the logarithm of initial capital and the logarithm of debt as dependent variables. For the dependent variable logarithm of equity we apply OLS regression with the same equation (2). The results are presented in the Table 11 for the estimations without and with control variables, excluding and including the year 2011.

With the reform, the amount of the paid-in capital of new firms decreases by 1,15. The coefficient remains negative and statistically significant (p-value=0,000) when we include the controls and the year 2011. Thus, the reform induces firms to have less amount of initial capital than the amount paid-in by newly formed firms in the absence of the reform.

Regarding the impact of the reform on the debt amount, it decreases by 2,6. The change in equity caused by the reform is also estimated to be negative. The coefficient on policy equals minus 0,45 and is statistically significant. The similar affects remain with addition of controls and of the year 2011 to the corresponding estimations. So the reform leads to less equity and even less debt amount in the first year of firms' operation.

7. Conclusion

In this work we analyze the effect of the minimum capital requirement reform on entrepreneurial activity. The reform significantly lowered the minimum capital required to create firms with legal form *Sociedade por Quotas* in Portugal. Using a firm level data from the Simplified Corporate Information database (SCIE) we perform the difference-in-difference analysis to find how the reform influenced firms' creation and initial capital structure.

As it was expected, reducing of the minimum capital requirement stimulates start-up activity. We find that the reform is associated with an increase in the firms' entry by approximately 15%. The same positive effect the reform has on the initial number of jobs created by start-ups. The reform is especially related to an increase in the number of firms with one and two employees. But lowering the minimum capital requirement does not affect the initial capital structure of start-ups. Our analysis reveals no statistically significant relation between the reform and debt-to-equity ratio of the new firms. However, the reform has impact on the initial capital and first year debt and equity amounts of newly established firms. After the reform firms put less initial capital, have less debt and less equity financing than firms formed in the absence of the reform.

Although we observe an increase of firm entry due to the reform, because of data limitations we do not evaluate their quality except one-year survival rate. We find that the firms created after the reform are approximately one percentage point less likely to survive than the firms created in its absence. It may still occur that the newly created firms are marginal firms with poor performance. It may be useful to trace the performance of the post-reform eligible start-ups as well as to examine founders' characteristics. Among the limitations of our work there is also the fact that our data is

on a year basis. Considering that we know the exact date of the reform implementation, the information on the month of a firm entry could have helped us to construct better sample as well as to control the possible seasonality in the firms' entries or to define the reform's immediate effect. Moreover, as the reform was introduced relatively recently, we manage to determine its short term impact, while the long-run consequences remain unstudied.

Nevertheless, our results are in line with the existing literature about the positive impact of lowering the minimum capital requirement on entrepreneurial activity and employment. The fact that the reform induces firms' entry and job creation provides evidence that reducing the minimum capital requirement might be a possible instrument to promote entrepreneurship, stimulate labor market, facilitate competition and favor business activity. Furthermore, as the reform does not affect the new firms' capital structure, we can infer that the initial stock does not reflect the creditworthiness of the start-up and debt holder willingness to lend. With no effect on debt-to-equity ratios, the reform does not affect financial stability of firms and their risk profile. Lower equity and debt amounts in the first year of operation indicate lower financing needs of the post-reform firms which correspond to their smaller size. In addition, having the right to choose the amount of capital invested into a new firm, founders put less initial capital, meaning that the previous minimum threshold defined by law was somehow burdensome.

