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# National culture of secrecy and firms' access to credit

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## Abstract

This study documents the impact of cultural differences, in terms of secrecy, on firms' access to credit. Cultures with a high degree of secrecy are characterized by a preference for confidentiality and non-disclosure of information. We employ World Bank Enterprise Surveys (WBES) data for a large sample of firms that operate in 44 countries over the period 2006-2019. We demonstrate that firms that operate in countries characterized by a higher degree of secrecy are less likely to apply for a credit while needing one – they are more discouraged – and are also less likely to obtain a credit when they apply – they are more rationed. We show the role played by information asymmetries in explaining this outcome. We control for various potential alternative drivers and conduct several robustness tests. Results confirm that cultures that promote transparency and disclosure of information achieve a better access to credit for firms.

**JEL Codes:** G32; G21; D82.

**Keywords:** Transparency; Information Disclosure; Banking; Discouragement; Rationing

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# **National culture of secrecy and firms' access to credit**

## **Abstract**

This study documents the impact of cultural differences, in terms of secrecy, on firms' access to credit. Cultures with a high degree of secrecy are characterized by a preference for confidentiality and non-disclosure of information. We employ World Bank Enterprise Surveys (WBES) data for a large sample of firms that operate in 44 countries over the period 2006-2019. We demonstrate that firms that operate in countries characterized by a higher degree of secrecy are less likely to apply for a credit while needing one – they are more discouraged – and are also less likely to obtain a credit when they apply – they are more rationed. We show the role played by information asymmetries in explaining this outcome. We control for various potential alternative drivers and conduct several robustness tests. Results confirm that cultures that promote transparency and disclosure of information achieve a better access to credit for firms.

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## 1. Introduction

Bank financing is a key source of funding for the economy and plays a major role for both firm growth and economic growth (Ullah and Wei, 2017; Levine et al, 2000). Its importance is especially acute for small and medium enterprises that have limited access to capital markets. However, information asymmetries on the credit market generate market imperfections which affect both firms' financing decisions (Lin et al., 2020) and banks' lending decisions (Agarwal and Hauswald, 2010). Adverse outcomes include turning down credit applications, rejecting part of firm's loan amount request, offering a menu of contracts, or discouraging borrowers from applying (Gama et al., 2017). In this context, dissemination of information plays a central role in firms' access to credit. While firms have incentives to provide more information to reduce asymmetries, information disclosure also entails costs for the firm (e.g., Verrecchia, 1983). So far, the literature explains the extent of information disclosure and the selective retention of information from a financial trade-off perspective (Suijs, 2007; Thakor, 2015). In this study, we show that different cultural tendencies to disclose or retain private information, referred to as cultural secretiveness, is a key driver of firms' access to credit.

The existence of different levels of corporate secretiveness across cultures have been put forward in the seminal work of Gray (1988). He stresses that in societies characterized by secrecy there will be *“a preference for confidentiality and the restriction of disclosure of information about the business only to those who are closely involved with its management and financing as opposed to a more transparent, open and publicly accountable approach”* (p. 8). In these countries, firms might decide to not disclose information and remain opaque for cultural reasons. This is likely to exacerbate information asymmetries and discourage lending compared with less secretive countries, resulting in a lower likelihood of securing credit. Within this context, we investigate whether and to what extent a national culture of secretiveness affects access to credit.

Our study is novel in that it examines the association between a culture of secrecy and access to credit. Within this context, we argue that the culture of secrecy serves as an umbrella of deep-rooted observable and unobservable characteristic that define various preferences towards disclosures, and in particular the willingness to provide hard, soft, and proprietary information when applying for credit and result in differences in access to credit across countries. This means that cultural secrecy frames preferences for opacity, renders more or less

salient information asymmetries and its associated adverse outcomes (e.g., moral hazard and adverse selection), which in turn impacts firms' access to credit.

In the empirical part of our work, we build on the conceptual framework of [Gray \(1988\)](#) and the empirical study of [Hope et al. \(2008\)](#) and construct an index of national culture of secrecy. This measure combines Hofstede's (1980) cultural dimensions in a distinct cultural trait that captures the cultural tendency to prefer secretiveness and the retention of information from others. We combine this with data from the World Bank Enterprise Surveys (WBES) for a large sample of firms that operate in 44 countries over the period 2006-2019. Then, we examine the impact of the culture of secrecy on the following two stages of financing: (i) whether the firm decides (or not) to apply for credit, and (ii) the decision by the bank to allocate credit (or decline it, or partially grant it). Our results show that there exists a positive and statistically significant association between the secrecy and the probability that a firm needs credit but decides not to apply. We also find a positive relationship between secrecy and the probability that a firm applied for credit but did not get accepted or did not obtain the full amount it requested.

In additional results, we show that the impact of cultural secrecy on firms' access to credit can be largely attributed to its effect on information asymmetries. Employing a Structural Equation Modelling (SEM), we show that most of the effect is mediated by firms' levels of opacity. The fact that the impact of cultural secretiveness is channelled by the degree of opacity suggests that it is notably through its effect on information asymmetries and negative outcomes such as adverse selection and moral hazard, that secretiveness hinders firms' access to credit. This clarifies the link between culture, information asymmetries, and firms' access to credit.

Because our study is based on cross-sectional survey-based data, we devote an important part of our work to endogeneity questions. Regarding the presence of omitted variables, we conduct robustness exercises in which we include additional subregional fixed-effects and computer [Oster's \(2019\)](#) test. On the causality front, we offer an instrumental variable approach. We leverage on a large literature in anthropology studies and instrument the national culture of secrecy with the historical proportion of cousin marriage. Cousin marriage and strength of kinship have been shown to exert an effect on in-group and out-group behavior (e.g., [Schultz et al. 2018](#)) that is likely to frame preferences for secrecy. Historical proportion ensures exogeneity of the instrument. A two-stage instrumental variable approach confirms the validity of the instrument as well as our main findings. Last, we take into account a potential selection bias by modelling the selection process leading a firm to acknowledge its need for credit. All

exercises confirm our main findings. Results are further robust to alternative measures of secrecy, credit risk, creditworthiness through current access to credit line, and quality of survey answers.

The rest of the manuscript is as follows. Section 2 provides a background discussion on access to credit and the role of cultural factors. Section 3 outlines the data and methodology. Section 4 discusses the results, and Section 5 concludes.

## 2. Background Discussion

### 2.1. Information Disclosure and Access to Credit

Lenders, such as banks, demand reliable information to assess the creditworthiness of prospective borrowers. By disclosing this information, firms increase their probability of acceptance and the amount of available credit (Moro et al., 2015). Early studies suggest that there are conditions (e.g., costless disclosures, credible disclosure of private information, homogenous interpretation of disclosures by firm's disclosures by investors, etc.) under which firms voluntarily disclose all their private information (Beyer et al., 2010).<sup>1</sup> In such an environment, firms would have no problem to provide all information. However, in practice, firms spend time to produce information to satisfy the requests of the banks, and the disclosures are not costless. Additionally, by sharing the firm's knowledge and know-how there is always a risk that the lender will accidentally disclose the information to competitors, suppliers or customers and compromise the future success of the firm (Moro et al., 2015).<sup>2</sup> Moreover, firm managers may withhold information under the fear that the loan managers may misinterpret or overreact to new information provided to them about the firm's performance or strategy with adverse effects for the firm's access to the credit (Moro et al., 2015). Therefore, firms' managers and owners typically have more information about the firm; however, they are not always willing to provide all the information to the bank, leading to information asymmetry between the two parties.

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<sup>1</sup> Beyer et al. (2010) refer for examples to early studies by Grossman and Hart (1980), Grossman (1981), Milgrom (1981), Milgrom and Roberts (1986).

<sup>2</sup> Thakor (2015) discusses that there is a larger literature that relaxes various of the conditions in the early studies, showing that partial disclosure may occur in equilibrium (e.g., Fishman and Hagerty, 2003; Hughes and Pae, 2004; Jung and Kwon, 1988, etc.). This strand of the literature introduces either exogenous costs (e.g., incapability of managers to communicate all dimensions of their private information, the existence of communication costs, etc.) or endogenous costs (i.e., proprietary) of disclosure.

The presence of information asymmetries is likely to affect the functioning of the whole credit market and generate both discouragement and credit rationing. Information asymmetries lead to two negative outcomes: adverse selection and moral hazard. Adverse selection occurs on a market when the lack of information leads to the eviction of good quality sellers with only poor-quality ones remaining – which might threaten the very existence of the market (Akerlof, 1970). Pagano and Jappelli (1993) have documented the existence of such a mechanism on the credit market, that might lead, in its dire form, to a credit crunch in periods of stress (Darmouni, 2020). Moral hazard occurs when information asymmetries entail an inability for a principal to perfectly observe the behavior of an agent (Stiglitz, 1983). This is usually the case in credit markets, where lenders cannot perfectly observe the behavior of borrowers (e.g., Sufi, 2007). This might lead to opportunistic behavior from borrowers, such as a lack of effort (Stoughton, 1993), strategic default (Guiso, Sapienza, and Zingales, 2013), and over-indebtedness (Maskin, 1999; Fernández de Guevara, Maudos, and Salvador, 2021). Adverse selection and moral hazard alter the good functioning of credit markets and might lead banks to charge higher interest rates, ask for excessive collateral, and ration credit. A national culture of secrecy is likely to exacerbate both these phenomena. A culture that favors the retention of information by the firm and provides room for unreported opportunistic behavior is likely to be associated with lower access to credit, due to its nurturing of moral hazard and adverse selection.

