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Lending infrastructure and credit rationing of European SMEs

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LENDING INFRASTRUCTURE AND CREDIT RATIONING OF EUROPEAN SMES

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Lending Infrastructure and Credit Rationing of European SMEs*

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Abstract

We examine the influence of countries lending infrastructure on credit rationing for European SMEs (small and medium sized enterprises). This lending infrastructure, conceptualised by Berger and Udell (2006) is comprised of countries information, legal, judicial, bankruptcy, social and regulatory environments. Using a sample of 13,957 SMEs from eleven European countries, we find that SMEs in countries with more efficient judicial systems, less efficient bankruptcy systems and with greater levels of trust are less likely to be credit rationed. Interestingly, the lending infrastructure provides greater explanatory power for those firms classed as either weakly rationed or faced with unfavourable loan terms in contrast to those deemed strongly rationed. The paper also shows some variation in the results across different sub-samples, considering firm size, age and riskiness. We also exploit the variation between core and periphery European countries and the peculiarity of the sovereign debt crisis period.

JEL Codes: G20, G28

Keywords: SMEs, Lending Infrastracture, Credit Constraints

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Abstract

We examine the influence of countries lending infrastructure on credit rationing for European SMEs (small and medium sized enterprises). This lending infrastructure, conceptualised by Berger and Udell (2006) is comprised of countries information, legal, judicial, bankruptcy, social and regulatory environments. Using a sample of 13,957 SMEs from eleven European countries, we find that SMEs in countries with more efficient judicial systems, less efficient bankruptcy systems and with greater levels of trust are less likely to be credit rationed. Interestingly, the lending infrastructure provides greater explanatory power for those firms classed as either weakly rationed or faced with unfavourable loan terms in contrast to those deemed strongly rationed. The paper also shows some variation in the results across different sub-samples, considering firm size, age and riskiness. We also exploit the variation between core and periphery European countries and the peculiarity of the sovereign debt crisis period.

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1 Introduction

Although not a new phenomenon, credit rationing which largely stems from loan market imperfections and/or information asymmetry, has commanded more attention in recent years (Cenni et al., 2015). Such rationing is more prevalent amongst SMEs (small and medium sized enterprises) due to the significant problems of information asymmetry and opaqueness, inherent to these firms (Berger and Udell, 2006). European SMEs in particular, suffered between 2008 and 2013 after the 35% drop in new bank credit issued (Bremus and Nueugebayer, 2018). Their strong reliance on bank finance exacerbated this problem even further (Freel et al., 2012; Popov and Udell, 2012; Kelly et al., 2015) and is recognized by the European Commission in their Capital Market Union plan (Veron and Wolff, 2016).

Exactly why firms experience this rationing has been investigated primarily using firm, industry or banking structures (Berger and Udell 2002; Canton et al., 2013; Ryan et al., 2014). Less is known about the significance of countries lending infrastructure on credit rationing with much of the focus to date on macroeconomic conditions (Holton et al., 2013) and bank versus market-based systems (Baum et al., 2011). Defined by Berger and Udell (2006) as the rules and conditions in countries which underpin financial institutions ability to lend, no study has to date examined the lending infrastructure and the implications of it for credit rationing. Comprised of countries information, legal, judicial, bankruptcy, social and regulatory environments, the purpose of this study is to analyse these environmental settings on credit rationing of European SMEs. Greater sharing of credit information, more legal rights and more efficient bankruptcy and judicial systems result in a stronger lending infrastructure which may enhance SME credit availability whilst weaker infrastructures may have an adverse impact on credit availability (Berger and Udell, 2006).

Credit rationing can manifest in different forms; weak rationing, whereby firms receive only part of the credit sought, (Cieply and Dejardin, 2010; Drakos and Giannakopoulos, 2018) and strong rationing, whereby firms are rejected and denied credit altogether (Cenni et al., 2015; Demoussis et al, 2017). Firms may also be rationed having (a) been granted credit but refuse to take it up due to its high cost or (b) they receive only part of the credit sought (weak rationed), the latter two classed as rationed due to unfavourable loan terms by Kysucky (2015).

We test for the presence of each of these three forms of SME credit rationing across eleven European countries from 2010 to 2014 and the impact of these countries lending infrastructures on the likelihood of SMEs being credit rationed, having controlled for firm characteristics, macroeconomic and credit supply conditions. By using the 2010-2014-time frame, we are able to capture the 2011 sovereign debt crisis experienced by some European countries which we test the impact of this in a sub-sample. We find that

European SMEs experience varying degrees of credit rationing which is partly explained by their countries lending infrastructure. Noticeably, rationing is less prevalent for SMEs in countries with more efficient judicial systems, higher trust levels and with less efficient bankruptcy regimes. These results hold with the use of alternative measures of the lending infrastructure and when clustered by wave. Interestingly, for strongly rationed SMEs, greater sharing of credit information, a more inefficient bankruptcy system and a less stringent bank regulatory regime increases the likelihood of being rationed. The lending infrastructure offers much more explanatory power for weak rationed and those subject to unfavourable loan terms. For both of these, greater sharing of credit information, fewer legal rights, more inefficient judicial systems, lower levels of trust and stricter bank capital regulatory regimes result in a greater likelihood of being rationed.

We also consider possible non-linearity in our results. Greater sharing of credit information reduces the chances of larger and younger firms being rationed. By contrast, credit information sharing increases the likelihood of rationing during the period of the sovereign debt crisis. Legal rights matter more for larger and older firms in reducing the probability of being rationed. Efficient bankruptcy systems sees younger firms less likely to be rationed in contrast to their older, larger and less risky counterparts where such efficiency sees them more likely to be rationed. Equally, efficient judicial systems lowers the likelihood of rationing for larger and younger firms as well as those in the periphery European countries. Higher trust levels means less rationing in almost all sub samples with a few exceptions.

Our paper contributes to several research strands. First, by analysing these forms of credit rationing and constraint, weak, strong and unfavourable loan terms, we present a more comprehensive insight into credit rationing, building on the work of Cieply and Dejardin (2010); Demoussis et al. (2017); Drakos and Giannakopoulas (2018) and Kysucky (2015). Second, we draw on the law and finance literature of La Porta et al. (1997, 1998); Djankov et al. (2003, 2008) and more specifically on the work of Haselmann and Wachtel (2010) and Moro et al. (2018) by testing the impact of countries institutional setting on credit availability. Using Berger and Udell's (2006) lending infrastructure as a proxy for countries institutional setting is not only novel but also captures country characteristics more holistically as along with the legal environment, we also encompass countries information, judicial, bankruptcy, social and regulatory environments. In so doing we capture the effect of both formal and informal institutions on credit rationing and build on the work of Moro et al., (2018) whose analysis is confined solely on the impact of the legal and judicial environments on European SME credit rationing. Finally, our study is timely given the crucial role of European SMEs for economic growth and employment (Love and Roper, 2015; European Commission, 2017) together with the challenges in

their funding landscape, due to the severity of the recent European sovereign debt crisis (Wehinger, 2014). Europe is an interesting context as it is strongly bank based (Langfield and Pagano, 2016) but with diversity in its institutional and macroeconomic environment (Casey and O Toole, 2014; Mc Namara et al., 2017).

