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ABSTRACT

We study the relationship between culture and the use of collateral in corporate borrowing. Using a dataset of over 14,000 firms from 70 transition and developing countries, we find evidence that the likelihood to pledge collateral is lower in countries with higher uncertainty avoidance and corporate ethical behavior. In contrast, long-term orientation and individualism enhance the likelihood to use collateral. These results hold when using subsamples and further controls for various firm and country-specific attributes. Additional analysis reveals that culture influences not only the likelihood to pledge collateral but also its type (movable versus non-movable) and its value relative to the value of the loan.

Keywords: Culture · Ethics · Collateral.

JEL Classification: G21, G32, G41.

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1 Introduction

The use of collateral is a common feature of loan contracts, aiming to reduce the risk of lending due to informational asymmetry, adverse selection and moral hazard. As these problems can be amplified in less developing countries, the request for collateral can be even higher in these cases (Menkhoff et al., 2012; Hanedar et al., 2014). For example, data from the latest Enterprise Survey of the World Bank show that 79% of the loans originated in 139 developing countries required collateral[1]. However, the use of collateral varies widely among countries with the proportion of loans requiring collateral ranging from 23% in Brazil to 100% in Guinea and Sudan.

A question that naturally emerges is: what really drives the large variation in the use of collateral across countries? Surprisingly, despite the important role of collateral there has been little empirical research on the determinants of collateralized borrowing in a cross-country setting (Nguyen and Qian, 2012). Additionally, many studies focus on mature markets like the U.S. and Europe, and there is considerably less evidence for developing countries (Menkhoff et al., 2012). The present study examines whether and how national culture influences the use of collateral. While economists were until recently reluctant to rely on culture as a possible driving factor of economic phenomena, more recently a growing strand of the literature documented that culture influences various economic, financial and managerial decisions (Guiso et al., 2006; Castellani, 2018). However, the impact of national culture on the use of collateral has been thus far neglected.

Our work builds on three strands of the literature. First, we extend earlier work on the factors that drive the use of collateral. These studies document that various country-level attributes are important determinants of collateral. For example, Jimenez et al. (2006) find that credit market concentration and macroeconomic conditions influence the likelihood of collateral use. Additionally, many studies examine the role of formal institutions; however, the results are mixed. Qian and Strahan (2007) find that creditor rights do not have a statistically significant impact on the use of collateral; however, collateral is used more frequently in the French legal origin countries and less frequently in the German legal origin countries (relatively to countries with English legal origin). Hanedar et al. (2014) also conclude that legal rights and the origin of the countries' legal system are not statistically significant drivers of the likelihood to pledge collateral. However, they find that the use of collateral is associated with other location characteristics. In contrast, Nguyen and Qian (2012) find that firms in countries with better institutions (rule of law and regulatory quality) and depth of credit information are less likely to pledge collateral for their loans. Qi et al. (2011) reach a similar conclusion while focusing on the corporate bonds market. Using a sample of foreign bonds issued in the US from around 50 countries, they find that bonds of firms incorporated in countries with stronger credit rights use fewer covenants.

Second, we extend recent work on the impact of national culture on loan terms. These studies conclude that national culture explains cross-country variations in debt maturity (Zheng

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[1]Data from the survey do not correspond to the same year for all countries. For example, the latest data for Brazil are from 2009, the ones for Guinea from 2016, and those for Sudan from 2014. However, the variation in the figures is not due to time differences. For example, 28.9% of the loans in Turkey in 2013 and 27.8% of the loans in Paraguay in 2017 required collateral

et al., 2012) and cost (Chui et al., 2016). Giannetti and Yafeh (2012) provide further evidence from the syndicate loan market, showing that more culturally distant lead banks offer borrowers smaller loans at a higher interest rate and are more likely to require third-party guarantees. Finally, He and Hu (2016) find that firms in U.S. counties with a high level of religiosity are charged lower interest rates, have large loan amounts and fewer loan covenants. While the last two studies consider the use of some kind of collateral, we differentiate our work in two very important respects. First, as already mentioned, Giannetti and Yafeh (2012) focus on the syndicated market, where loans are typically extended from large multinational banks to large borrowers in both developed and developing countries. In contrast, the WBES that we utilize covers loans from various types of banking and non-banking institutions (microfinance institutions, credit cooperatives) not only to large but also to small and medium enterprises in developing countries. Second, the analysis of He and Hu (2016) is limited to the U.S. and it focuses on religion rather than culture per se.