The literature on firms' access to credit has documented that the negative outcomes associated with information asymmetries play an important role in firms' access to credit - both in terms of application and rejection. This has been shown in theoretical (Jaffee and Russell, 1976; Stiglitz and Weiss, 1981; Chateau, 1983; Kon and Storey, 2003) and empirical studies. Some of the empirical studies focus on accounting disclosures of hard information and other focus on soft information. For example, Brown et al. (2009) show that information sharing between banks is associated with improved availability and lower cost of credit to firms in transition countries. Additionally, their results indicate that a firm with an external auditor and international accounting standards has a credit access indicator that is about 10% higher than the sample mean. Not surprisingly, they also find that opaque firms benefit more from information sharing. In a follow up study of European firms, Brown et al. (2011) find that financially opaque firms are less likely to apply for credit; however, they conclude that in countries with strong credit information sharing, financially opaque firms are less likely to be discouraged from applying for loans. Along the same lines, Balsmeier and Vanhaverbeke (2018) show that private firms that voluntarily use IFRS are associated with a higher propensity

to attract debt from foreign banks, although they do not finance similar evidence for domestic banks. [Chakravarty and Xiang \(2013\)](#) examine firms operating in ten developing countries to confirm that the ones with financial statements audited by external auditors have a lower likelihood of being discouraged. However, in a study of the Eastern European transition economies, [Drakos and Giannakopoulos \(2011\)](#) report that applying international accounting standards or using external auditors has an insignificant impact on credit rationing. [Cassar et al. \(2015\)](#) also report that the use of accrual accounting has no impact on the likelihood of loan denial. Others attempt to capture the role of soft information, information provided by third parties, and other information with the use of proxies like: whether firms operate in a large city ([Gama et al., 2017](#)), the use of third-party credit scores ([Cassar et al., 2015](#)), whether the firm holds an ISO certificate ([Ullah, 2020](#)), whether the bank offers a consultancy on strategic financial decision and whether it has a long-lasting relationship with the firm ([Ferri et al., 2019](#)), and the loan manager's satisfaction about the information that they receive in terms of quantity, quality, completeness, and timeliness ([Moro et al., 2015](#)).<sup>3</sup>

## 2.2. The Role Played by Cultural Factors

A common trend in the literature on firms' access to credit is that many cross-country studies conclude in favor of country-heterogeneity and cross-country differences ([Drakos and Giannakopoulos, 2017](#); [Ferrando and Mulier, 2015](#); [Kallandranis and Drakos, 2021](#)). While these studies consider country-level characteristics like macroeconomics ([Drakos and Giannakopoulos, 2017](#); [Gama et al., 2017](#)), regulatory quality ([Mac an Bhaird et al., 2016](#)), banking sector characteristics ([Mac an Bhaird et al., 2016](#)), the existence of information sharing systems ([Brown et al., 2009](#); [Brown et al., 2011](#)) and creditor rights ([Brown et al., 2009](#)) as drivers of the credit outcomes, they do not account for the potential impact of the culture of secrecy. Therefore, despite pointing out differences across countries in term of information asymmetries the firms are facing - which then explain different extents of discouragement and credit rationing, notably through mechanisms such as adverse selection and moral hazard - the literature assumes that all countries and firms are homogeneous in their will to temper these information asymmetries. In this paper, we argue the opposite: this drive is unlikely to be as systematic as the literature suggests. This is because firms may wish to remain opaque, not for financial but for cultural reasons.

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<sup>3</sup> [Moro et al. \(2015\)](#) examine the amount of short-term credit that was provided by the bank rather than discouraged borrowers or whether the loan was approved or rejected. Similarly, [Ullah \(2020\)](#) examines the access to finance from various sources while comparing certified and uncertified firms.



Culture can be defined in various ways, as notably discussed in [Alesina and Giuliano \(2015\)](#). For example, [Hofstede et al. \(2010\)](#) define it as the collective programming of the mind that distinguishes the members of one group or category of people from others. Alternatively, [Guiso et al. \(2006\)](#) refer to culture as “*those customary beliefs and values that ethnic, religions, and social groups transmit fairly unchanged from generation to generation*” (p.23). Regardless of the exact definition, there is an agreement in the literature that culture has an impact on expectations, preferences, and economic behaviour ([Guiso et al., 2006](#); [Beugelsdijk and Maseland, 2011](#)), with implications for managerial and entrepreneurial characteristics, decisions, and practices ([Hayton et al., 2002](#); [Newman and Nollen, 1996](#); [Kreiser et al., 2010](#); [Hofstede et al., 2010](#)). Closer to our context, several studies have pointed to the role of culture on financial decisions, like syndicated loans ([Giannetti and Yafeh, 2012](#)), cost of debt ([Chui et al., 2016](#)), and debt maturity ([Zheng et al., 2012](#)). On debt financing, [Giannetti and Yafeh \(2012\)](#) show how cultural distance impacts access to the syndicated loan market. [Chui et al. \(2016\)](#) employ [Schwartz’s \(1994\)](#) embeddedness and mastery cultural dimensions and document their impact on the cost of debt. [Zheng et al. \(2012\)](#) employ [Hofstede’s \(1980\)](#) four cultural dimensions and provide further evidence on the impact of culture on debt maturity choices. Beyond debt structure, [Shao, Kwok, and Guedhami \(2010\)](#) show the role of [Schwartz’s](#) cultural dimensions on dividend policies, and [Boubakri et al. \(2016\)](#) illuminate the role between preferences to collectivism and public ownership.

Our approach also leverages on cultural differences to explain outcomes on the credit market. However, compared with previous studies, it relies on the concept of secretiveness. Secretiveness can be defined as the inclination of a society towards secrecy and the retention of information from others. This is likely to be an important cultural factor for firms’ access to credit due to its impact on information asymmetries. Firms that evolve in countries with high secretiveness are likely to be more adversely impacted by the negative outcomes of information asymmetries (e.g., moral hazard and adverse selection). In turn, this is likely to reduce their access to credit. [Gray \(1988\)](#) proposes a conceptual framework that relates the inclination of a society towards secrecy with the disclosures of corporations. In general, despite being based on the combination of [Hofstede’s \(1980\)](#) cultural dimensions, secrecy is perceived as a distinct cultural trait, with empirical work in the field providing support to the arguments of [Gray \(1988\)](#) in various contexts.

First, a large strand of the literature documents an impact of the national culture of secrecy on accounting practices. [Salter and Niswander \(1995\)](#) use data from 29 countries to conclude that [Gray's](#) model has statistically significant explanatory power, especially in the case

of financial reporting practices. [Gray and Vint \(1995\)](#) and [Zarzeski \(1996\)](#) provide further support to this, while [Hooi \(2007\)](#) reaches a similar conclusion while focusing on the banking industry. Additionally, the literature documents a relationship between the culture of secrecy and earnings management ([Braun and Rodriguez, 2008](#)), the decision to hire Big 4 auditor ([Hope et al., 2008](#)), and the auditing outcome ([Chen et al., 2017](#)).

Second, a stream of the literature shows that the effect of the national culture of secrecy extend to various types of disclosure practices, beyond financial statements. For example, [Williams \(1999\)](#) finds that cultural dimensions are significant determinants of the quantity of voluntary environmental and social disclosures supplied by listed companies in seven Asia-pacific countries. Along the same lines, [Lu and Wang \(2021\)](#) find that various dimensions of culture influence the disclosure of corporate social responsibility information. Using a sample of firms from 33 countries, [Luo and Tang \(2016\)](#) show that the cultural dimensions of masculinity, power distance and uncertainty avoidance are strongly and consistently related to carbon disclosure propensity. Finally, [Gottsche et al. \(2020\)](#) find an association between a culture of secrecy and discretionary disclosures that relate to segmental reporting. In more detail, using a sample of European firms they conclude that despite incentives to reveal private information, managers' culturally determined preferences for secrecy lead them to provide a low quantity as well as a lower quality of disclosures within segmental reports.

Third, a strand of the literature focuses on the role of the national culture of secrecy in banking and finance. Among them, [Makrychoriti and Pasiouras \(2021\)](#) show that the culture of secrecy plays a role even in the case of bureaucratic organizations like central banks, influencing their monetary policy transparency. Additionally, [Pasiouras et al. \(2021\)](#) find that the culture of secrecy influences the decision of firms as for the number of bank-firm relationships that they established. Their results point to a positive association, and as they mention: "*firms may strategically establish many bank relationships that will provide sufficient financing, but they will not come with the costs of over-monitoring and requests for enhanced disclosures of soft information*" (p. 224). Hence, the issue of corporate information disclosures to the bank has a central role in their analysis as well.

However, to the best of our knowledge, no study has examined the association between a culture of secrecy and access to credit. As discussed earlier the literature suggests that the disclosure of information has both benefits and costs. [Moro et al. \(2015\)](#) mention for example that the costs include the time to spend producing information to satisfy the banks' requests. Therefore, firms only reveal private information if the benefits exceed the disclosure-related costs. However, [Gottsche et al. \(2020\)](#) demonstrate that this cost-benefit analysis is affected by

culturally driven preferences of the managers.<sup>4</sup> Consequently, even if there are anticipated benefits for disclosing information to outsiders, managers' cultural preferences might conflict with such incentives (Gottsche et al., 2020). As the same authors discuss, the preferences of the managers can lead to nonlinearity of the utility function, assigning a higher weight to the costs rather than the benefits. In our context, this means that managers may assign a higher weight to the costs of the disclosures compared to the benefits of obtaining finance, and hence they may decide not to apply for credit. Alternatively, they may withhold information during the application phase, an action that could eventually result in the decline or partial acceptance of their application as the bank will not have access to all the necessary information. Both these effects result from the potential adverse selection and moral hazard generated by higher information asymmetries within a culture that promotes secretiveness. This leads to the following two hypothesis:

*H1: Firms operating in a country with high cultural secrecy will have a lower probability to apply for loan despite their financing needs*

*H2: Firms operating in a country with high cultural secrecy will have a lower probability to have their loan application approved or to obtain the full amount requested*

### **3. Empirical Setting**

#### **3.1. The Enterprise Survey Dataset**

In this paper, we use the Enterprise Surveys (ES) data from the World Bank. This survey has been conducted since the 1990s and is composed of firm-level data on the business environment from business owners and top managers. We focus on the surveys occurring over the 2006-2019 period in 44 countries, for a sample size of 22,123 firms.<sup>5</sup> While there is a time-dimension in the data, these are longitudinal (not panel) data, with different companies

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<sup>4</sup> Although in a difference context, Schneider and De Meyer (1991) also mention the following while discussing the study of Sullivan and Nonaka (1988) that compares Japanese and American managers “One could argue that Japanese managers would more likely interpret a strategic issue as a ‘threat’ and restrict information sharing as they prefer to avoid uncertainty (Hofstede, 1980) and perceive less control over their environments (Maruyama, 1984; Kagono et al., 1985)” (p. 310).