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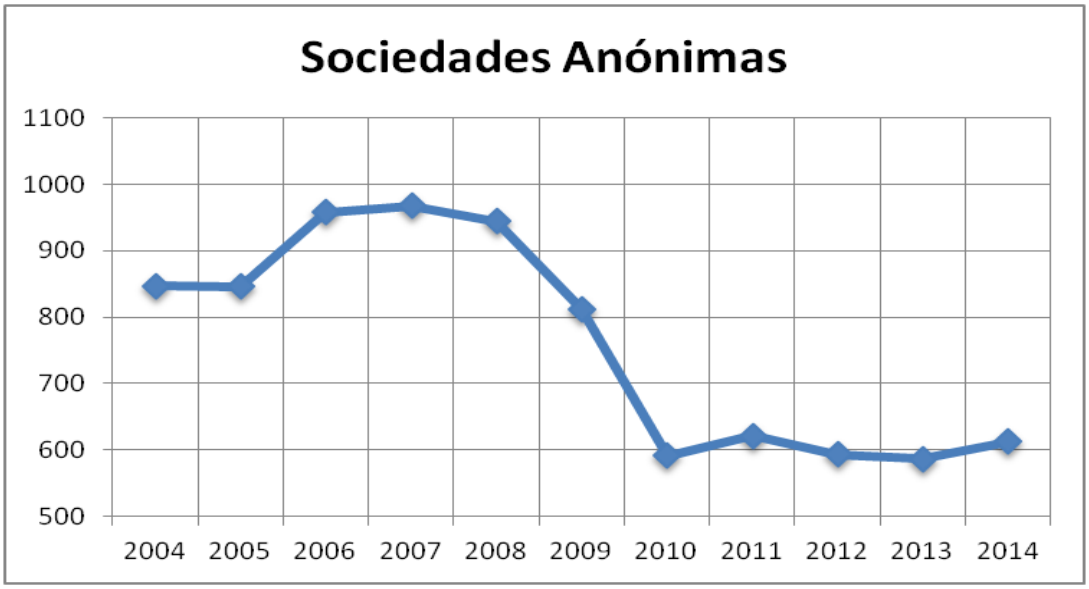
Figures

Figure 1: Number of registrations per legal form in the period from 2004-2014



(a)

(b)

Tables

Table 1: Summary of the empirical evidence on entry reforms

Author	Country	Reform	Main Results
Monteiro and Assuncao (2006)	Brazil	introduction of SIMPLES sistem which implies bureacracy simplification and tax reduction, reducing costs of being formal	no significant effect on firms formalization in general, but increase in official registrations of firms in retail sector and positive impact on investment
Mullainathan and Schnabl (2010)	Peru	decrease in time and costs of licensing procedures	increase in the number of licensed firms both previously operated in informal sector and newly created firms
Bruhn (2011)	Mexico	entry process simplification by implementing Rapid Business Opening System and reducing number of registration procedures	increase in firm creation due to former wage employees opening new firms; increase in job creation and competition; decrease in income of incumbent firms
Yakovlev and Zhuravskaya (2013)	Russia	reduction of regulatory burden, decrease of costs of licensing, registration and inspection	better performance of small firms and increase of the small business formal sector in regions with good government institutions
Branstetter *et al.*(2014)	Portugal	reduction of time and costs of setting up a company and creation of one-stop shop registration procedure	increase in employment and in number of start-ups; new firms mostly appear in non-tech industries, are small and less likely to survive within first two years of operation

Becht *et al.*(2008)	The UK	elimination of the minimum capital requirement	increase of new foreign firms incorporations from the EU in the UK due to absence of minimum capital requirement and low entry costs
Ringe, 2013	Germany	introduction of a new legal form (Unternehmergesellschaft) with 1 euro of minimum capital at the time of start-up	no significant impact on the UK incorporations by German entrepreneurs, which decrease had been already observed even before the reform and could be explained by other reasons
Hornuf, 2012; Braun et al., 2011	France, Germany, Poland, Hungary, Spain	reduction or abolishment of minimum capital requirement	increase in LLCs incorporations and promotion of start-up activity in general

This table is based on the existing literature and provides a summary of the empirical evidence on the entry deregulation reforms including reduction of the time, costs, number of procedures and minimum capital required to register a business.

Table 2: The Summary of The Minimum Capital Reform in Portugal

The Law Nº33/2011 of the 7th March 2011	
Purpose	The law aims to lower costs of creating a company, to promote entrepreneurship and employment
Content	The law reduces the minimum capital requirement from 5000 euro to 1 euro per quota
Application	The law is applied to *Sociedade por Quotas* and *Sociedade Unipessoal por Quotas*
Exceptions	The firms which type of activity is regulated by special laws or licensing are not eligible to the law

This table presents the main points of the new minimum capital requirement legislation as of 7th of March 2011.