Third, in a more general context, our work relates to studies investigating the impact of national culture on various financial decisions and firm outcomes, like corporate investment (Shao et al., 2013; Nahata et al., 2014), corruption in bank lending (Zheng et al., 2013), capital structure (Chui et al., 2002; Li et al., 2011), trade credit (El Ghoul and Zheng, 2016), cash holdings (Chen et al., 2015b), firm growth (Boubakri and Saffar, 2016), risk-taking (Li et al., 2013; Gaganis et al., 2019), dividend policy (Shao et al., 2010), and innovation (Chen et al., 2017). None of these studies explores the impact of national culture on the likelihood to pledge collateral.

The present paper aims to bring together these groups of studies and fill a gap in the literature. We focus on three of Hofstede's national culture dimensions that we consider particularly relevant to our work, namely uncertainty avoidance, individualism, and long-term orientation. We complement this with information on the ethical behavior of firms from the executive opinion survey of the World Economic Forum (WEF). While the corporate ethical behavior has not received the attention of the Hofstede indicators in past empirical studies on national culture, we consider this to be another important dimension of a country's cultural environment. For example, Weiss (2009) highlights that the moral standards vary from one culture to another, and what is morally right for one society or culture may be wrong for another. Pitta et al. (1999) also point to the association between a country's culture and the ethical behaviour of its managers, arguing that this behaviour is exhibited in the following two main ways: (i) by overt actions such as public or corporate statements and actions about ethical behaviour, and (ii) by the collection of the group of ethical attitudes and values. Thus, in the present study we adopt a broad definition of culture, considering it an umbrella of both observed and unobserved traits related to deeply-rooted social, psychological and other informal institutional characteristics of the societies that were shaped in the past and are transferred from one generation to another[2].

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[2]Scholars have put forward various definitions of culture. For example, Hofstede et al. (2010) define culture as the collective programming of the mind distinguishing the members of one group or category of people from others. Guiso et al. (2006) refer to beliefs and values that are being transmitted fairly unchanged from one generation to another. Similarly, House et al. (2004) define culture as the shared motives, values, beliefs, identities, and interpretations or meanings of significant events that result from common experiences of members of collectives that are transmitted across generations.

Using information from the World Bank's Enterprise Survey (WBES) for a large sample of 14,364 firms operating in 70 transition and developing countries for the years 2003-2017, we obtain three interesting results. First, using an ordered logit model we find support for the hypothesis that culture is an important determinant of the likelihood to pledge collateral. In particular, we find that uncertainty avoidance and corporate ethical behavior have a negative association with the use of collateral, whereas we observe the opposite in the case of long-term orientation and individualism. These results are robust to controls for various firm and country-specific attributes and the use of sub-samples. Second, the use of a continuation logit model shows that most cultural indicators influence the type of collateral used, that is whether the firm pledges movable versus non-movable assets. Third, Tobit regressions show that the value of the collateral (in relation to the value of the loan) is also associated with some national culture dimensions.

The rest of the paper is structured as follows. Section 2 contains a background discussion on culture and its expected association with collateralized borrowing. Section 3 presents the data, variables, and methodology. Section 4 discusses the empirical results. Section 5 concludes the study.

2   Background Discussion

Guiso et al. (2006) identify the difficulties in designing testable hypothesis when referring to a broad topic as culture as one of the main reasons for which economists were traditionally reluctant to incorporate culture in their analysis. However, as they argue in follow up discussion, the emerge of more data allowed the identification of systematic differences in people's preferences and beliefs and their association with various measures of culture. In this section and the empirical analysis that follows, we focus on three national culture indicators from Hofstede (1980) that we consider particularly relevant in the context of the present study. These are the Uncertainty Avoidance Index (UAI), the Individualism index (IND), and the Long-Term Orientation index (LTO). These indicators have been used in numerous studies and are in general well regarded in the empirical literature. Additionally, we discuss the role of corporate ethnics and how they could influence the use of collateral.

UAI was constructed by Hofstede (1980) based on answers to questions related to job stress, rule orientation, and intention for a long- term career in the same firm. At the country level, uncertainty avoidance relates to "the extent to which a culture programs its members to feel either uncomfortable or comfortable in unstructured situations" (Hofstede 2001, p.19). Hofstede et al. (2010) discusses various characteristics of strong uncertainty societies in relation related to work, organization, and motivation. More detailed, they highlight that in strong uncertainty avoidance societies: (i) there is an emotional need to be busy and work hard, (ii) time is money, (iii) there is need for precision and formalization, (iv) there is a belief in experts and technical solutions, and (v) top managers are concerned with daily operations. In general, higher values of UAI indicate a society characterized by higher uncertainty avoidance. The rationale for the investigation of the role of uncertainty avoidance is associated with the primary function of collateral that is to mitigate risk in lending. In general, countries with a high uncertainty avoidance index have rigid codes of belief and behavior, and they are intolerant of