<sup>5</sup>We focus on the post-2006 period because data collection efforts were centralized within the Enterprise Analysis Unit, where a Global Methodology was developed and applied ever since. The creators of the WBES note that data users should exercise caution when comparing raw data and point estimates between surveys that did and did not adhere to the Enterprise Surveys Global Methodology. Therefore, we decided to focus on the period with the more recent data that were collected with the Global Methodology. The list of the countries is displayed in table 1.

interviewed at every wave. This survey is well used in recent academic papers (Dutta and Mallick, 2023).

Enterprise Survey data provides a precise way to measure if a company needed, applied, and obtained a credit. We are interested in these different phases, and especially on: (i) companies that needed credit but decided not to apply (discouraged companies), and (ii) companies that applied for credit but were rationed – i.e., their application was either fully or partially rejected. Information on these two elements is obtained from the questions K16, K17 and K20 of the Finance section of the survey.

Question K.16, reproduced below, reveals whether the firm applied for credit over the last fiscal year or not. Percentages in parenthesis indicate the proportion of answers for each item.

*K.16 - Referring again to the last fiscal year [Insert last complete fiscal year], did this establishment apply for any lines of credit or loans?*

- Yes (22.65%)
- No (74.50%)
- Don't Know (spontaneous) (2.85%)

### 3.1.1. Measuring discouragement

In line with the literature, we define discouraged borrowers as creditworthy firms that did not apply for a loan while they needed a credit (Kon and Storey, 2003; Cowling and Scip, 2022). Firms that did not apply for a credit are firms that answer “No” to K16. Question K.17, informs on the reasons a firm did not apply for a loan:

*K.17 – What was the main reason why this establishment did not apply for any line of credit or loan?*

- No need for a loan - establishment had sufficient capital (61.45%)
- Application procedures were complex (7.40%)
- Interest rates were not favorable (13.82%)
- Collateral requirements were too high (6.53%)
- Size of loan and maturity were insufficient (2.15%)
- Did not think it would be approved (2.67%)
- Other (6.68%)
- Don't know (spontaneous) (0.45%)

We construct the dummy variable *Discouraged*, as follows. We classify a firm as discouraged (*Discouraged* = 1) if it needed credit, but did not apply either because: (i) applications procedures were too complex; (ii) interest rates were too high; (iii) collateral requirements were too high; and (iv) rationing was anticipated (*Size of loan and maturity were insufficient, or Did not think it would be approved*). Firms that did apply for a loan (“Yes” to K16) are classified as non-discouraged (*Discouraged* = 0). Companies that answer *No Need for a Loan* or *Don’t Know* to K17 are not considered as discouraged and are not part of the main set of data. This classification closely mimics the one adopted by [Chakravarty and Xiang \(2013\)](#) or [Dutta and Mallick \(2023\)](#), with Enterprise Survey data. It is consistent with the definition of a discouraged borrower adopted by [Chakravarty and Yilmazer \(2009\)](#) and [Han et al. \(2009\)](#).<sup>6</sup> We also include the “Other” category, following the more recent approaches of [Rostamkalaei et al. \(2020\)](#) and [Mol-Gómez-Vázquez et al. \(2020\)](#) and the qualitative evidence of [Naegels et al. \(2021\)](#), who show through interviews that discouragement stems from a variety of other reasons that are not necessarily captured by constrained answers.

Finally, a stricter theoretical definition of discouragement requires firms that do not apply for a credit while needing one to be *creditworthy* ([Kon and Storey, 2003](#)). Previous empirical literature assumed the creditworthiness of firms that did not apply for a credit out of the fear to be turned down, or out of the conviction to be rationed (e.g., [Chakravarty and Yilmazer \(2009\)](#); [Han et al., 2009](#); [Chakravarty and Xiang, 2013](#)). While we follow this approach in our main analysis, we perform a robustness analysis in which we discuss this assumption, previous methodologies, and conduct a test that controls for creditworthiness of discouraged borrowers through current access to credit lines.

### 3.1.2. *Measuring rationing*

In line with the literature on rationing (e.g., [Jaffee and Russell, 1976](#); [Jaffee and Stiglitz, 1989](#); [Levenson and Willard, 2000](#); [Brown et al., 2011](#)) we define rationed firms as firms that

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<sup>6</sup> [Chakravarty and Xiang \(2013\)](#) also include firms that did not apply due to “corruption in allocation” (p. 67). This information is not consistently available across countries and over the different waves of our larger sample. [Chakravarty and Yilmazer \(2009, p.790\)](#) define discouraged borrowers as firms that did not apply to credit over the past three years “because [they] thought the application would be turned down”. [Han et al. \(2009\)](#) classify a firm as discouraged if it did not apply for credit over the last three years “because of fear of rejection” (p. 416).

applied for credit but did not obtain it *either partially or fully*. This means our measure of rationing include both partially and fully rationed firms.

From companies that applied for a loan (Yes to K.16), we obtain information as for the outcome of the application from the answer to Question K.20:

*K.20 - Referring only to this most recent application for a line of credit or loan, what was the outcome of that application?*

- *Application was approved in full (82.48%)*
- *Application was approved in part (6.59%)*
- *Application was rejected (4.92%)*
- *Application was withdrawn (1.34%)*
- *Application still in process (3.30%)*
- *Don't Know (spontaneous) (1.36%)*

We construct the dummy variable *Rationed*, as follows. Firms that answer “*Application was approved in full*” are classified as not rationed (*Rationed* = 0). Firms that answer either “*in part*” or “*rejected*” are classified as rationed (*Rationed* = 1). Finally, withdrawn applications, applications still in process and “*Don't know*” are not considered in the analysis.<sup>7</sup>

In total, out of the 28,601 firms in the original Enterprise Survey Dataset, 22.65% (6,478) applied for a credit and 77.35% (22,123) did not apply for credit. Among firms that did not apply for credit, 38.55% (8,529) are classified as discouraged, while 61.45% (13,594) did not need credit. Among firms that did apply for credit, 82.48% (5,343) obtained credit in full, while 11.51% (746) were rationed.

### **3.2. Measuring Secrecy**

Our measure of secrecy (*Secrecy*) follows the earlier empirical literature and is based on the seminal work of Gray (1988). In his conceptual model, he proposed that secrecy is closely associated to the following three dimensions of national culture by Hofstede (1980): uncertainty avoidance, power distance, and individualism. First, Gray (1988) argues in favor of a positive association between a culture of uncertainty avoidance in the society and a culture of secrecy.

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<sup>7</sup> A sizeable part of the firms that applied for credit (Yes to K.16) did not answer to the K.20 question, leading to a reduction in sample size.

The underlying idea is that in countries characterized by a culture of high uncertainty avoidance there is a tendency to restrict information disclosures in order to avoid conflict and competition and to preserve security. Second, he asserts that there is positive association between a culture of high power-distance and secrecy. This is because high power-distance societies are likely to favor the restriction of information to preserve power inequalities. Third, he suggests that there is a negative relationship between a culture of individualism and secrecy. This is because secrecy is consistent with a preference for collectivism, as opposed to individualism, with its concern for those closely involved with the organization rather than external parties.

Based on this conceptual framework, Hope et al. (2008) propose the estimation of a country-level indicator of a national culture of secrecy, that can be defined as: National Culture of Secrecy = UAI + PDI – INDIV, where UAI, PDI and INDIV are the scores from the individual dimensions of uncertainty avoidance, power distance, and individualism, respectively. We follow this approach to calculate the indicator of secrecy used in our study, that is consistent with earlier work by Chen et al. (2017), Mazboudi and Hasan (2018), Kanagaretnam et al. (2019), Gottsche et al. (2020), Pasiouras et al. (2021), Makrychoriti and Pasiouras (2021). In our sample, UAI and PDI take values from 13 to 100, and INDIV takes values from 6 to 80. *Secrecy* takes values from 19 to 188, with a median at 113, a mean at 120, and a standard-deviation of 30.45.<sup>8</sup> *Secrecy* essentially ranks culture in term of secretiveness. The higher the value of *Secrecy*, the more the national culture favors secretiveness.

Table 1 provides an overview of the variables by displaying for each country in the study the value of *Secrecy*, along with the percentage of firms that were discouraged (*Discouraged*), applied for credit, and either obtained it in full or were rationed (*Rationed*).

[Insert Table 1 Around Here]

### 3.3. Model

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<sup>8</sup> Data for the cultural indicators are from Hofstede Insights, a data source frequently used in past studies. Hofstede Insights includes information not only on the original set of countries by Hofstede (1980) but also estimated scores that were added through research projects of other researchers or internal projects of Hofstede Insights. In theory each one of the individual components (UAI, PDI, INDIV) may take values between 0 and 100. Therefore, in theory, *Secrecy* may take values between -100 (i.e., assuming UAI and PDI are both equal to 0 and INDIV is equal to 100 for a given country) and 200 (i.e., assuming UAI and PDI are both equal to 100 and INDIV is equal to 0 for a given country).