The paper is organised as follows. Section 2 presents the theoretical background and hypotheses to be tested. Section 3 describes the data, methodology, variables employed and summary statistics. Finally, the results are reported in Section 4 and Section 5 concludes.

2 Theoretical Background and Hypotheses

The infrastructure underpinning financial transactions influences credit availability, especially so for SMEs (Beck and Demirgüç, 2006). Berger and Udell (2006) identify a causal chain between countries government policies, structure of their financial institutions and their lending infrastructure which subsequently influences the availability of credit to SMEs. The structure of financial institutions in terms of their size, ownership and market power influence the feasibility and profitability of different lending technologies, i.e asset-based lending, factoring, fixed-asset lending, leasing, relationship lending and trade credit. Notwithstanding, the importance of these various lending technologies it is the lending infrastructure which creates the conditions which in turn influences the lending capability of these institutions. It is this lending infrastructure which is the subject of this paper. Government policies influence bank size and ownership thereby moulding the structure of these institutions and their competitiveness. These polices also influence a country's lending infrastructure (Berger and Udell, 2006).

The first component of the lending infrastructure is the information environment. Information sharing helps alleviate two of the main challenges in credit markets: adverse selection and moral hazard for banks (Pagano and Jappelli, 1993; Padilla and Pagano, 2000). Information is important for assessing firms' creditworthiness and limited or inaccurate information can impinge on firms' access to bank credit (Berger and Frame, 2007; Mason and Stark 2004, Moro et al., 2014 and Petersen and Rajan, 1994). Enhancements in the credit information environment may be particularly important for SMEs, to help overcome information asymmetries and to increase the flow of finance to them (Fraser et al., 2015). Private credit bureaus and public credit registries facilitate the exchange of information between lenders and borrowers, thereby strengthening the efficient allocation of resources (Jappelli and Pagano, 2002). Moreover, this exchange of credit data encourages a more robust due diligence process for lenders, thwarting the existence of asymmetric information (Kallberg and Udell, 2003). Love and Mylenko (2003) posit such information

sharing results in increased lending and subsequently less credit rationing for borrowers. Information sharing makes lending safer for lenders; hence credit rationing is less likely for borrowers (Bennardo et al., 2015). Furthermore, this sharing amongst both current and potential lenders imposes a disciplinary effect on firms making it more expensive for them to default (Doblas-Madrid and Minetti, 2013). In a similar vein, credit information sharing helps in the assessment of the default risk of private firms. Dierkes et al. (2013) find support for this in the context of German private firms where the sharing of business credit information led to more accurate aggregate and firm specific default predictions. Predicting future default rates results in better resource allocation with financially stronger firms securing credit.

In contrast, however, greater information sharing can reduce lending (Brown et al., 2009) depending on the quality of the borrower. Disclosure of 'black' or default information about a borrower can adversely impinge their credit rating, resulting in a greater likelihood of credit rationing (Padilla and Pagano, 2000). Lending decisions can become more sensitive to credit information revealed in a credit register as illustrated by Hertzberg et al., (2011) in Argentina where an expansion of credit sharing from private credit bureaus to a public registry resulted in a reduction in lending to borrowers with multiple lenders, (Hertzberg et al., 2011). Such sharing sees lenders incentivised to coordinate their lending decisions resulting in a reduction in credit exacerbated by the fact that firms borrow from fewer banks. Having controlled for borrower quality, H1 suggests:

H1. SMEs in countries with less sharing of credit information are more likely to be credit rationed.

Key to the effective functioning of credit markets is the legal system in a country (La Porta et al., 1997, 1998; Levine et al., 2000; Moro et al., 2018). Subsequently, the legal environment constitutes the second component of the lending infrastructure. Greater protection rights afford lenders access to collateral in the event of default (Haselmann et al., 2010). A positive relationship between creditor protection and credit access has been found by Jappelli et al. (2005); Qian and Strahan (2007); Deakin et al. (2010) and Haselmann et al. (2010). A strong legal environment is especially important for SME lending (Haselmann et al., 2010). Hence, consistent with Armour et al. (2009) 'quality of law hypothesis', H2 suggests:

H2. SMEs in countries with fewer legal rights are more likely to be credit rationed.

Yet, higher quality laws alone may not enhance credit access with judicial enforcement of laws even more pertinent (Bhattacharya and Daouk, 2009). Subsequently, the judicial environment constitutes the third component of the lending infrastructure. Weak judicial law enforcement tends to increase the risk of borrowers engaging opportunistically, resulting in lenders restricting credit (Jappelli et al., 2005; Bae and Goyal, 2009; Ippoliti

et al., 2015 and Moro et al., 2018). Arellano et al. (2007) contend that weak enforcement negatively affects credit availability for small firms. Hence, H3 suggests:

H3. SMEs in countries with more inefficient judicial environments are more likely to be credit rationed.

In addition to the legal and judicial environments, countries bankruptcy regimes matters for the efficient functioning of financial markets (Beck et al., 2005; Hernández-Cánovas and Koëter-Kant, 2011 and Mac an Bhaird et al., 2016). This regime determines the enforcement of bankruptcy resolutions (Berger and Udell, 2006; Gormley et al., 2018). Subsequently, the bankruptcy environment represents the fourth component of the lending infrastructure. Not only will it provide for timely and cost-effective resolution to financial distress for lenders but also reinforce healthy debt repayment by borrowers, thereby encouraging lending (Nigam and Boughanmi, 2017). A more efficient bankruptcy regime is conducive to enhancing credit availability as lenders have greater power and reassurance (Succurro, 2012, Gouveia et al., 2017). Stronger guarantees emanate from more efficient bankrupt regimes making access to credit easier (Calvino et al., 2016). Hence, H4 suggests:

H4. SMEs in countries with more inefficient bankruptcy environments are more likely to be credit rationed.