unorthodox behaviour and ideas. The literature also suggests that in countries with a culture of higher uncertainty avoidance, firms take lower risks (Kreiser et al., 2010; Li et al., 2013; Gaganis et al., 2019), and they have higher trade credit provision (El Ghoul and Zheng, 2016), higher cash holdings (Chen, et al., 2015b), and higher externally financed growth (Boubakri and Saffar, 2016). Based on these attributes we hypothesize that in countries characterized by higher uncertainty avoidance, firms will not take excessive risks and lenders will feel, in general, more confident that their loans are secured without the need for collateral.

Hofstede (1980) constructed the individualism (versus collectivism) dimension (IND) based on answers to questions related to work goals like having personal time, the freedom to adopt own approach to the job, a challenging work to do, training opportunities, good physical working conditions, and use of skills and abilities on the job. Hostede et al. (2010) highlights that the first three questions reveal a tendency towards individualism whereas the last three questions are associated with collectivism. This dimension describes the relationship between the individual and the collectivity which prevails in a given society (Hofstede, 1980) or, in other words, it reveals the extent to which people's self-image is defined in terms of "I" or "we." Higher (lower) figures of IND indicate a society characterized by higher individualism (collectivism). The impact of individualism is ambiguous. On the one hand, individualism has been associated with overconfidence (Chui et al., 2010; Ferris et al., 2013) which may have both positive and negative outcomes for firms. For example, Shao et al. (2013) and Chen et al. (2017) find that firms in individualistic countries invest more in R&D, they generate more, and higher impact patents and they are more efficient in converting R&D into innovative output. In this case, given the intrinsic value of firms originating from overconfidence, individualism could be negatively associated to the likelihood of collateral use. On the other hand, managerial overconfidence can lead to corporate investment distortions (Malmendier and Tate, 2005), and firms led by overconfident CEOs may be less responsive to corrective feedback in improving management forecast accuracy (Chen et al., 2015a). The literature also suggests that individualism is positively related to the magnitude of earnings discretion (Han et al., 2010), and corporate risk-taking (Li et al., 2013). These attributes could distort firm value and therefore lead to higher collateral requirements. At the same time, the low side of the individualistic cultural dimension - collectivism - represents a preference for a tightly-knit social framework in which individuals can expect their relatives or members of a group to look after them in exchange for unquestioned loyalty. In this case, should borrowers run into financial difficulties they could seek support from their families. This could serve as a substitute for the need of collateral. So, we would expect a negative (positive) relationship between collectivism (individualism) and the use of collateral.

The third cultural dimension of long-term versus short-term orientation was integrated into Hofstede's framework in 1991, and refers to "the extent to which a culture programs its members to accept delayed gratification on their material, social, and emotional needs" (Hofstede 2001, p.20). Hofstede et al. (2010) also mention that "long-term orientation stands for the fostering of virtues oriented toward future rewards-in particular, perseverance and thrift. Its opposite pole, short-term orientation, stands for the fostering of virtues related to the past and present-in particular, respect for tradition, preservation of "face," and fulfilling social obligations" (p. 239). The impact of LTO on the likelihood to pledge collateral is ambiguous. On

the one hand, in a country with a high LTO investment opportunities are evaluated based on their long-term value rather than short-term rates of return. Additionally, the sense of shame in cases of failure and bankruptcy would make the managers cautious and discourage the engagement in short-term and risky opportunities (Chang and Noorbakhsh, 2009). All these may result in long-term value, lower risk, and sustainability and they could in theory translate into lower collateral requirements. On the other hand, Antonczyk et al. (2014) highlight that the implementation of profitable long-term projects can be subject to particularly severe agency problems since such projects might be exposed to financial distress in interim periods due to reasons unrelated to project quality (Chemmanur and Fulghieri, 1994). Chemmanur and Fulghieri (1994) and Antonczyk et al. (2014) discuss that when the financial distress is associate with the the poor quality of the projects then it may be optimal for the lenders to liquidate the firm; however, when the financial distress can be attributed to reasons unrelated to project quality it might be optimal to allow the firm to continue under a debt renegotiation agreement. The authors also highlight that the lenders will have to devote additional resources to discriminate between the two situations and evaluate firms (Chemmanur and Fulghieri, 1994) and charge a higher interest rate (Antonczyk et al., 2014). In the present study, we hypothesize that under this scenario, an alternative strategy adopted by banks could be to ask for collateral.