To test our hypothesis that the national environment of secrecy impacts the probability to be discouraged, we use the following probit model:

$$\Pr(\text{Discouraged} = 1 | \text{Secrecy}, \mathbf{Controls}) = \Phi(\beta \times \text{Secrecy} + \mathbf{Control}^T \boldsymbol{\gamma})$$

*Discouraged* is measured at the firm-level while *Secrecy* is measured at the country-level. **Controls** is composed of a vector of control variables from the previous literature on the determinants of access to credit. It includes firm-level variables that control for managerial characteristics (experience, gender) and firm characteristics (size, age, ownership structure, use of R&D, legal status, quality certificate). Moreover, we include two variables that relate to financing and auditing. The first, *Obstacle*, is a dummy variable that equals one if the firm considers that it has difficulties to have access to credit. Thus, it reflects the firm's own perceptions on this matter. The second, *F.S. Certified*, is a dummy that takes the value of one if the firm has certified financial statement and the value of zero otherwise. We also control for the following country-level characteristics: strength of auditing and financial reporting standards, lending-related legal rights and credit information availability, legal efficiency, inflation, and financial development. Finally, we control for sector and year-specific effects with the use of dummy variables.  $\Phi$  is the Cumulative Distribution Function (CDF) of the standard normal distribution. The Appendix provides the list and definitions of the variables employed in the study.

Next, we investigate the impact of secrecy on the likelihood to be rationed. The model is similar to the one presented above:

$$\Pr(\text{Rationed} = 1 | \text{Secrecy}, \mathbf{Controls}) = \Phi(\beta \times \text{Secrecy} + \mathbf{Control}^T \boldsymbol{\gamma})$$

*Rationed* is measured at the firm-level. We employ the same set of control variables.

Table 2 provides the descriptive statistics of the variables employed in the analysis. We provide the mean-difference t-statistic between firms that applied and firms that were discouraged, as well as between firms that were rationed and firms that fully obtained their credit. In general, these two groups present significant differences, supporting the use of these variables as controls in the models.

[Insert Table 2 Around Here]

#### 4. Secrecy and access to credit



#### 4.1. Main results

We first focus on the impact of the national culture of secrecy on the probability for a firm to be discouraged. The first column of Table 3 reports the results. The coefficient of *Secrecy* is positive and significant. It suggests that firms that operate in countries characterized by a higher degree of secrecy are less likely to apply for a credit while needing one. This finding provides support to our working hypothesis that a culture of secrecy will amplify information asymmetries with implications for access to credit. It appears that firms may prefer not to apply for credit in the first place, possibly assigning more value to the preservation of their secrecy and the non-disclosure of information to the lenders than the approval of their application. The adverse impact of less information disclosure on firms' access to credit is in line with the discouragement model of [Kon and Storey \(2003\)](#). In their approach, a higher cost of information disclosure leads to more discouragement from the firms. Our study reveals that this situation can notably be attributed to differences in cultural attitudes towards secrecy.

In terms of economic significance, for every unit increase of the culture of secrecy the odds of being discouraged (versus being non-discouraged) are 1.001 times higher, given that other variables in the model are held constant.<sup>9</sup> To put that into perspective, the odds of being discouraged for a firm operating in a country with the average national secrecy in our sample, like Croatia (secrecy = 120) are 31.03 times higher than those of a firm operating in a country that is approximately one standard deviation lower in our sample, like Argentina (secrecy = 89). This result considers macroeconomic differences across countries and microeconomic differences across firms.

Second, we focus on the national culture of secrecy on credit rationing. Results are reported in the second column of Table 3. It appears that firms that operate in a country characterized by a higher culture of secrecy are more rationed. Accordingly, the information asymmetries that are associated with a culture of secrecy seem to result in a higher probability of rationing. The most likely explanation for this is that the culture of secrecy results in fewer disclosures of both financial and non-financial information ([Gray and Vint, 1995](#); [Gottsche et al., 2020](#)), while it may also raise concerns about audit quality ([Hope et al., 2008](#); [Chen et al., 2017](#)) and earnings management ([Braun and Rodriguez, 2008](#)). Therefore, lenders operating in countries with a higher culture of secrecy are more cautious as they may not have all the necessary creditable

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<sup>9</sup> Based in the logit regression coefficient, increasing the culture of secrecy by 1 unit will result in a 0.001 increase in  $\log(p)$  or  $\log(p/1-p)$ . Now, if  $\log(p/1-p)$  increases by 0.001, that means that  $p/(1-p)$  will increase by  $\exp(0.001) = 1.001$ . This is a 0.10% increase in the odds of being discouraged (assuming that the other variables remain fixed).

information that they need to form an opinion about the creditworthiness of the prospective borrowers. This results in a higher probability of either rejected applications or approvals that meet only partially the requests concerning the amount of credit. In terms of economic significance, for every unit increase the culture of secrecy the odds of being rationed are 1.004 times higher, given that other variables in the model are held constant.<sup>10</sup> Referring again to the case of Croatia and Argentina, the odds of a Croatian firm being rationed are 31.12 times higher than those of an Argentinian firm.<sup>11</sup>

Of particular importance is that the results hold when we account for other sources of information at the country-level like the strength of auditing and financial reporting and the coverage, scope and accessibility of credit information available through credit reporting services (i.e., part of the lending-related legal rights and credit information availability indicator). In general, it seems that except for the dummy for the CEO's gender that does not influence either the probability of discouragement or the one of rationing, the findings for the control variables are consistent with expectations. In more detail, the remaining firm-specific and country-specific control variables appear to influence at least one and, in several cases, both outcomes. As it concerns attributes that could influence the dissemination of information, we find that lower quality certification, lower perceptions about the strength of auditing and financial reporting systems, higher lending-related legal rights and credit information availability, lower legal efficiency, and higher financial development result in a higher probability of both being discouraged and rationed. The rest of the variables influence either one of the two outcomes or the direction of their impact differs between the two outcomes.

[Insert Table 3 Around Here]

## 4.2. The Opacity Channel

Our results show that firms that evolve in a culture that values secrecy have a lower access to credit, either through self-discouragement or through credit rationing. We explained this result by the negative effect additional information asymmetries exert on firms' access to credit – which has been largely documented in the banking and finance literature (e.g., Pagano and

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<sup>10</sup> Based in the logit regression coefficient, increasing the culture of secrecy by 1 unit will result in a 0.004 increase in  $\text{logit}(p)$  or  $\text{log}(p/1-p)$ . Now, if  $\text{log}(p/1-p)$  increases by 0.004, that means that  $p/(1 - p)$  will increase by  $\exp(0.004) = 1.004$ . This is a 0.40% increase in the odds of being rationed (assuming that the other variables remain fixed).

<sup>11</sup> This is the difference between the secrecy values of the two countries (i.e., 120 – 89) multiplied by 1.004.

Jappelli, 1993; Darmouni, 2020). Our narrative argues that the national culture of secrecy affects firms' opacity and disclosure levels, which in turn affect their access to credit. We now reinforce this perspective. We employ the cross-section of firms and countries in our sample to isolate firms for which information asymmetries are lessened. We then estimate to which extent opacity mediates the effect of the national culture of secrecy.

We propose two measures of firm's opacity at the firm level. We identify *less* opaque firms as: (i) firms that have their books externally audited (e.g. Drakos and Giannakopoulos, 2011) and (ii) firms that possess an international public accreditation (such as ISOs or HAAS). We use the dummy variables *F.S. Certified* and *Quality Certification*, as defined earlier in our analysis. To test the mediating effect of opacity levels on firms' access to credit, we propose a Structural Equation Modelling (SEM) and compute the associated mediating effects. Mediation analysis "considers an intermediate variable, called the mediator, that helps explain how or why an independent variable influences an outcome [...] It is often of great interest to identify and study the mechanisms by which an intervention achieves its effect." (Gunzler et al., 2013, p.390). It allows the decomposition of the total effect of one variable on another into a direct and indirect effect (Bollen, 1987) and has been widely adopted in social sciences, and more recently in economics (see for instance Blundell, 2017).

In our case, we propose to mediate the effect *Secrecy* exerts on either *Discouragement* and *Rationed* with these two mediators (i.e. *F.S. Certified* and *Quality Certification*). We set different paths in each case and compute the direct, indirect, and total effect. Results are reported in Table 4.

[Insert Table 4 Around Here]

Focusing first on the total effect confirms that a higher cultural secrecy significantly increases the likelihood for firms to get discouraged or rationed. Decomposing this effect between the indirect effect and the direct effect reveals that most of it is transmitted through the mediator. Around two-thirds of the effect the national culture of secrecy exerts on discouragement is mediated by firm's level opacity. This figure reaches 93% when explaining firms' rationing. In short, firm's opacity mediates the effect of the national culture of secrecy. This aligns with our narrative and suggests that the adverse effects of cultural secrecy on access to the credit market is channelled by firms' levels of opacity. This result illuminates the link between cultural secrecy, information asymmetries and access to credit, both preventing firms that need a loan from applying, and rationing the ones that decide to apply.

### 4.3. Robustness Tests

#### 4.3.1. Accounting for credit risk

The business environment, and in particular credit risk in the market, may play a central role in the decision of the lenders, as well as the perceptions of the borrower as for the outcome of their credit application. The WBES do not provide a firm-level measure of risk. Furthermore, given that the information provided in the WBES database is anonymous, it is not possible to match the firms with external information and calculate or attach to them firm-specific risk measures from other sources. Therefore, we resort on aggregate industry-specific information to capture the overall credit risk conditions for each sector in each country at a given point in time.

Our first measure of risk is the aggregate sector-specific probability of default (PoD) from the Credit Research Initiative (CRI) of the National University of Singapore.<sup>12</sup> Our second measure is the actuarial spread from the same source.<sup>13</sup> In both cases, we resort on the one-year ahead (i.e., 12 months) estimations.<sup>14</sup> Based on information about the activity and industry of each firm in the WBES we assign the most closely related sectoral-level aggregate estimates from the CRI, for the corresponding point in time.

We then re-estimate the specifications of Table 3 with the inclusion of these two measures of credit risk. We present the results in Table 5. The PoD and the actuarial spread in columns (1) and (3), respectively, are based on the average of the 12 monthly estimations in each year. In columns (2) and (4), we use the December CRI estimations from the year preceding the WBES survey.<sup>15</sup> Contrary to our expectations, these indicators do not influence the probability of being discouraged or rationed. Our main results hold.