Countries social environment can affect SMEs credit availability as social capital and trust may assist with contract enforcement (Berger and Udell, 2006). The social environment is the fifth component of the lending infrastructure. Framed as an informal institution, social trust complements formal institutions. Cooperation and trust are integral for market transactions and exchange especially when asymmetric information persists (Hasan et al., 2017) as is the case for SMEs. Trust helps reduce agency problems (Ring and Van de Ven, 1992), lowers monitoring costs and the number of defaults (Lewicki et al., 1998; Moro at al., 2012). Higher levels of trust is said to encourage trustworthy behaviour (Nooteboom, 2002) whilst a trusting relationship can benefit banks and SMEs (Howorth and Moro, 2006). Hence, H5 suggests:

H5. SMEs in countries with lower levels of trust are more likely to be credit rationed.

The regulatory regime forms the last component of Berger and Udell's (2006) lending infrastructure. Regulation of bank capital is a central pillar to the regulatory process. Higher capital requirements encourage banks to curtail lending especially to riskier firms (Berger and Udell, 1994). Stricter capital requirements increase costs for banks from holding higher capital buffers. This has resulted in a reduction in bank credit growth in Europe (Brun et al., 2013; Mesonnier and Monks, 2014; Van der Veer and Hoeberichts, 2016; Fraisse et al., 2017). Yet stricter regimes result in greater capital buffers for banks to absorb risk (Klomp and de Haan, 2015), better risk management by banks and consequentially credit being extended to firms (Jimenez et al., 2017). Globally, bank regulatory

regimes were tightened after the 2007-08 crisis to make banks more resilient and safer (Fratzscher et al., 2016) which in turn may enhance credit availability. However, Bridges et al. (2014) illustrate how increases in banks regulatory capital requirement in the UK resulted in a decline in loan growth given the requirement by the European Banking Authority in 2011 for a subset of European banks to increase their capital. This suggests a possible different effect of the change in capital requirement in respect of the level of capital. Hence, H6a and H6b suggest:

H6a: SMEs in countries with more stringent bank capital regulatory regimes are less likely to be credit rationed.

H6b: SMEs in countries which have experienced an increase in bank regulatory capital requirements are more likely to be credit rationed.

3 Data and Empirical Methodology

3.1 Empirical model and data description

To test our hypotheses, we start building an empirical model that estimates the probability of credit rationing. Thus, we can model the probability of rationing as:

$$\mathrm{P}(Credit_rationing_{it} = 1 | R_i, Z_i) = \Phi\left(\alpha_1 + R_{it}\beta_1 + Z_{it}\gamma_1 + \varepsilon_{1i}\right), \tag{1}$$

where $\Phi(.)$ is the standard normal cumulative density function, $Credit_rationing$ denotes, alternatively, one of the credit rationing indicators described in section 3.2, R_{it} is a vector of proxies for the countries lending infrastructure, and Z_{it} is a vector of control variables including macroeconomic and credit supply conditions and firm characteristics, ε_{1i} is the error term.

Our main data source is the EC/ECB Survey on the Access to Finance of Enterprises (SAFE, ECB, 2016). This survey is conducted by the European Central Bank (ECB) and the European Commission, the first wave of which was in June-July 2009. Part of this survey is conducted by the ECB every six months to record the financial conditions facing SMEs, whilst the more complete survey is conducted every year (since 2013) with the assistance of the European Commission. This survey has largely been used to study firms' credit constraints (see, e.g., Bremus and Neugebauer, 2018; Ferrando et al., 2017; Holton et al., 2014). The data consist of a representative sample, which includes randomly selected firms from the Dun and Bradstreet database 'stratified by country, enterprise size class and economic activity' (ECB 2018, pp.6). The sample size of each country is based

on a compromise between survey cost and the representativeness of the country.[1] The sample of firm size class facilitates a comparison of micro (1-9 employees), small (10-49 employees) and medium-sized (50-249 employees) enterprises, where total employment of the size classes is considered. The sample includes firms from four significant economic activities: industry, construction, trade and other services. A total of eight waves of the SAFE survey is used in this study, corresponding to the time period, March 2010 to March 2014. Earlier and later waves were omitted due to data inconsistencies. Moreover, our time frame covers both the onset and aftermath of the sovereign crisis in Europe. Initially, the sample included data from the chosen eight waves. This constituted 72,974 firm observations across 28 countries. To ensure a complete dataset, firms which did not indicate the level of credit constraints facing them were omitted, resulting in a final sample of 13,957 firm observations from eleven countries (i.e., Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain).

Table 1 reports the summary statistics for the entire sample and across the three key forms of rationing. Up to 82.2 per cent of firms in our sample are more than 10 years old, and 57.6 per cent of them have fewer than 50 employees (while 10.7 percent of the firms have more than 250 workers). Approximately 40.3 per cent of firms experienced an increase in turnover over the past six months (depending on survey wave), whilst 34.9 per cent indicated an increase in their debt ratio. Our sample largely consists of firms located in Italy (17.9 per cent of the total), France (17.5 per cent), Spain (17.4 per cent) and Germany (12.8 per cent). In terms of industry distribution, 51.4 per cent of firms are in the Manufacturing and mining sectors, 28.2 per cent are in the Wholesale or retail trade, 9.6 per cent are in Construction and 10.8 per cent are in Other services.

3.2 Variables

Following a large literature on credit rationing, we construct our proxy of financial constraints using a survey (Angelini and Generale, 2008; Minetti and Zhu; 2011; Murro and Peruzzi, 2019). In particular, our proxy for credit rationing is derived from question 7(b) of the SAFE survey (See Appendix 1). The type of financing which is of interest is bank loans (new or renewal, excluding overdrafts and credit lines). The rationale for this lies in the maturity and duration of bank loans which are perceived to have longer maturity and duration with greater contractual obligations and screening procedures attached in contrast to bank overdrafts. Hence, lending infrastructures may be more relevant for bank loans, justifying the choice. We define as credit rationed (Rationing) firms that answered 'applied and only got a limited part of it [between 1% and 74%]', 'applied but were rejected'

[1] Weights are also applied to 'restore the proportions of the economic weight of each size class, economic activity and country' (ECB 2018, pp. 11).

or 'applied but refused because the cost was too high'. This is consistent with Casey and O'Toole (2014). As a robustness check, we define also other three measures of rationing. Weak rationed are those who 'applied and only got a limited part of it [between 1% and 74%]' consistent with Cieply and Dejardin (2010); strong rationed are those who 'applied but was rejected', similar to Demoussis et al. (2017). Finally, we define unfavourable loan terms as firms which 'applied and only got a limited part of it [between 1% and 74%]' or 'applied but refused because the cost was too high', similar to Kysucky (2015). On average 21.7% of firms are credit rationed; 31% are weak rationed, 11.3% strong rationed and 33.2% suffer unfavourable loan terms. The independent variables used include proxies for the lending infrastructure, macroeconomic and credit supply conditions along with firm characteristics with definitions provided in Appendix 2. All independent variables are lagged one year, in line with Alves and Ferreira (2011) and Rajan and Zingales (1995) that lagged their explanatory variables one period to minimise endogeneity concerns.