Weiss (2009) argues that "doing the right thing" matters to firms and various stakeholders, and he discusses various reasons for this. For example, acting legally and ethically may result in savings of billions of dollars each year in lawsuits, settlements and theft. Other costs of unethical behavior, include deterioration of relationships, damage to reputation, and declining employee productivity, creativity and loyalty. Building on past studies, Key and Popkin (1998) also highlight that "Analysis of corporate failures and disasters strongly suggests that incorporating ethics in before-profit decision making can improve strategy development implementation and ultimately maximize corporate profits" (p. 331). Along the same lines, Guiso et al. (2015) conclude that the employees' perception for the trustworthiness and ethics of the top managers is positively associated with firm performance. Finally, in a study that is more closely related to our work, Kim et al. (2014) assert that business ethics may be an important element in contracting bank loans. The main argument is that an ethical borrower does not lie, cheat or steal and behaves honestly. Therefore, ethical borrowers are perceived as less risky and banks will not need to monitor such borrowers intensively to prevent their opportunistic behavior. Using data from syndicated loans, Kim et al. (2014) confirm that ethical behavior leads to lower loan rates. Therefore, we hypothesize that ethical behavior will have a negative impact on the likelihood to request collateral.

3 Data, Variables and Methodology

3.1 Data

We use data from various sources. Firm-level data are obtained by the World Bank's Enterprise Surveys[3]. These Surveys were initiated in 2002 and they cover firm-specific attributes and a broad range of business environment topics. For most countries, an Enterprise Survey is conducted about every 3-4 years. While the surveys were initially conducted by different units within the World Bank, since 2005-06 most data collection efforts have been centralized within the Enterprise Analysis Unit. This resulted in a unified set of core survey questions and a consistent application of survey methodology across countries. Therefore, to ensure consistency the present study uses data from surveys conducted in the post 2005-2006 period. Some firms in the sample are included only once in the Surveys, whereas others may participate more than once. Our final working sample covers 14,364 firms from 70 transition and developing countries, that obtained a loan over the period 2003 to 2017.

Information on the national culture dimensions is from Hofstede et al. (2010) and Hofstede Insights[4]. Information on the perceived ethical behavior of firms in each country is from the executive opinion survey of the World Economic Forum. Data for the control variables are collected from various databases of the World Bank. More precisely, data on the depth of credit information are from the Doing Business project. Information on GDP per capita is from the World Development Indicators database. Country-level aggregated banking sector indicators are from the Global Financial Development Database. Information on institutional development is from the Worldwide Governance Indicators project.

3.2 Variables and Methodology

The dependent variable is a dummy variable that takes the value of 1 if the firm has pledged collateral to obtain a loan and 0 otherwise. This dummy is constructed considering the answer to the following question in the WBES: "Referring only to this most recent loan or line of credit, did the financing require collateral?"

The key independent variables are the Uncertainty Avoidance Index (UAI), the Individualism index (IND), and the Long-Term Orientation index (LTO) discussed in section 2. As a proxy for the perceived ethical behavior of firms (ETHICS) we consider the answer to the following question from the Executive Opinion Survey of the World Economic Forum (WEF): "In your country, how do you rate the corporate ethics of companies (Ethical behavior in interactions with public officials, politicians, and other firms)?" The answer to this question may range from 1 to 7, with higher figures indicating higher ethical behavior and vice versa. WEF then aggregates the individual answers to an overall country indicator.

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[3]The Enterprise Surveys implemented in European and Central Asian countries are also known as Business Environment and Enterprise Performance Surveys (BEEPS) and are jointly conducted by the World Bank Group, the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), and the European Commission (EC). Enterprise Surveys in Latin America are jointly funded with the Inter-American Development Bank (IDB). Enterprise Surveys in the Middle East and North Africa are jointly funded with EBRD and the EIB.