Table 3: Non eligible industries for the minimum capital reform

Sector of activity	Minimum capital, Euro	Source
Travel and Touristic Agencies	100 000	Decreto -Lei n.º 90/2002, de 11 de Abril, Decreto-Lei n.º 61/2011, de 6 de maio
Road Passenger Transport	100 000	Decreto-Lei nº 3/2001 de 10 de Janeiro de 2001
Construction and Public Works	equity equal or more than 10% of the threshold value of the corresponding class	Decreto-Lei nº 59/99, de 02 de Março, Decreto-Lei nº 69/2011, de 15 de Junho
Taxi Transport	1 000	http://www.imtt.pt/sites/imtt/Portugues/TransportesRodoviarios/transportetaxi/licenciamentoempresas/Paginas/LicenciamentoEmpresas.aspx
Road Freight Transport	50 000 for cars and 125 000 for trucks	Decreto-Lei n.º 136/2009, de 5 de Junho
Industry of Motor Vehicles Rent	50 000	Decreto-Lei 77/2009 de 1 de Abril , Altera (terceira alteração) o Decreto-Lei n.º 354/86, de 23 de Outubro
Private Security	starting from 50 000	Lei n.º 34/2013 de 16 de maio
Sports Societies	starting from 5 000	Decreto-Lei n.º 10/2013, de 25 de janeiro
Credit Institutions and Financial Companies	amount of capital not less than 100 000 - 17 500 000 EUR depending on the type	https://dre.tretas.org/dre/313102/ Portaria 335/2013 de 15 de novembro

This table provides a summary of minimum capital needed to register a business based on the existing legislation for particular types of activity. The activities presented in this table are not eligible to the minimum capital reform.

Table 4: Main Characteristics of *Sociedade por Quotas* and *Sociedade Anónima*

	Sociedade por Quotas	**Sociedade Anónima**
Minimum Capital Requirement, EUR		
Pre-reform	5 000	50 000
Post-reform	1	50 000
Minimum Number of Shareholders	2 or 1 (in case of *Unipessoal*)	5
Type of Liability	Limited Liability	Limited Liability

This table presents the main characteristics of firms of two legal forms: *Sociedade por Quotas* and *Sociedade Anónima*, the amount of initial minimum capital in euro required by law, the minimum number of founders-shareholders and the type of liability.

Table 5: Summary Statistics - Average Number of New Firms Created per Year by Legal Form and by Nuts

	Sociedades por Quotas	Sociedades Anónimas	Total
Total			
Pre-reform	22 201	852	23 053
Post-reform	22 617	597	23 214
Change	1,87%	-29,95%	0,70%
Region (NUTS2)			
North			
Pre-reform	7 531	290	7 821
Post-reform	8 399	224	8 623
Change	11,52%	-22,64%	10,25%
Lisbon			
Pre-reform	7 315	367	7 682
Post-reform	7 510	247	7 758
Change	2,60%	-48,44%	0,97%
Center			
Pre-reform	4 071	106	4 178
Post-reform	3 844	87	3 930
Change	-5,59%	-18,46%	-5,92%
Algarve			
Pre-reform	1 259	35	1 295
Post-reform	1 061	11	1 072
Change	-15,78%	-68,70%	-17,22%
Alentejo			
Pre-reform	1 123	30	1 153
Post-reform	1 048	16	1 064
Change	-6,67%	-46,67%	-7,71%
Madeira			
Pre-reform	624	15	639
Post-reform	454	8	462
Change	-27,26%	-47,17%	-27,74%
Azores			
Pre-reform	277	9	286
Post-reform	302	4	306
Change	8,96%	-55,56%	6,93%

This table presents the average number of new firms created per year before (2004-2010) and after the reform (2012-2014). The total average number of new firms established per year in each period is splitted by two legal forms (*Sociedade por quotas* and *Sociedade Anónima*) and also by seven regions of NUTS2 classification.