[Insert Table 5 Around Here]

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<sup>12</sup> The PoD estimations of the CRI are based on the forward intensity model developed by [Duan et al. \(2012\)](#). The CRI computes PD on an individual firm-level basis; however, it also aggregates the CRI PD of all firms with a specific region and/or sector to deliver an overview of the credit environment at a certain point in time ([Credit Research Initiative, 2019](#)).

<sup>13</sup> This measure reflects the credit risk of corporations by summarizing the information embedded in the term structure of the physical probability of default and the discount rate ([Credit Research Initiative, 2018](#)), and it is equivalent to pricing CDS purely based on their actuarial values ([Duan, 2014](#)).

<sup>14</sup> Using different forecasting horizons does not influence our main results.

<sup>15</sup> For example, in columns (1) and (3) we match the WBES data for 2018 with the average of the twelve one-year ahead CRI PoD and actuarial spread estimations from each month from January 2018 to December 2018. In columns (2) and (4), we match the WBES data for 2018 with the CRI one-year ahead estimations from December 2017.

#### 4.3.2. *Alternative Indicator of Secrecy*

The conceptual framework of Gray (1988) suggests that masculinity may also have a link with secrecy.. The underlying idea is that feminist societies that emphasize more the quality of life, people, and the environment will tend to be more open especially with regards to socially related information. As in Hope et al. (2008) and Pasiouras et al. (2021) we perform a robustness test with the use of an alternative measure of secrecy (Secrecy2) that is calculated as  $\text{Secrecy2} = \text{UAI} + \text{PDI} - \text{INDIV} - \text{MASC}$ , where MASC refers to the score of masculinity. We present these estimations in Columns (1) and (2) of Table 6. The results are consistent with the ones presented in Table 3.

[Insert Table 6 Around Here]

#### 4.3.3. *Restricting the sample to respondents with an existing line of credit*

Kon and Storey (2003) model discouragement as firms that do not apply, despite being creditworthy and in need of credit. Empirically, creditworthiness has always been assumed in the discouragement literature, due to the difficulty of assessing it without a credit application (Chakravarty and Yilmazer, 2009; Han et al., 2009; Chakravarty and Xiang, 2013; Mac an Bhaird et al., 2016). In our study, to ensure creditworthiness, we adopt Petersen and Rajan's (1994) reasoning and focus on firms that possess an existing line of credit with some financial institution. The underlying idea is that banks have open lines of credit for these firms and allow short-term lending. From the bank's point of view these firms are deemed creditworthy. In Table 7, we restrict the sample to respondents with an existing line of credit and rerun the main analysis. Results are similar, ruling out the role of a loose definition of discouragement in explaining our results.

[Insert Table 7 Around Here]

#### 4.3.4. *Restricting the sample to truthful respondents*

One issue that is common to all studies that use the WBES data, is that the dependent variables are based on the replies of the respondents, and one may have concerns as for their reliability. While it is not possible to eliminate such concerns, we conduct a test that could somehow mitigate them, to the extent that it is possible. In more detail, the WBES dataset

includes the interviewer's perception regarding the interviewee's responses to the questions, providing one for the following characterizations: (i) *Truthful*, (ii) *Somewhat truthful*, or (iii) *Not truthful*. In Table 7 we estimate the specification of Table 3 while restricting the sample to those respondents characterized as "Truthful". While the sample in Table 8 is reduced by around 44% in the case of "discouraged" and 25% in the case of "rationed" (compared to the one in Table 3), the main results hold. We continue to find that the *Secrecy* has a positive and statistically significant effect on the probability of being both discouraged and rationed.

[Insert Table 8 Around Here]

#### 4.3.5. *Endogeneity: Reverse Causality*

One could argue that the so far presented results are clouded by endogeneity due to simultaneous or reverse causality. As discussed in other studies on national culture and firm-level outcomes (e.g., Mourouzidou-Damtsa et al., 2019; Pasiouras et al., 2021), simultaneously causality is unlikely to be an issue given that it is difficult to argue that individual firm outcomes will cause changes in national culture. Mourouzidou-Damtsa et al. (2019), for example, highlight that national culture evolves slowly over very long periods and perceptions about cultural related aspects depend on personal attributes that are deeply rooted into societal characteristics. Still, one could be concerned that cultural secrecy is not perfectly exogenous to firms' access to credit and that repeated failures or successes to access credit affects the extent to which firms retain information, which in turn might lead to a culture of secretiveness.

To address this possibility, we resort on instrumental variable regressions. We instrument cultural secrecy by the historical proportion of cousin marriage. A growing body of research in anthropological studies has underlined the role of kinship in shaping group behaviors (e.g., Schulz et al., 2018) with cousin marriage playing a central role in this dynamic (e.g., Schulz et al., 2019; Shaw and Raz, 2015). Societies with strong kinship, resulting notably from more cousin marriage, display stronger in-group favoritism and stronger out-group defiance.

We follow this literature and postulate that societies characterised by a higher proportion of cousin marriage are more kin-oriented, with in-group favouritism and out-group defiance. These two characteristics are likely to positively covariate with secretiveness: societies that are more kin-oriented are likely to be more secretive because individuals prefer to restrain information from outsiders. For example, Jiang and Min (2023) mention that there appears to be a dark side in family relationships that can lead to a culture of secrecy. Along the same lines,

Miler and Le Breton-Miller (2021) highlight the unusual capacity and incentive for privacy and secrecy as a distinguishing characteristics of family firms. In short, cousin marriage is likely to be a relevant instrument for cultural secretiveness. To ensure that it is also an exogenous instrument, we employ the *pre-industrial* proportion of cousin marriage. We obtain the data from and construct the variable as in Giuliano and Nunn (2018).

We conduct a two stages IV regression and report the results in Table 9. Standard econometric tests on the instruments confirm our conceptual discussion. Based on the J-test, we find no evidence to suggest that the instruments are not exogenous, while the F-test that tests the joint significance of the two instruments shows that the instruments are relevant. The first stage shows a positive and significant relationship between the historical proportion of cousin marriage and a culture degree of secretiveness, in line with our theoretical expectations. The second stage shows that the instrumented *Secrecy* has a positive and statistically significant impact on the probability of both being discouraged and rationed.

[Insert Table 9 Around Here]

#### 4.3.6. *Endogeneity: Selection Bias*

Finally, our sample might be subject to a selection bias. Our study focuses on firms that stated that they needed a credit and rules out firms that replied that they did not need a credit. However, firms might answer that they do not need a credit, while actually needing one but believing they could not obtain it. From this perspective, stating a need for credit might reflect the likelihood of being discouraged.<sup>16</sup> This would pose a selection problem.

To address this possibility, we perform a two-stage Heckman regression.<sup>17</sup> We first model the likelihood of needing credit and calculate the associated lambda from this first-stage regression. We create the dummy variable *Need*, equal to 1 if the firm needs credit and 0 otherwise, that is, if the firm answered “No need of a credit” to question K17. We employ a probit model and regress the likelihood to need credit on firms’ characteristics. From this first-stage regression, we compute the associated Heckman lambda (inverse Mill’s ratio), then add it to the second-stage regression, which corresponds to our main model.

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<sup>16</sup> A good explanation of this concept is available from [Cole and Sokolyk \(2016\)](#)

<sup>17</sup> Alternatively, we also employ a bivariate probit model (e.g., [Freel et al., 2012](#)) that yields similar results.

Table 10 presents the results. In the case of discouragement, the lambda is positive and significant, suggesting the existence of a selection bias. Still, the positive and significant impact of the national culture of secrecy on the likelihood of being discouraged remains the same. Regarding firm's rationing, the lambda is insignificant and the main results do not change. In short, taking into consideration the selection bias associated with a negative claim about the need for credit does not impact our results.

#### 4.3.7. *Endogeneity: Omitted Variables*

Unobservable characteristics could be driving both the preferences for a national culture of secrecy and firm discouragement and rationing. Since our measure of cultural secrecy is time invariant at the country level, it is not possible to include country fixed-effects, leaving room for a potential omitted variable bias. We propose to reinforce our main models with (i) geographical sub-regional fixed-effects, based on the regional subdivision of the United Nations. For the 44 countries in our sample, this represents 24 geographical regions with similar economic and institutional characteristics. Adding their fixed effect partly controls for shared unobserved characteristics; (ii) these sub-regional fixed-effects multiplied by time. This second step saturates the models and is likely to absorb several unobserved characteristics on the credit market. Columns 1 to 8 of Table 11 report the results. They confirm the impact of the national culture of secrecy, both for borrowers' discouragement and rationing.

To assess the extent to which this setting resolves an omitted variable bias, we adopt [Oster's \(2019\)](#) approach. Her test is based on the notion that adding new control variables effectively tackles a potential omitted variable bias to the extent that this new set of control (a) leads to a substantial increase in the model's  $R^2$ ; (b) preserves the sign and significance of the variable of interest. As suggested in her work, "one approach to robustness is to assume a value for  $R_{\max}$  and calculate the value of  $\delta$  for which  $\beta = 0$ ." (p. 195). A cut-off of  $\delta = 1$  is proposed, beyond which unobservables would need to be more important than the observables to produce a treatment of zero. As a maximum  $R^2$ , we "adopt the assumption that the unobservables explain as much of the variation in the outcome as the observables do (...):  $R_{\max} = R_{\text{control}} + (R_{\text{control}} - R_{\text{uncontrol}})$ " [Oster \(2013, p.19\)](#). In our case, this is a more conservative approach than the sometimes  $1.3R_{\text{control}}$  used, as it is closer to  $2R_{\text{control}}$ . Assumed  $R_{\max}$  and computed delta values are reported below each model of Table 11. With the full set of regressors and fixed-effects (models 4 and 8), delta converges to 1, suggesting that the covariates tackle a potential omitted variable bias.