The proxy for the information environment relates to the sharing of information, captured by the depth of credit information index (Credit Index). The legal environment 'consists of the commercial laws that specify the property rights associated with a commercial transaction' (Berger and Udell 2006, pp.297) whilst the judicial and bankruptcy environments define the enforceability of these laws amidst commercial and bankruptcy debacles. Hence, the strength of legal rights index (Legal Rights) serves as a proxy for the legal environment. The efficiency of the judicial system in resolving disputes is measured in terms of number of procedures (Number of procedures) needed for commercial resolution. As a robustness, we alternatively use the cost to enforce a contract (Cost to enforce). These measures are based on the work of Djankov et al. (2003). The efficiency of the bankruptcy environment is measured in terms of as "cents on the dollar recouped by creditors through reorganization, liquidation or debt enforcement proceedings" (Recovery rate). This measure is based on the work of Djankov et al. (2008). As a proxy for the social environment, we use a measure of trust (Social trust), derived from the European Social Survey (2012). Moreover, as a robustness check, we also use an index of trust derived by the World Values Survey (2018) (Social trust WVS). This measure has been employed by previous papers including Levine, Lin and Xie (2018). Guiso et al. (2011, pp. 440) purports 'fairness' and 'trustworthiness' are integral for economic transactions such that the belief that others are unfair or cannot be trusted will minimise their involvement in any such activities. Finally, as a proxy for the regulatory environment, we use two indexes: the bank regulatory capital to risk-weighted assets[2] (Regulatory index) and the percentage change of this index (Regulatory change).

[2] In particular, the index is measured as the ratio of total regulatory capital to its assets held, weighted according to risk of those assets.

Firm characteristics are included and derived from the SAFE survey. The recent literature has shown that young and small firms are more likely to be rationed by banks, as they are more opaque (see, e.g., Ferri and Murro, 2015). Hence, we include: firm age (Age, a dummy variable equal to one if the firm is more than 10 years old, zero otherwise), size (Size, a dummy variable equal to one if the number of employees is less than 50, zero otherwise). To control for the quality of borrowers, we use two indexes of firms' financial health and turnover. 'Increase debt ratio', a dummy variable equal to one if the firm declares in the last year an increase in the debt to assets ratio. 'Increase turnover', a dummy variable equal to one if the firm declares in the last year an increase in the turnover. Finally, we control for a set of industrial and geographical dummy variables (industry dummies and country dummies).

Two main macroeconomic variables are included: domestic demand and the inflation rate. Credit conditions are controlled using bank deposits to GDP. Finally, a financial institutional variable is included, that is the Herfindahl index, which serves as a proxy for bank competition. There is contrasting evidence of the impact of bank competition on credit availability. Known as the information hypothesis, stronger banking competition means banks are less able to internalise the benefit of helping opaque firms resulting in greater credit constraint (Petersen and Rajan, 1995). In contrast, more competition, known as the market power hypothesis, sees lower interest rates and greater credit availability (Carbo-Valverde et al., 2009). Chong et al. (2013) find lower bank concentration reduces financial constraints. Finally, to control for cyclical conditions at geographical levels, we add country dummies interacted with survey dummies (one for each wave of the SAFE).

4 Empirical Evidence

4.1 Baseline estimation

Table 2 provides the OLS and Probit estimation for the likelihood of rationing first without controls (columns 1-2), a Probit regression with industry dummies and country*wave dummies (columns 3-4) and finally the full model with the control variables (column 5). Initially, all of the lending infrastructure proxies are shown to influence the likelihood of firms being credit rationed and as hypothesised except for the bankruptcy environment. Having controlled for firm, industry and macroeconomic conditions however only three such proxies remain significant. Estimation results indicate that less efficient judicial systems (Number of procedures) increases the probability of firms being rationed. An increase of one standard deviation of Number of procedures increases the probability of rationing

by 4.4% (statistically significant at 10%, column 5). Hence, we find that firms in countries with less efficient judicial systems are more likely to be rationed. This effect is quite economically significant and lends support for Hypothesis 3. Stronger law enforcement lowers the risks of borrowers engaging opportunistically and enhances credit availability and concurs with Jappelli et al. (2005) and Moro et al. (2018). Surprisingly, more efficient bankruptcy systems (Recovery rate) results in a greater probability of credit constraint which contravenes Hypothesis 4. The estimated marginal effect, significant at 5%, is equal to 0.2%. Strong support for the social environment (Social trust) is shown also in column 5 as lower trust levels enhances the probability for firms being constrained. The marginal effect is quite significant, both statistically and economically with the marginal effect of 4.6% (statistically significant at 1%). Lending support for hypothesis 5 the assertion is higher levels of trust encourage trustworthy behaviour consistent with Nooteboom (2002) and that this benefits SMEs (Howorth and Moro, 2006).

We find also weak evidence of a negative impact on rationing of credit information, legal rights and regulatory capital level. Credit rationing is shown as more likely when there is less credit information sharing (Credit Index) between lenders and credit reporting service providers, supporting Hypothesis 1. The sharing of information enhances the due diligence process, making lending safer for borrowers (Bennardo et al., 2007; Moro et al., 2014, 2018) and reduces information asymmetries particularly for SMEs (Kallberg and Udell, 2003). Credit rationing is more likely when there is lower legal protection (Legal Rights). This supports hypothesis 2 and is consistent with the literature (see, e.g., Jappelli et al., 2005; Qian and Strahan, 2007; Deakin et al., 2010; Haselmann et al., 2010 and Moro et al., 2018) who find a positive relationship between creditor protection and credit access. Credit rationing is also more likely with less stringent bank capital regimes (Regulatory Index), supporting hypothesis 6a.

As for the control variables, estimation results suggest that firm age and firm size reduces the likelihood of rationing as expected for older and larger firms who are more likely to be better quality borrowers. The marginal effects are -0.061 and 0.077 respectively (both statistically significant at 1%). Firm growth and lower indebtedness also mitigates rationing (all the estimated marginal effects are statistically significant at 1%) as these may be classed as less risky. Finally, lower levels of bank competition (Bank concentration) increases the probability of credit rationing.