Table 6: Descriptive Statistics of New Firms' Characteristics

	Sociedades por Quotas		Sociedades Anónimas		Total	
	Pre-reform	**Post-reform**	**Pre-reform**	**Post-reform**	**Pre-reform**	**Post-reform**
Size						
Mean	2,37	2,15	3,40	3,57	2,41	2,19
Std Dev	4,15	3,88	9,34	17,45	4,46	4,75
Initial Capital						
Mean	16,78	9,84	339,77	245,93	28,72	15,91
Std Dev	324,94	120,50	4172,61	1451,81	865,65	264,05
Equity						
Mean	17,54	13,80	597,24	398,42	38,97	23,69
Std Dev	599,71	271,23	8541,34	2805,68	1747,86	526,99
Debt						
Mean	17,30	17,53	548,16	964,54	36,93	41,88
Std Dev	671,93	298,50	7731,69	5427,62	1629,27	930,85
Net Income						
Mean	-3,87	-2,56	-42,70	-37,79	-5,31	-3,47
Std Dev	108,85	55,50	595,16	612,69	156,70	112,61
Debt-to-Equity						
Mean	0,21	-1,38	2,71	0,20	0,31	-1,34
Std Dev	156,47	646,17	123,09	108,05	155,36	638,05
Survival						
Mean	0,955	0,938	0,974	0,967	0,956	0,939
Std Dev	0,21	0,24	0,16	0,18	0,21	0,24
Observations						
Survival	155 408	43 910	5 966	1179	161 374	45 089
Other variables	155 408	67 851	5 966	1 791	161 374	69 642

This table gives descriptive statistics (mean and standard deviation) of firms' characteristics. Pre-reform period is from 2004 to 2010, post-reform period is from 2012 to 2014. Size is initial number of employees; initial capital, net income, equity and debt are in thousands euro; the debt-to-equity ratio is calculated by dividing total debt amount to the amount of equity of a firm; survival is a one-year survival rate calculated not considering the firms created in the year 2014; observations are the number of observations for each category per corresponding period.

Table 7: Number of new Sociedades por Quotas by the amount of Initial Capital

Initial Capital	Pre-reform	Post-reform
from 1 to 2		
	-	**2 200**
	-	3,2%
from 3 to 1000		
	-	**22 313**
	-	32,9%
from 1001 to 2000		
	-	**3 817**
	-	5,6%
from 2001 to 3000		
	-	**3 868**
	-	5,7%
from 3001 to 5000		
	117 783	**25 509**
	75,9%	37,6%
from 5001 to 50 000		
	31 791	**8 848**
	20,5%	13,0%
more than 50 000		
	5 657	**1 296**
	3,6%	1,9%
Total		
	155 231	**67 851**
	100,0%	100,0%

This table provides the number of newly formed *Sociedades por Quotas* according to the amount of initial capital in pre-reform and post-reform time. In the pre-reform time non of the presented firms have capital less than 5000 euro. The number of firms are accompanied by the corresponding percentage in the total number of *Sociedades por Quotas* in each period.

Table 8: Impact of the Minimum Capital Requirement Reform on Firms' Entry and Jobs Creation

	Excluding 2011		Including 2011	
	(1)	(2)	(3)	(4)
Panel A: Firm Entry				
Minimum Capital reform (Policy=1)	0,150***	0,150***	0,147***	0,147***
	(0,0391)	(0,0391)	(0,0353)	(0,0353)
Control Variable for Population	-	-0,577	-	-0,649
	-	(0,440)	-	(0,424)
Control Variable for GDP	-	0,0989	-	0,0428
	-	(0,517)	-	(0,498)
Observations	9 380	9 380	10 472	10 472
Adj. R-squared	0,723	0,723	0,719	0,719
Panel B: Jobs Created				
Minimum Capital reform (Policy=1)	0,146***	0,146***	0,149***	0,149***
	(0,0490)	(0,0490)	(0,0441)	(0,0441)
Control Variable for Population	-	-0,557	-	-0,581
	-	(0,563)	-	(0,542)
Control Variable for GDP	-	0,326	-	0,287
	-	(0,652)	-	(0,627)
Observations	9 380	9 380	10 472	10 472
Adj. R-squared	0,699	0,699	0,696	0,696

This table presents the outputs of OLS regressions: columns (1) and (2) report the difference-in-difference estimators for the sample period without the year 2011 and columns (3) and (4) report the difference-in-difference estimators for the sample period including 2011. The coefficients for $Treated_i$ and for the region, year and industry fixed effects are not reported. Robust standard errors are in parentheses and *, **, *** indicate statistical significance at 10 percent, 5 percent and 1 percent level respectively.