[Insert Table 11 Around Here]

## 5. Conclusions

Our results reveal that the culture of secrecy is positively and statistically significant associated with both the probability of being discouraged and the probability of being rationed. We show that it is through its effect of information asymmetries that cultural secretiveness hinders firms' access to credit. These findings remain robust across various tests and the inclusion of various firm-specific and country-specific variables. In particular, the results hold while controlling for sectoral credit risk, using alternative secrecy indicators, restricting the sample to respondents with an existing line of credit, and using estimation techniques to address endogeneity.

One important implication of these findings is that the culture of secrecy is an important omitted variable in earlier studies that examine cross-country differences in firm discouragement and rationing. Additionally, our results emphasize the need to take under consideration cultural differences when designing high-level policies to promote firm financing as well when designing and implementing policies that relate to the financial decision and strategies of the lending institutions.

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**Table 1 – Countries, Secrecy and Access to Credit**

The table below presents the list of the countries in the study, along with the value of our measure of secrecy (*Secrecy*), the percentage of firms that were discouraged (*Discouraged*), and firms that are rationed (*Rationed*).

Country	<i>Secrecy</i>	<i>Discouraged</i>	<i>Rationed</i>
Albania	140	0.377	0.130
Argentina	89	0.322	0.196
Bulgaria	125	0.529	0.099
Chile	126	0.087	
Colombia	134	0.129	0.129
Costa Rica	106	0.224	
Croatia	120	0.230	0.038
Czech Republic	73	0.088	0.046
Dominican Republic	80	0.159	0.112
Ecuador	137	0.179	0.211
Egypt	125	0.658	0.329
El Salvador	141	0.263	0.119
Estonia	40	0.114	0.144
Greece	125	0.440	0.178
Guatemala	188	0.270	0.100
Honduras	110	0.333	0.125
Hungary	48	0.231	0.065
Indonesia	112	0.691	0.279
Israel	40	0.030	0.010
Italy	49	0.474	0.279
Jamaica	19	0.359	
Jordan	105	0.589	0.353
Latvia	37	0.239	0.210
Lebanon	85	0.372	0.144
Lithuania	47	0.301	0.237
Malaysia	110	0.355	0.397
Malta	93	0.049	0.208
Mexico	133	0.280	
Morocco	92	0.491	0.440
Panama	170	0.167	
Peru	135	0.089	0.125
Philippines	106	0.250	0.152
Poland	101	0.285	0.144
Portugal	135	0.173	0.050
Romania	150	0.518	0.261
Russian Federation	149	0.515	0.354
Serbia	153	0.643	0.289
Slovak Republic	99	0.347	0.200
Slovenia	132	0.081	0.045
Sri Lanka	90	0.566	
Thailand	108	0.854	0.200
Turkey	114	0.346	0.102
Ukraine	162	0.683	0.394
Uruguay	124	0.158	0.190
Venezuela	145	0.133	

**Table 2 – Descriptive Statistics**

The table below presents the descriptive statistics of the variables employed in the analysis. The Diff. columns provide the t-statistic of mean differences across groups, with usual significance levels.

	<i>Panel A: Discouraged Analysis Sample</i>					<i>Panel B: Rationed Analysis Sample</i>				
	Mean	Std. Dev	Discouraged	Applied	<i>Mean Diff. Test</i>	Mean	Std. Dev	Fully Obtained	Rationed	<i>Diff.</i>
<b>Dependent variables</b>										
Discouraged	0.386	0.487								
Rationed						0.175	0.380	0.000	1.000	-1.000
<b>Independent variables</b>										
<i>Secrecy</i>										
Secrecy	120.031	30.453	118.045	123.197	-5.153***	113.635	32.773	112.866	117.253	-4.387***
<b>Control variables</b>										
Manager Experience	21.168	11.678	22.271	19.409	2.861***	23.073	11.731	23.668	20.272	3.395***
CEO Female	0.159	0.365	0.145	0.181	-0.036***	0.154	0.361	0.148	0.178	-0.030*
Log(Size)	3.518	1.423	3.781	3.099	0.682***	3.853	1.459	3.916	3.553	0.364***
Log(Age)	2.955	0.951	3.038	2.824	0.214***	3.101	0.972	3.108	3.071	0.037
Sole Ownership	0.393	0.488	0.340	0.477	-0.138***	0.320	0.466	0.317	0.331	-0.014
Limited Corp.	0.085	0.279	0.087	0.082	0.004	0.142	0.349	0.139	0.154	-0.015
Obstacle	0.278	0.448	0.242	0.335	-0.093***	0.213	0.409	0.174	0.394	-0.219***
Corruption	0.064	0.244	0.056	0.075	-0.019***	0.055	0.229	0.054	0.060	-0.006
F.S. Certified	0.487	0.500	0.563	0.365	0.198***	0.594	0.491	0.604	0.545	0.059***
Quality Certification	0.269	0.443	0.319	0.189	0.129***	0.339	0.474	0.355	0.264	0.091***
R&D	0.213	0.410	0.281	0.107	0.174***	0.237	0.425	0.238	0.228	0.010
Auditing Strength	4.736	0.535	4.833	4.581	0.252***	4.878	0.511	4.900	4.776	0.124***
Getting Credit score	69.108	14.480	68.936	69.382	-0.446*	67.478	15.117	67.256	68.524	-1.268*
Legal Efficiency	38.442	17.148	40.583	35.028	5.555***	40.352	18.283	41.052	37.060	3.991***
Inflation	5.875	5.455	5.780	6.026	-0.246**	5.235	5.770	5.187	5.462	-0.275
Financial Development	49.761	27.035	49.189	50.673	-1.484***	51.577	25.322	51.417	52.330	-0.914

<b>Alternative measures</b>										
Secrecy 2	74.235	37.925	70.905	79.543	-8.638***	64.891	40.06	63.852	69.783	-5.932***
Informal	0.484	0.500	0.497	0.463	0.034***	0.479	0.500	0.467	0.531	-0.064***
<b>Instrumental Variables</b>										
Catholic	0.378	0.403	0.478	0.218	0.260***	0.473	0.404	0.498	0.354	0.144***
Protestant	0.029	0.044	0.032	0.025	0.007***	0.035	0.052	0.036	0.031	0.005**
Other Christian	0.048	0.060	0.049	0.045	0.004***	0.043	0.054	0.043	0.041	0.002
Orthodox	0.158	0.246	0.123	0.215	-0.091***	0.103	0.215	0.097	0.136	-0.040***
Jewish	0.009	0.073	0.013	0.003	0.010***	0.025	0.131	0.029	0.003	0.026***
Muslim	0.231	0.353	0.181	0.311	-0.130***	0.215	0.343	0.196	0.304	-0.108***
Hindu	0.005	0.019	0.004	0.007	-0.003***	0.004	0.014	0.003	0.007	-0.005***
Buddist	0.030	0.143	0.015	0.054	-0.040***	0.010	0.079	0.010	0.015	-0.005
Eastern religion	0.008	0.039	0.008	0.008	0.000	0.011	0.048	0.009	0.023	-0.014***
Other religion	0.014	0.046	0.010	0.021	-0.011***	0.011	0.039	0.010	0.016	-0.006***
<b>Observations</b>	<b>22,123</b>					<b>6,478</b>				

**Table 3 – Main Results**

The table below presents logit regressions p-values are reported in parenthesis. The dependent variables are *Discouraged* and *Rationed*. *Discouraged* is a dummy variable taking one if the firm needed credit but decided not to apply; *Rationed* is a dummy variables taking one if the firm applied for credit but did not get accepted or did not obtain the full amount requested. The key independent variable is *Secrecy* which is a country-level measure of the degree of a country to maintain a high-level of secrecy in social interactions. \*, \*\*, and \*\*\* denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively.

	Discouraged	Rationed
Secrecy	0.001** (0.036)	0.004*** (0.000)
Manager Experience	-0.006*** (0.000)	-0.011*** (0.000)
CEO Female	0.043 (0.100)	0.031 (0.563)
Log(Size)	-0.149*** (0.000)	-0.088*** (0.000)
Log(Age)	-0.037*** (0.001)	0.027 (0.195)
Sole Ownership	0.052** (0.012)	-0.055 (0.245)
Limited Corp.	0.108*** (0.002)	0.071 (0.222)
Obstacle	0.208*** (0.000)	0.620*** (0.000)
Corruption	0.132*** (0.001)	-0.011 (0.891)
F.S. Certified	-0.329*** (0.000)	-0.053 (0.228)
Quality Certification	-0.116*** (0.000)	-0.100** (0.041)
R&D	-0.283*** (0.000)	0.082* (0.095)
Auditing Strength	-0.575*** (0.000)	-0.510*** (0.000)
Getting Credit score	0.007*** (0.000)	0.006*** (0.000)
Legal Efficiency	-0.002*** (0.002)	-0.009*** (0.000)
Inflation	0.016*** (0.000)	-0.024*** (0.000)
Financial Development	0.004*** (0.000)	0.005*** (0.000)
Sector dummies	Yes	Yes
Year dummies	Yes	Yes
Constant	2.753*** (0.000)	2.435*** (0.000)
Observations	22,123	6,478
Pseudo R <sup>2</sup>	0.176	0.100

**Table 4 – The Opacity Channel**

The table below presents a Structural Equation Model (SEM). The outcome variables are *Discouraged* and *Rationed*. *Discouraged* is a dummy variable taking one if the firm needed credit but decided not to apply; *Rationed* is a dummy variable taking one if the firm applied for credit but did not get accepted or did not obtain the full amount requested. The key independent variable is *Secrecy* which is a country-level measure of the degree of a country to maintain a high-level of secrecy in social interactions. We focus on the mediating role of firm’s opacity and employ two firm-level measures of opacity: whether the firm is externally audited or not (dummy variable *F.S. Certified*); and whether it possesses an international certification or not (*Quality Certification*). These two mediators are dummy variables equal to 1 when there is *less* opacity. \*, \*\*, and \*\*\* denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively.