4.2 Robustness checks

Table 3 consists of a set of robustness checks. In particular, we consider three alternative measures of credit rationing (columns 1-3), two alternative measures of the lending infrastructure (columns 4-5) and an alternative strategy of clustering standard errors (by

survey wave and not by country, model 6). In columns 1- 3, we find that greater sharing of credit information (Credit index) increases the probability of all forms of rationing, in contrast with our hypothesis. Whilst these results refute hypothesis 1, they provide support for Brown et al. (2008) who assert that greater information sharing reduces lending depending on the quality of the borrower. Disclosure of 'black' or default information about a borrower can adversely impinge their credit rating, resulting in a greater likelihood of credit rationing (Padilla and Pagano, 2000). Better quality legal environments (Legal rights) prove significant only for weak rationing and unfavourable loan terms. The marginal effects are significant, -0.015 for weak and -0.022 for unfavourable loan terms, both statistically significant at 1%. Lending support for hypothesis 2, these results concur with Armour et al. (2009) 'quality of law hypothesis' and Haselmann et al., (2010) claim that greater protection rights afford lenders access to collateral in the event of default and a strong legal environment is especially important for SME lending. Just as depicted in Table 2 for total rationing more efficient judicial systems in terms of fewer procedures (Number of procedures) are shown as significant for weak rationing and unfavourable loan terms. The marginal effects are significant, 0.015 for weak and 0.014 for unfavourable loan terms, both statistically significant at 1%. This supports hypothesis 3 as stronger judicial law enforcement reduces the risk of borrowers engaging opportunistically. Equally, we concur with Arellano et al. (2007) assertion that weak enforcement negatively affects credit availability for small firms. Noticeably the efficiency of the bankruptcy regime (Recovery rate) is shown to matter only for strongly rationed firms and lends support for Hypothesis 4. The marginal effect is significant at -0.001 (significant at 1%). Higher recovery rates for creditors through foreclosure provides lenders with more power and reassurance (Succurro 2012, Gouvei et al., 2017) thereby enhancing credit availability. Strong support for the importance of the social environment, proxied by trust (Social trust) is shown for weak rationing and unfavourable loan terms. The marginal effects are significant (-0.041, significant at 1% level) for weak and (-0.022, significant at 5% level) for unfavourable loan terms. This concurs with the results in Table 2, column 5 for total rationing and with hypothesis 5. Stronger bank capital regulatory regimes (Regulatory index) see both weak rationing firms and firms with unfavourable loan terms more likely to be constrained, both marginal effects are statistically significant, 0.019 for weak and 0.016 for unfavourable loan terms. In contrast, stronger regimes mitigate constraint for strong rationing firms, as hypothesised, marginal effects, -0.012 (statistically significant at 10% level). Alternative measures of the lending infrastructure are presented in columns 4 (Social trust WVS) and in column 5 (Cost to enforce) for the social and judicial environment respectively. Similar results are shown as in Table 2. Our final robustness test involves clustering by wave (column 6) and the results are in line with the main results (reported in column 5 of Table 2).

4.3 Non-linear effects

Table 4 represents the results across a number of sub-samples based on firm and country characteristics.[3] Greater credit information is associated with a lower likelihood of credit rationing for larger and younger firms, in contrast to the period of sovereign debt crisis during which more information sharing sees more rationing. More legal rights matters for larger and older firms and during the sovereign debt period in lowering the probability of experience credit rationing in contrast to younger firms where such rights see more constraint. Efficient bankruptcy regimes matter more for younger firms and those in periphery countries in contrast to larger and older firms where greater efficiency leads to greater likelihood of rationing. Stronger judicial environments matter more for larger, younger firms and those in periphery countries. Higher trust levels matters in mitigating constraint for practically all sub-samples except those in core European countries where it increases the chance of rationing. Bank regulatory capital appears insignificant, regardless of firm size and firm age and is only significant when the financial conditions of a country are considered: the level of the capital regulatory index reduces the probability of credit rationing in the core European countries, while is detrimental for the credit availability of firms in periphery countries.

5 Conclusion

This paper analyses the influence of countries lending infrastructure on credit rationing for European SMEs. Based on a relatively large sample over the 2010 to 2014 period we find support for countries judicial, bankruptcy and social environments in influencing SME credit rationing which are robust to different measures of the lending infrastructure. As hypothesised more efficient judicial systems and higher trust levels in countries results in less rationing for SMEs. These findings are robust for weak rationed firms and those subject to unfavourable loan terms. The results for the bankruptcy environment however are unexpected as more efficient regimes implies greater rationing.

Our results have several policy implications. Firstly, the results surrounding the efficiency of the judicial environment highlights the significance of having fewer and less costly procedures in place for law enforcement in order to curtail SME credit rationing. Weaker enforcement regimes may have detrimental effects for SMEs, limiting their capacity to grow and even survive in some cases. Anything policy makers can do to address this weakness would be welcome. Secondly, the significant results pertaining to trust, our

[3] We consider as core European countries: Austria, Germany, Finland, France and Netherlands. While, we define Periphery countries: Belgium, Spain, Greece, Ireland, Italy and Portugal. Finally, we consider in the Sovereign debt crisis period the survey waves between April 2011 and September 2012 (waves 5-7).

proxy for the social environment illustrates how important interpersonal trust levels are for SME credit availability and the importance of this should not go unnoticed especially after a difficult decade across Europe.

Our study is confined to an analysis of the key components of Berger and Udell's (2006) lending infrastructure. It paves the way for future work to be conducted. In particular, further study of the information environment across different continents including Asia, Africa and South America would evaluate SME credit rationing across diverse institutional contexts. Moreover, a focus not only on the extent of credit information shared but the quality of shared credit information would provide a more holistic evaluation of the information environment and its implications for SME credit availability. Continued focus on the information environment is imperative given the growing role of private credit bureaus and public credit registries in economies today. We test the impact of competition/market power of financial institutions in our analysis and do not examine the impact of their ownership structure which could be the subject of further work. Equally, we do not factor in the role of lending technologies and as more information becomes available on the various technologies it would be useful to examine their impact on SME credit in a cross-country context. Finally, the impact of the lending infrastructure on discouraged borrowers, a category of borrowers not examined in this analysis are worthy of consideration. This we leave as a topic for future research.