Table 9: Impact of the Minimum Capital Requirement Reform on Firms Entry by Firms' Size

	One Employee	**Two Employees**	**Three to Five Employees**	**More Than Five Employees**
	(1)	(2)	(3)	(4)
Firm Entry				
Minimum Capital reform (Policy=1)	0,170***	0,0231	-0,0552*	-0,0336
	(0,0372)	(0,0314)	(0,0295)	(0,0245)
Observations	9 380	9 380	9 380	9 380
Adj. R-squared	0,693	0,557	0,545	0,491

This table presents the outputs of four regressions (OLS) where the dependant variable is the logarithm of the number of new firms of the following sizes accordingly: with initial number of employees equal to one, two, from three to five and more than five. The coefficients for $Treated_i$ and for the region, year and industry fixed effects are not reported. Robust standard errors are in parentheses and *, **, *** indicate statistical significance at 10 percent, 5 percent and 1 percent level respectively.

Table 10: Effect of the Minimum Capital Reform on the Firms' Survival

	Excluding 2011	**Including 2011**
	(1)	(2)
Survival		
Minimum Capital reform (Policy=1)	-0,0103*	-0,00787
	(0,00576)	(0,00510)
Observations	206 463	230 445
Adj. R-squared	0,00704	0,00788

This table presents the outpu of the OLS estimation of the impact of the reform on the new firms' survival. The dependent variable is one-year survival rate. The last year 2014 is not included into the regressions. Robust standard errors are in parentheses and *, **, *** indicate statistical significance at 10 percent, 5 percent and 1 percent level respectively.

Table 11: Impact of the Minimum Capital Requirement Reform on New Firms Initial Capital Structure

	Excluding 2011		**Including 2011,**	
	(1)	(2)	(3)	(4)
Debt-to-equity				
Minimum Capital reform (Policy=1)	**-0.236**	**-0.250**	**0.224**	**0.200**
	(4.772)	(4.783)	(3.962)	(3.979)
Sales		0.158		0.161
	-	(0.171)	-	(0.157)
Size		-0.338		-0.303
	-	(0.430)	-	(0.394)
Initial Capital				
Minimum Capital reform (Policy=1)	**-1.149*** **	**-1.145*** **	**-1.038*** **	**-1.038*** **
	(0.0351)	(0.0348)	(0.0334)	(0.0331)
Sales		-0.0236***		-0.0224***
	-	(0.000661)	-	(0.000672)
Size		0.283***		0.294***
	-	(0.00426)	-	(0.00433)
Debt				
Minimum Capital reform (Policy=1)	**-2.618*** **	**-2.582*** **	**-2.331*** **	**-2.357*** **
	(0.436)	(0.429)	(0.397)	(0.392)
Sales		0.204***		0.191***
	-	(0.00945)	-	(0.00889)
Size		2.624***		2.653***
	-	(0.0560)	-	(0.0528)
Equity				
Minimum Capital reform (Policy=1)	**-0.448*** **	**-0.451*** **	**-0.371*** **	**-0.385*** **
	(0.0394)	(0.0396)	(0.0350)	(0.0353)
Sales		0.0385***		0.0400***
	-	(0.000932)	-	(0.000901)
Size		0.327***		0.327***
	-	(0.00590)	-	(0.00568)

This table reports the outputs of the OLS and tobit regressions where the dependant variables are the debt-to-equity ratio of the start-ups, logarithms of initial capital, equity and debt of the new firms in the entry year. Column (1) and (3) refer to the estimation without the additional controls (logarithm of sales and logarithm of number of employees). The coefficients for $Treated_i$ and for the region, year and industry fixed effects are not reported. Robust standard errors are in parentheses and *, **, *** indicate statistical significance at 10 percent, 5 percent and 1 percent level respectively.