Path	Direct effect	Indirect effect	Total effect	% Indirect effect to Total effect
<i>Panel A: Effect on Discouragement</i>				
Secrecy → F.S. Certified → Discouraged	0.006*** (7.80)	0.012*** (36.92)	0.018*** (12.21)	66.67%
Secrecy → Quality Certification → Discouraged	0.027*** (9.21)	0.062*** (22.27)	0.089*** (11.51)	69.66%
<i>Panel B: Effect on Rationing</i>				
Secrecy → F.S. Certified → Rationed	0.002*** (6.91)	0.028*** (12.61)	0.030*** (7.12)	93.33%
Secrecy → Quality Certification → Rationed	0.003*** (4.22)	0.031*** (7.07)	0.033*** (5.31)	93.93%

**Table 5 – Accounting for sectoral credit risk**

The table below presents logit regressions p-values are reported in parenthesis. The dependent variables are *Discouraged* and *Rationed*. *Discouraged* is a dummy variable taking one if the firm needed credit but decided not to apply; *Rationed* is a dummy variables taking one if the firm applied for credit but did not get accepted or did not obtain the full amount requested. The key independent variable is *Secrecy* which is a country-level measure of the degree of a country to maintain a high-level of secrecy in social interactions, we control for sectoral credit risk. \*, \*\*, and \*\*\* denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively.

	Discouraged	Discouraged	Rationed	Rationed
Secrecy	0.002*** (0.000)	0.003*** (0.000)	0.005*** (0.000)	0.005*** (0.000)
Manager Experience	-0.006*** (0.000)	-0.006*** (0.000)	-0.011*** (0.000)	-0.011*** (0.000)
CEO Female	0.034 (0.266)	0.027 (0.365)	0.008 (0.901)	0.008 (0.903)
Log(Size)	-0.156*** (0.000)	-0.157*** (0.000)	-0.070*** (0.000)	-0.069*** (0.000)
Log(Age)	-0.027** (0.027)	-0.026** (0.032)	0.018 (0.454)	0.019 (0.431)
Sole Ownership	0.031 (0.196)	0.030 (0.218)	-0.066 (0.276)	-0.068 (0.257)
Limited Corp.	0.048 (0.257)	0.046 (0.279)	0.182** (0.010)	0.181** (0.010)
Obstacle	0.182*** (0.000)	0.184*** (0.000)	0.669*** (0.000)	0.664*** (0.000)
Corruption	0.110** (0.026)	0.108** (0.028)	-0.115 (0.316)	-0.126 (0.275)
F.S. Certified	-0.328*** (0.000)	-0.329*** (0.000)	-0.037 (0.487)	-0.035 (0.520)
Quality Certification	-0.099*** (0.000)	-0.096*** (0.001)	-0.075 (0.198)	-0.071 (0.227)
R&D	-0.297*** (0.000)	-0.297*** (0.000)	0.053 (0.388)	0.052 (0.398)
Auditing Strength	-0.681*** (0.000)	-0.689*** (0.000)	-0.641*** (0.000)	-0.667*** (0.000)
Getting Credit score	0.013*** (0.000)	0.013*** (0.000)	0.008*** (0.001)	0.010*** (0.000)
Legal Efficiency	0.002** (0.015)	0.002** (0.012)	-0.006*** (0.007)	-0.004** (0.039)
Inflation	0.027*** (0.000)	0.027*** (0.000)	-0.021*** (0.001)	-0.021*** (0.002)
Financial Development	0.002*** (0.009)	0.001* (0.056)	0.006*** (0.000)	0.004*** (0.007)
Actuarial Spread 1Y (avg)	0.004 (0.878)		0.023 (0.684)	
Prob. of Default 1Y (avg)	-46.834 (0.761)		-179.001 (0.614)	
Actuarial Spread 1Y (dec)		-0.015 (0.303)		-0.053 (0.102)
Prob. of Default 1Y (dec)		61.102 (0.492)		281.716 (0.154)
Sector dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Constant	2.303*** (0.000)	2.376*** (0.000)	3.169*** (0.000)	3.312*** (0.000)
Observations	16,297	16,297	4,286	4,286
Pseudo R <sup>2</sup>	0.178	0.180	0.112	0.115

**Table 6 – Alternative Indicators of Secrecy**

The table below presents logit regressions T-values are reported in parenthesis. The dependent variables are *Discouraged* and *Rationed*. *Discouraged* is a dummy variable taking one if the firm needed credit but decided not to apply; *Rationed* is a dummy variables taking one if the firm applied for credit but did not get accepted or did not obtain the full amount requested. The two robustness variables are *Secrecy2* which is an alternative country-level measure of the degree of a country to maintain a high-level of secrecy in social interactions; and *Informal* which is a firm-level observations on how much the first estimates that its economic environment relies on informal mechanisms. \*, \*\*, and \*\*\* denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively.

	Discouraged	Rationed	Discouraged	Rationed
Secrecy2	0.001*** (0.001)	0.002*** (0.010)		
Informal			0.018** (0.039)	0.075* (0.075)
Manager Experience	-0.006*** (0.000)	-0.011*** (0.000)	-0.006*** (0.000)	-0.011*** (0.000)
CEO Female	0.044* (0.089)	0.029 (0.595)	0.041 (0.114)	0.028 (0.604)
Log(Size)	-0.149*** (0.000)	-0.088*** (0.000)	-0.150*** (0.000)	-0.087*** (0.000)
Log(Age)	-0.036*** (0.001)	0.027 (0.188)	-0.037*** (0.001)	0.026 (0.203)
Sole Ownership	0.053*** (0.010)	-0.056 (0.239)	0.051** (0.014)	-0.061 (0.199)
Limited Corp.	0.100*** (0.004)	0.063 (0.281)	0.109*** (0.002)	0.078 (0.175)
Obstacle	0.209*** (0.000)	0.619*** (0.000)	0.209*** (0.000)	0.612*** (0.000)
Corruption	0.132*** (0.001)	-0.012 (0.881)	0.131*** (0.001)	-0.022 (0.786)
F.S. Certified	-0.329*** (0.000)	-0.057 (0.192)	-0.330*** (0.000)	-0.057 (0.194)
Quality Certification	-0.119*** (0.000)	-0.095* (0.050)	-0.112*** (0.000)	-0.084* (0.087)
R&D	-0.283*** (0.000)	0.086* (0.082)	-0.282*** (0.000)	0.085* (0.084)
Auditing Strength	-0.589*** (0.000)	-0.428*** (0.000)	-0.546*** (0.000)	-0.341*** (0.000)
Getting Credit score	0.008*** (0.000)	0.005*** (0.001)	0.007*** (0.000)	0.004** (0.011)
Legal Efficiency	-0.003*** (0.000)	-0.007*** (0.000)	-0.002** (0.012)	-0.006*** (0.000)
Inflation	0.015*** (0.000)	-0.018*** (0.001)	0.018*** (0.000)	-0.012** (0.011)
Financial Development	0.004*** (0.000)	0.005*** (0.000)	0.004*** (0.000)	0.004*** (0.000)
Sector dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Constant	2.785*** (0.000)	1.728*** (0.000)	2.516*** (0.000)	1.205*** (0.006)
Observations	22,123	6,478	22,123	6,478
Pseudo R <sup>2</sup>	0.176	0.098	0.176	0.097



**Table 7 – Restricting the sample to respondent with existing line of credit**

The table below presents logit regressions p-values are reported in parenthesis. The dependent variables are *Discouraged* and *Rationed*. *Discouraged* is a dummy variable taking one if the firm needed credit but decided not to apply; *Rationed* is a dummy variables taking one if the firm applied for credit but did not get accepted or did not obtain the full amount requested. The key independent variable is *Secrecy* which is a country-level measure of the degree of a country to maintain a high-level of secrecy in social interactions. We focus our sample on respondent with existing line of credit. \*, \*\*, and \*\*\* denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively.

	Discouraged	Rationed
Secrecy	0.003*** (0.003)	0.004*** (0.000)
Manager Experience	-0.009*** (0.000)	-0.009*** (0.000)
CEO Female	-0.061 (0.150)	0.030 (0.644)
Log(Size)	-0.078*** (0.000)	-0.026 (0.178)
Log(Age)	-0.041** (0.016)	0.031 (0.221)
Sole Ownership	0.054 (0.107)	-0.093 (0.125)
Limited Corp.	0.174*** (0.001)	0.093 (0.190)
Obstacle	0.360*** (0.000)	0.515*** (0.000)
Corruption	-0.001 (0.990)	0.041 (0.671)
F.S. Certified	-0.201*** (0.000)	0.016 (0.760)
Quality Certification	-0.057 (0.121)	-0.093 (0.105)
R&D	-0.147*** (0.000)	0.100* (0.082)
Auditing Strength	-0.344*** (0.000)	-0.480*** (0.000)
Getting Credit score	0.006*** (0.000)	0.007*** (0.000)
Legal Efficiency	-0.003** (0.023)	-0.009*** (0.000)
Inflation	0.001 (0.775)	-0.021*** (0.001)
Financial Development	0.002* (0.059)	0.008*** (0.000)
Sector dummies	Yes	Yes
Year dummies	Yes	Yes
Constant	0.895* (0.061)	0.774 (0.304)
Observations	12,393	5,467
Pseudo R <sup>2</sup>	0.125	0.090

**Table 8 – Restricting the sample to Truthful respondents**

The table below presents logit regressions p-values are reported in parenthesis. The dependent variables are *Discouraged* and *Rationed*. *Discouraged* is a dummy variable taking one if the firm needed credit but decided not to apply; *Rationed* is a dummy variables taking one if the firm applied for credit but did not get accepted or did not obtain the full amount requested. The key independent variable is *Secrecy* which is a country-level measure of the degree of a country to maintain a high-level of secrecy in social interactions. We focus on truthful respondents. \*, \*\*, and \*\*\* denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively.