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Table 1. Summary statistics

	All firms			Rationing			Weak Rationing			Strong Rationing		
	Obs.	**Mean**	**Std. Dev.**	**Rationed**	**No rationed**	***t*- test**	**Rationed**	**No rationed**	***t*- test**	**Rationed**	**No rationed**	***t*- test**
Dependent variables												
Rationing	13957	0.217	*0.412*									
Weak rationing	13957	0.310	*0.462*	1.000	0.118	*-285.475*						
Strong rationing	13957	0.113	*0.317*	0.522	0.000	*-57.499*	0.366	0.000	*-49.927*			
Unfavourable loan terms	13957	0.332	*0.471*	1.000	0.147	*-252.028*	1.000	0.032	*-536.599*	1.000	0.247	*-194.438*
Lending infrastuctures												
Credit index	13957	4.846	*0.622*	4.867	4.840	*-2.552*	4.882	4.830	*-5.147*	4.814	4.850	*2.673*
Legal rights	13957	5.230	*1.615*	5.002	5.293	*8.603*	5.000	5.333	*11.077*	5.046	5.254	*4.644*
Recovery rate	13957	67.508	*15.496*	66.147	67.886	*5.503*	66.409	68.002	*5.689*	65.637	67.748	*4.817*
Number of procedures	13957	32.939	*5.596*	34.242	32.578	*-13.821*	34.287	32.334	*-18.528*	33.468	32.871	*-3.659*
Cost to enforce	13957	19.614	*5.505*	20.311	19.421	*-7.588*	20.294	19.309	*-9.485*	20.205	19.539	*-4.421*
Social trust	13957	1.511	*0.436*	5.009	5.057	*3.824*	5.014	5.061	*4.268*	4.989	5.054	*3.803*
Trust (Word value survey)	13957	5.753	*0.591*	5.814	5.736	*-6.650*	5.815	5.725	*-8.532*	5.798	5.747	*-3.130*
Regulatory index	13957	13.702	*2.385*	13.054	13.881	*17.861*	13.091	13.975	*21.075*	13.147	13.773	*10.175*
Regulatory change	13957	0.046	*0.088*	0.044	0.047	*1.130*	0.043	0.047	*2.225*	0.049	0.046	*-1.110*
Control variables												
Age (over 10)	13476	0.822	*0.383*	0.779	0.834	*6.502*	0.795	0.834	*5.285*	0.732	0.833	*8.591*
Size (empl < 50)	13957	0.576	*0.494*	0.658	0.554	*-10.535*	0.616	0.559	*-6.445*	0.743	0.555	*-15.854*
Increase turnover	13919	0.403	*0.490*	0.307	0.429	*12.680*	0.315	0.442	*14.503*	0.273	0.419	*12.080*
Increase debt ratio	13887	0.349	*0.477*	0.412	0.331	*-8.047*	0.421	0.317	*-11.712*	0.386	0.344	*-3.178*
Domestic demand	13957	-0.712	*4.071*	-1.774	-0.417	*16.006*	-1.813	-0.218	*21.274*	-1.793	-0.574	*10.636*
Bank deposits	13957	83.150	*11.396*	86.528	82.213	*-18.219*	86.377	81.702	*-22.315*	86.870	82.674	*-13.420*
Bank concentration	13957	0.078	*0.068*	0.080	0.078	*-2.264*	0.080	0.078	*-1.672*	0.087	0.077	*-6.123*
Inflation rate	13563	0.271	*0.232*	0.290	0.266	*-4.835*	0.287	0.264	*-5.224*	0.284	0.269	*-2.141*

Note: This table reports summary statistics of the variables used in the empirical analysis. See Section 3.2 and Table A1. for more detail about measurement.

Table 2. Baseline Estimations

VARIABLES	(1) OLS Rationing	(2) Probit Rationing	(3) Probit Rationing	(4) Probit Rationing	(5) Probit Rationing
Credit index	-0.033*	-0.042**	-0.038**	-0.050***	-0.018
	(0.018)	(0.018)	(0.017)	(0.009)	(0.019)
Legal rights	-0.025***	-0.024***	-0.021***	0.001	0.002
	(0.007)	(0.006)	(0.006)	(0.004)	(0.003)
Recovery rate	0.003**	0.003**	0.003**	0.003***	0.002**
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Number of procedures	0.008*	0.006*	0.005	0.009***	0.008*
	(0.004)	(0.004)	(0.004)	(0.003)	(0.005)
Social trust	0.005	0.011	0.011	-0.039**	-0.046***
	(0.033)	(0.031)	(0.031)	(0.017)	(0.012)
Regulatory index	-0.020**	-0.022***	-0.022***	-0.005	-0.002
	(0.008)	(0.008)	(0.008)	(0.007)	(0.010)
Regulatory change	-0.106	-0.108	-0.114	0.059	-0.008
	(0.115)	(0.100)	(0.097)	(0.077)	(0.104)
Age (over 10 y.)					-0.061***
					(0.021)
Size (empl < 50)					0.077***
					(0.013)
Increase turnover					-0.031***
					(0.003)
Increase debt ratio					0.036***
					(0.006)
Domestic demand					-0.001
					(0.004)
Bank deposits					-0.001
					(0.001)
Bank concentration					0.383**
					(0.188)
Inflation					-0.000
					(0.018)
+ Industry dummies	N	N	Y	Y	Y
+ Time * Country dummies	N	N	N	Y	Y
Observations	13,957	13,957	13,957	13,957	12,996
Pseudo R-squared	0.053	0.058	0.071	0.098	0.106

Note: The table reports regressions coefficients (for OLS estimations) and marginal effects (for Probit estimations). The dependent variable and the estimation method are reported at the top of each column. When reported at the bottom of the table, the regressions include industry dummies and wave * country fixed effects. In parentheses are clustered (at country level) standard errors. ***; **, * denote significance at the 1%, 5% and 10% level, respectively.

Table 3. Robustness checks

	Alternative measures of rationing			Alternative measures of lending infrastructure		Clustering by wave
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Weak Rationing	Strong Rationing	Unfavourable loan terms	Rationing	Rationing	Rationing
Credit index	0.046***	0.048***	0.080***	-0.011	-0.028***	-0.013
	(0.007)	(0.014)	(0.017)	(0.019)	(0.011)	(0.009)
Legal rights	-0.015***	0.003	-0.022***	0.004	0.110***	0.002
	(0.002)	(0.002)	(0.003)	(0.003)	(0.018)	(0.002)
Recovery rate	-0.000	-0.001***	-0.000	0.002***	0.005***	0.002***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Number of procedures	0.015***	-0.004	0.014***	0.009*		0.008**
	(0.002)	(0.003)	(0.004)	(0.005)		(0.003)
Social trust	-0.041***	-0.013	-0.022**		-0.272***	-0.047***
	(0.005)	(0.008)	(0.011)		(0.032)	(0.014)
Regulatory index	0.019***	-0.012*	0.016*	-0.005	-0.014***	-0.001
	(0.004)	(0.007)	(0.009)	(0.009)	(0.003)	(0.010)
Regulatory change	0.031	-0.055	0.038	-0.052	-0.065	0.004
	(0.083)	(0.058)	(0.101)	(0.091)	(0.061)	(0.191)
Social trust (WVS)				-0.062***		
				(0.016)		
Cost to enforce					0.031***	
					(0.005)	
Age (over 10 y.)	-0.064*	-0.044***	-0.069*	-0.061***	-0.061***	-0.061***
	(0.035)	(0.010)	(0.041)	(0.022)	(0.022)	(0.018)
Size (empl < 50)	0.040	0.043***	0.053*	0.056***	0.057***	0.056***
	(0.028)	(0.006)	(0.027)	(0.015)	(0.015)	(0.011)
Increase turnover	-0.050***	-0.019***	-0.054***	-0.029***	-0.029***	-0.029***
	(0.004)	(0.002)	(0.006)	(0.004)	(0.004)	(0.011)
Increase debt ratio	0.073***	0.005	0.072***	0.036***	0.036***	0.036**
	(0.015)	(0.005)	(0.013)	(0.006)	(0.006)	(0.014)
Domestic demand	0.009***	-0.004*	0.010***	-0.000	-0.014***	-0.001
	(0.003)	(0.002)	(0.003)	(0.004)	(0.001)	(0.003)
Bank deposits	0.003***	0.000	0.004***	0.000	0.001**	-0.000
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Bank concentration	0.915***	0.420***	1.113***	0.565***	0.798***	0.407***
	(0.120)	(0.116)	(0.186)	(0.191)	(0.179)	(0.114)
Inflation	0.016	-0.033**	-0.030	0.012	0.156***	-0.001
	(0.019)	(0.015)	(0.019)	(0.017)	(0.026)	(0.027)
+ Industry dummies	Y	Y	Y	Y	Y	Y
+ Time * Country dummies	Y	Y	Y	Y	Y	Y
Observations	12,996	12,925	12,996	12,996	12,996	12,996
Pseudo R-squared	0.111	0.139	0.115	0.108	0.108	0.108

Note: The table reports marginal effects. The dependent variable is reported at the top of each column. The estimation method is Probit. All the regressions include industry dummies and wave * country fixed effects. In parentheses are clustered (at country level, wave level for column 6) standard errors. ***; **, * denote significance at the 1%, 5% and 10% level, respectively.

Table 4. Sub sample estimations

VARIABLES	(1) Rationing Micro & small	(2) Rationing Medium & large	(3) Rationing Age < 10	(4) Rationing Age > 10	(5) Rationing High risk	(6) Rationing Low risk	(9) Rationing Core	(10) Rationing Periphery	(11) Rationing Sov debt crisis	(12) Rationing No crisis
Credit index	0.018	-0.033*	-0.050**	0.031	0.015	-0.004	0.369***	0.201***	0.020*	-0.001
	(0.037)	(0.018)	(0.020)	(0.029)	(0.034)	(0.016)	(0.022)	(0.076)	(0.011)	(0.015)
Legal rights	0.007	-0.012***	0.058***	-0.022***	0.006	-0.005*	-0.217***	-0.016*	-0.036***	-0.008
	(0.009)	(0.002)	(0.003)	(0.007)	(0.007)	(0.003)	(0.020)	(0.010)	(0.003)	(0.005)
Recovery rate	0.001	0.002*	-0.005***	0.003***	0.001	0.002***	-0.006***	-0.002***	-0.000	0.001
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.000)	(0.001)	(0.000)	(0.001)	(0.002)
Number of procedures	0.000	0.011***	0.023***	0.004	0.006	0.003	-0.014**	0.012***	0.004**	-0.006*
	(0.008)	(0.004)	(0.005)	(0.007)	(0.010)	(0.002)	(0.006)	(0.004)	(0.002)	(0.004)
Social trust	-0.088***	-0.033***	-0.024*	-0.039**	-0.035*	-0.046***	0.149***	-0.145***	0.027***	0.062***
	(0.024)	(0.010)	(0.015)	(0.018)	(0.019)	(0.009)	(0.020)	(0.033)	(0.004)	(0.024)
Regulatory index	-0.011	0.010	-0.004	0.001	-0.003	-0.003	-0.056***	0.034***	-0.009**	-0.021*
	(0.012)	(0.011)	(0.013)	(0.012)	(0.019)	(0.005)	(0.009)	(0.010)	(0.004)	(0.012)
Regulatory change	-0.102	0.163	0.255*	0.012	0.010	-0.150***	-0.444***	0.022	-0.145**	-0.198*
	(0.107)	(0.109)	(0.142)	(0.114)	(0.269)	(0.051)	(0.091)	(0.089)	(0.063)	(0.115)
+ controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
+ Industry dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
+ Time * Country dummies	Y	Y	Y	Y	Y	Y	N	N	N	N
Observations	7,425	5,482	2,261	10,631	6,276	6,659	5,702	7,294	4,849	6,475
Pseudo R-squared	0.0745	0.109	0.134	0.109	0.0920	0.0975	0.0860	0.0414	0.111	0.0963

Note: The table reports marginal effects. The dependent variable is reported at the top of each column. The estimation method is Probit. Where reported, the regressions include industry dummies and wave * country fixed effects. Core countries are: Austria, Germany, Finland, France and Netherlands. Periphery countries are: Belgium, Spain, Greece, Ireland, Italy and Portugal. Sovereign debt crisis period is the period between April 2011 and September 2012. In parentheses are clustered (at country level, wave level for column 6) standard errors. ***; **, * denote significance at the 1%, 5% and 10% level, respectively.