	Discouraged	Rationed
Secrecy	0.003** (0.019)	0.004*** (0.001)
Manager Experience	-0.004*** (0.001)	-0.012*** (0.000)
CEO Female	0.135*** (0.000)	0.050 (0.444)
Log(Size)	-0.143*** (0.000)	-0.063*** (0.002)
Log(Age)	-0.022 (0.162)	0.000 (0.996)
Sole Ownership	0.044 (0.110)	-0.082 (0.158)
Limited Corp.	0.012 (0.791)	0.128* (0.069)
Obstacle	0.170*** (0.000)	0.694*** (0.000)
Corruption	0.147*** (0.005)	-0.102 (0.339)
F.S. Certified	-0.328*** (0.000)	-0.015 (0.785)
Quality Certification	-0.075** (0.020)	-0.141** (0.017)
R&D	-0.286*** (0.000)	0.028 (0.636)
Auditing Strength	-0.481*** (0.000)	-0.509*** (0.000)
Getting Credit score	0.006*** (0.000)	0.007*** (0.000)
Legal Efficiency	-0.002* (0.072)	-0.007*** (0.000)
Inflation	0.029*** (0.000)	-0.018** (0.011)
Financial Development	0.007*** (0.000)	0.006*** (0.000)
Sector dummies	Yes	Yes
Year dummies	Yes	Yes
Constant	2.790*** (0.000)	1.915*** (0.005)
Observations	12,281	4,843
Pseudo R <sup>2</sup>	0.158	0.120

**Table 9 – IV Regression**

This table reports the coefficients and p-values (in brackets) of a two-steps Instrumental Variable Regression. In the first step, we instrument Secrecy based on the historical proportion of cousin marriage (*Cousin Index*). The two variables are expected to covariate in the same direction, with more cousin weddings associated with more kin-oriented communities, and more secrecy. The second step employs Secrecy instrumented and report the exogeneous effect of Secrecy on borrowers' discouragement and credit rationing. We report the exogeneity test (J-test) and the relevance test (F-test). Variances are robust to heteroscedasticity and clustered at the country level. \*, \*\*, \*\*\* denote statistical significance at the 10%, 5%, 1% level respectively. See the Appendix for the definitions of the variables.

	First step	
	Secrecy	
Cousin Index	1.901*** (0.001)	6.343*** (0.000)
	Second step	
	Discouraged	Rationed
Secrecy Instrumented	0.047*** (0.000)	0.044*** (0.000)
Control variables	All	All
Cluster	Country	Country
Constant	1.380*** (0.000)	14.624*** (0.000)
Observations	21,763	6,350
Exogeneity (J-stat)	0.312 (0.925)	1.700 (0.190)
Relevance (F-stat)	112.96 (0.000)	143.67 (0.000)

**Table 10 – Accounting for Selection Bias**

The table below presents logit regressions and a Heckman selection model. The dependent variables are *Need*, *Discouraged* and *Rationed*. *Need* is a dummy variable equals to one if the firm needs credit. This first-stage regression provides the Heckman's lambda (inverse Mill's ratio) that is then employed in the second stage regression to control for a selection bias. *Discouraged* is a dummy variable taking one if the firm needed credit but decided not to apply; *Rationed* is a dummy variables taking one if the firm applied for credit but did not get accepted or did not obtain the full amount that was requested. The key independent variable is *Secrecy* which is a country-level measure of the degree of a country to maintain a high-level of secrecy in social interactions. T-values are reported in parenthesis. \*, \*\*, and \*\*\* denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively.

	Need	Discouraged	Rationed
Secrecy		0.001** (0.032)	0.004*** (0.000)
$\lambda_1$		0.804*** (0.000)	
$\lambda_2$			0.467 (0.322)
Manager Experience	0.001** (0.049)	-0.005*** (0.000)	-0.013*** (0.000)
CEO Female	-0.012 (0.359)	0.044* (0.088)	0.047 (0.405)
Log(Size)	0.019*** (0.000)	-0.141*** (0.000)	-0.139*** (0.008)
Log(Age)	0.002 (0.627)	-0.033*** (0.002)	0.014 (0.576)
Log(Sales)	-0.005 (0.134)		
Sole Ownership	-0.025** (0.014)	0.040* (0.055)	-0.044 (0.361)
Limited Corp.	-0.036** (0.026)	0.080** (0.023)	0.114 (0.113)
Obstacle	0.734*** (0.000)	0.521*** (0.000)	0.687*** (0.000)
Corruption	-0.034** (0.047)	0.114*** (0.003)	0.034 (0.717)
F.S. Certified	0.033*** (0.002)	-0.341*** (0.000)	-0.161 (0.173)
Quality Certification	0.011 (0.360)	-0.102*** (0.000)	-0.138** (0.028)
R&D	0.114*** (0.000)	-0.226*** (0.000)	-0.018 (0.874)
Auditing Strength		-0.683*** (0.000)	-0.701*** (0.001)
Getting Credit score		0.010*** (0.000)	0.008*** (0.003)
Legal Efficiency		-0.005*** (0.000)	-0.009*** (0.000)
Inflation		0.014*** (0.000)	-0.018** (0.025)
Financial Development		0.007*** (0.000)	0.007*** (0.000)
Country dummies	Yes		
Sector dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Constant	0.215 (0.222)	2.442*** (0.000)	2.997*** (0.000)
Observations	87,225	22,123	6,478
Pseudo R <sup>2</sup>	0.097	0.179	0.100

**Table 11 – Omitted Variables Bias**

The table below presents OLS regressions; p-values are reported in parenthesis. The dependent variables are *Discouraged* and *Rationed*. *Discouraged* is a dummy variable taking one if the firm needed credit but decided not to apply; *Rationed* is a dummy variable taking one if the firm applied for credit but did not get accepted or did not obtain the full amount requested. The key independent variable is *Secrecy* which is a country-level measure of the degree of a country to maintain a high-level of secrecy in social interactions. Models 1 and 5 use no control variables; models 2 and 6 correspond to the main model in Table 3; models 3 and 7 add 24 subregional fixed-effects; models 4 and 8 interact these fixed effects with year fixed-effects. Oster’s (2019) delta is reported. This delta “can be interpreted as the degree of selection on unobservables relative to observables that would be necessary to explain away the result” (p.195). A delta at one suggests results robust to omitted variable bias. \*, \*\*, and \*\*\* denote an estimate significantly different from 0 at the 10%, 5%, and 1% level, respectively.

	Discouraged				Rationed			
Secrecy	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.005*** (0.000)	0.004*** (0.000)	0.003** (0.035)	0.004*** (0.004)
24 Sub-Regions FE	No	No	Yes	No	No	No	Yes	No
24 Sub-Regions × Years FE	No	No	No	Yes	No	No	No	Yes
Control variables	None	All	All	All	None	All	All	All
Observations	22,134	22,134	22,134	22,134	6,478	6,478	6,478	6,478
R <sup>2</sup>	0.002	0.210	0.238	0.240	0.003	0.094	0.114	0.115
Assumed R <sup>2</sup> <sub>max</sub>		0.418	0.474	0.478		0.185	0.225	0.227
Delta		0.6839	0.7825	0.9882		0.7253	0.8421	0.9984

## Appendix – Definition of variables

Variable	Definition
<b>Dependent variables</b>	
Discouraged	Dummy variable equals to 1 if the firm is discouraged (i.e., decides not to apply), 0 if it has applied for credit.
Rationed	Dummy variable equals to 1 if the firm is rationed in its last loan request, 0 if it is fully provided.
<b>Independent variables</b>	
<i>Secrecy</i>	
Secrecy	Indicator of a national culture of secrecy. It is the sum of uncertainty avoidance (UA) and power distance (PD) scores less the individualism (IND) score of the Hofstede's national culture indicators.
<i>Control variables</i>	
Manager Experience	Manager experience (in years).
CEO Female	Dummy variable equals to 1 if the manager of the firm is a woman, 0 otherwise.
Log(Size)	Natural logarithm of firm's total assets.
Log(Age)	Natural logarithm of firm's age.
Sole Ownership	Dummy variable equals to 1 if the firm has only one owner, 0 if it has more.
Limited Corp.	Dummy variable equals to 1 if the firm is a limited corporation, 0 otherwise.
Obstacle	Dummy variable equals to 1 if the firm considers that access to finance is a "Major Obstacle" or a "Very Severe Obstacle", 0 otherwise.
Corruption	Dummy variable equals to 1 if the firm considers that "Corruption" to finance is a "Major Obstacle" or a "Very Severe Obstacle", 0 otherwise.
F.S. Certified	Dummy variable equals to 1 if the firm's annual financial statements are checked or certified by an external auditor.
Quality Certification	Dummy variable equals to 1 if the firm owns a quality certification, 0 otherwise.
R&D	Dummy variable equals to 1 if the firm has spendings on formal R&D activities, 0 otherwise.
Auditing and Reporting Strength	Country aggregate of response to the World Economic Forum's Executive Opinion Survey question "In your country, how strong are financial auditing and reporting standards?" [1 = extremely weak; 7 = extremely strong].  This measure reflects the following two dimensions: (i) legal rights with respect to secured transactions, (ii) the reporting of credit information. The first dimension measures whether certain features that facilitate lending exist within the applicable collateral and bankruptcy laws. The second dimension measures the coverage, scope and accessibility of credit information available through credit reporting service providers such as credit bureaus or credit registries
Getting Credit score	Measure the efficiency of the debt enforcement procedure for each country, defined as the present value of the terminal value of the firm after bankruptcy costs. Higher scores indicate more efficient debt enforcement processes.
Legal Efficiency	Rate of inflation
Inflation	Domestic banking credit to the private sector, as a share of GDP
Financial Development	
<b>Alternative measures</b>	
Secrecy 2	Alternative indicator of a national culture of secrecy. It is the sum of uncertainty avoidance (UA) and power distance (PD) scores less the individualism (IND) score, less the masculinity (MASC) score of the Hofstede's national culture indicators
<b>Instrumental Variables</b>	
Cousin Marriage	Proportion of pre-industrial ancestors of a country that favour cousin marriage. The variable is obtained from and calculated as in Giuliano and Nunn (2018, p.13).