Appendix

Appendix 1: Dependent variables

To construct our proxies for credit rationing we use the question 7(b) of the EC/ECB Survey on the Access to Finance of Enterprises (ECB, 2016) in which firms are asked:

Q7B. If you applied and tried to negotiate for this type of financing over the past 6 months, did you: receive all the financing you requested; receive only part of the financing you requested; refuse to proceed because of unacceptable costs or terms and conditions; or have you not received anything at all? [PROMPT IF NEEDED: Other external financing includes loans from other lenders, equity or debt issuance, leasing, factoring, etc., but excludes overdrafts, credit lines, bank loans and trade credit]

- Applied and got everything 1
- Applied and got most of it [BETWEEN 75% AND 99%] 5
- Applied but only got a limited part of it [BETWEEN 1% AND 74%].....6
- Applied but refused because cost too high 3
- Applied but was rejected 4
- [DK] 9
d) Bank overdraft, credit line or credit cards overdraft 1 3 4 5 6 9
a) ***Bank loan (new or renewal; excluding overdraft and credit lines) 1 3 4 5 6 9***
b) Trade credit 1 3 4 5 6 9
c) Other external financing..... 1 3 4 5 6 9'

(Source: ECB, 2016).

Table A1. Variable definitions and sources

Rationing	This variable relates to question 7 (b) part (a) reported in Appendix 1. Rationing is a dummy variable equal to one if the firm answers, "applied and only got a limited part of it [between 1% and 74%]", "applied but were rejected" or "applied but refused because the cost was too high", zero otherwise.	Source: *EC/ECB Survey on the Access to Finance of Enterprises.*
Weak Rationing	This variable relates to question 7 (b) part (a) reported in Appendix 1. Weak Rationing is a dummy variable equal to one if the firm answers, "applied and only got a limited part of it [between 1% and 74%]", zero otherwise.	Source: *EC/ECB Survey on the Access to Finance of Enterprises.*
Strong Rationing	This variable relates to question 7 (b) part (a) reported in Appendix 1. Strong Rationing is a dummy variable equal to one if the firm answers, "applied but were rejected", zero otherwise.	Source: *EC/ECB Survey on the Access to Finance of Enterprises.*
Unfavourable Loan Terms	This variable relates to question 7 (b) part (a) reported in Appendix 1. Unfavourable Loan Terms is a dummy variable equal to one if the firm answers, "applied and only got a limited part of it [between 1% and 74%]" or "applied but refused because the cost was too high", zero otherwise.	Source: *EC/ECB Survey on the Access to Finance of Enterprises.*
Credit Index	The depth of credit information index created by the World Bank measures 'rules and practices affecting the coverage, scope and accessibility of credit information available through either a public credit registry or a private credit bureau' (World Bank 2013d, pp.141). Higher values on this scale (0-6) imply greater availability of credit information (World Bank, 2013d).	Source*: Doing Business World Bank.*
Legal Rights	`The strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending' (World Bank 2013d, pp. 140).	Source: *Doing Business World Bank.*
Recovery Rate	'The recovery rate is recorded as cents on the dollar recouped by creditors through reorganization, liquidation or debt enforcement (foreclosure) proceedings' (World Bank 2013d, pp.151).	Source*: Doing Business World Bank.*
Number of procedures	'The procedures to enforce a contract [include] steps to file and serve the case, steps for trial and judgement [and] steps to enforce the judgement (World Bank 2013d, pp. 150).	Source*: Doing Business World Bank.*
Cost to Enforce	'The cost required to complete procedures (% of claim) [includes] average attorney fees, court costs [and] enforcement costs. Cost is recorded as a percentage of the claim, assumed to be equivalent to 200% of income per capita' (World Bank 2013d, pp.150).	Source*: Doing Business World Bank.*
Social Trust	This variable relates to the following question: '*Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Please tell me on a score of 0 to 10, where 0 means you can't be too careful and 10 means that most people can be trusted'* (European Social Survey, 2012)	Source: *European Social Survey.*
Social Trust (WVS)	This variable relates to the following question: 'Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?' (World Values Survey, 2018)	Source: *World Values Survey.*
Regulatory Index	The Bank regulatory capital to risk-weighted assets (%) is defined as 'the capital adequacy of deposit takers. It is a ratio of total regulatory capital to its assets held, weighted according to risk of those assets. (World Bank, 2017a).	Source: *Global Financial Development Database.*

Regulatory change	This variable measures the percentage change of the Regulatory index every year for each country. (World Bank, 2017a).	Source: *Global Financial Development Database.*
Age (over 10 years)	Firm age relates to question D5 of the *EC/ECB Survey on the Access to Finance of Enterprises* (ECB, 2016) in which SMEs were asked 'In which year was your firm registered?' (ECB, 2016). This is a dummy variable equal to one if the firms is older than 10 years, zero otherwise.	Source: *EC/ECB Survey on the Access to Finance of Enterprises.*
Size (employees < 50)	Firm size relates to question D1 of the *EC/ECB Survey on the Access to Finance of Enterprises* (ECB, 2016) in which SMEs were asked 'How many people does your company currently employ either full or part time in [YOUR COUNTRY] at all its locations?' (ECB, 2016). This variable is a dummy variable equal to one if the firm is a micro or small firm (from 1 to 49 employees), zero otherwise.	Source: *EC/ECB Survey on the Access to Finance of Enterprises.*
Increase turnover	This variable is a dummy variable equal to one if the firm answers "increased" to the question: "Please tell me whether turnover has decreased, remained unchanged or increased over the past 6 months in your company?" zero otherwise.	Source: *EC/ECB Survey on the Access to Finance of Enterprises.*
Increase debt ratio	This variable is a dummy variable equal to one if the firm answers "increased" to the question: "Please tell me whether debt ratio has decreased, remained unchanged or increased over the past 6 months in your company?" zero otherwise.	Source: *EC/ECB Survey on the Access to Finance of Enterprises.*
Domestic Demand	This is the 'growth of domestic demand component of GDP (at current prices)'.	Source: *Eurostat.* (See footnote 1).
Bank Deposits	Bank Deposits to GDP (Annual, not Seasonally Adjusted) is defined as 'the total value of demand, time and saving deposits at domestic deposit money banks as a share of GDP. Deposit money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits' (World Bank, 2017b)	Source: *Federal Reserve Economic Data, World Bank.*
Bank Concentration	The Herfindahl index (HI) for Credit institutions (CIs) total assets refers to the concentration of banking business. The HI is obtained by summing the squares of the market shares of all the credit institutions in the banking sector' (ECB, 2017).	Source: *Banking Structural Financial Indicators, ECB.*
Inflation	Inflation is the log difference of the Consumer Price Index (ECB, 2013c, Beck *et al.* 2008).	Source*: European Central Bank.*
Industry dummies	These variables relate to question D3 of the *EC/ECB Survey on the Access to Finance of Enterprises* (ECB, 2016) in which SMEs were asked 'What is the main activity of your company?' (ECB, 2016).	Source: *EC/ECB Survey on the Access to Finance of Enterprises.*