[4]https://www.hofstede-insights.com/

Following past studies, we control for various firm-level characteristics. Size is a dummy variable that takes the value of one in the case of small-medium enterprises (SMEs) and the value of zero in the case of large firms. The impact of size is ambiguous. On the one hand, smaller firms can be informal, more opaque and less reputable. This could result in a higher likelihood of collateralized borrowing. On the other hand, Nguyen and Qian (2012) find that small firms are less likely to provide collateral than larger firms. They argue that one potential reason is that small firms do not have assets for collateral, and they therefore rely more on reputation and personal relationships as substitutes to collateral. The results of Voordeckers and Steijvers (2006) confirm that larger firms are more likely to pledge collateral. The literature suggests that older firms are less likely to have to provide collateral (Nguyen and Qian, 2012; Duarte et al., 2017; Meles et al., 2017). Therefore, we control for firm age estimated as the difference between the year of the loan and the year of the firm's establishment. We also control for the existence of an internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). Firms with certifications may have higher repayment capability, resulting in lower likelihood of a collateral requirement. The results of Nguyen and Qian (2012) and Duarte et al. (2017) confirm this argument. Finally, we control for managerial experience using the years of working experience of the top manager in the sector. Duarte et al. (2017) find evidence that firms with a top manager who has a high degree of experience are less likely to provide collateral. Nguyen and Qian (2012) argue that the negative relationship between experience and the use of collateral may be attributed to expectations that more experienced managers can achieve higher performance and have good relationships with lending institutions, thereby reducing the need for collateral. However, in contrast to Duarte et al. (2017), their results provide only weak evidence to support this argument[5].

Additionally, our baseline regression includes two country-level attributes. To account for the effects of information-sharing on collateral requirements we use the depth of credit information index from the World Bank Doing Business project (Nguyen and Qian, 2012; Hanedar et al., 2014; Duarte et al., 2017). This index measures rules and practices affecting the coverage, scope and accessibility of credit information available through either a credit bureau or a credit registry. Higher values indicate the availability of more credit information. Therefore, we expect a negative relationship with the requirement of collateral. Finally, to capture the effect of the overall economic development of the countries we use the GDP per capita, as in Nguyen and Qian (2012), Hanedar et al. (2014), and Duarte et al. (2017). Considering the binary nature of the dependent variable we use an ordered logistic regression model of the following form:

$$Pr(\text{Collateral}_{ikt} = 1 \mid \text{Culture}_k, \textbf{Firm}_{it}, \textbf{Country}_{kt}, \textbf{Year}_t, \textbf{Sector}_i; \beta) =$$
$$= F(\beta_0 + \beta_1 \text{Culture}_k + \beta_2^T \textbf{Firm}_{it} + \beta_3^T \textbf{Country}_{kt} + \beta_4^T \textbf{Year}_t + \beta_5^T \textbf{Sector}_i), \quad (3.2.1)$$

where $F(x)$ is the sigmoid function $\frac{1}{1+e^x}$, index i denotes firms, k refers to countries and t is the temporal index. 'Collateral' is the dummy variable revealing whether the firm pledged

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[5]Managerial experience enters their regressions with a negative sign which is statistically significant at the 10% level. However, this becomes insignificant in further regressions where they control for country characteristics.

collateral or not. 'Culture' denotes the national culture or corporate ethics proxies. 'Firm' is a vector of firm-level covariates and Country is a vector of macro-level covariates discussed above. Additionally, all regressions include time ('Year') and industry ('Sector') dummies to capture the temporal and sectoral heterogeneity.

4 Empirical results

4.1 Baseline results

Table 1 presents the correlation coefficients. Table 2 presents descriptive statistics. Approximately 64% of the firms in our sample are SMEs. Overall, around 75% of the firms provided collateral to receive bank loans, of which 36.84% are large firms and 63.16% are SMEs (unreported tabulation based on our sample). Very similar distributions hold for the remaining 25% of the firms that did not pledge collateral. Turning to the longevity of the firms in our sample, the typical number of years in operation ('Age') is 20, which roughly coincides with the typical years of managerial experience.

<div align="center">[Insert Tables 1 and 2 Around Here]</div>

Table 3 presents the estimations of the ordered logit model shown in equation (3.2.1). In all the cases we present the odds ratios. Thus, a ratio higher (lower) than 1 describes a positive (negative) relationship. Consistent with our expectations, firms operating in countries characterized by higher uncertainty avoidance are less likely to pledge collateral. More detailed, the odds ratio reveals that for a one unit increase in UAI the odds of pledging versus non-pledging collateral are 0.986 times lower, given that the other variables in the model are held constant. To give an example, with a UAI of 50 in Kenya and a UAI of 60 in Angola, the odds of pledging collateral in Angola are 9.86 times lower. In contrast, the probability of the presence of collateral in loan contracts is higher in countries with a culture of individualism and long-term orientation. The odds ratio shows that a one unit increase in IND increases the odds of pledging collateral by 1.003 times. The corresponding figure for LTO is 1.016. Finally, the probability of the presence of collateral in loan contracts is lower in countries with higher corporate ethics of companies. Again, the economic significance is not legible. For instance, with ETHICS scores of 3.33 and 5.55 in Ukraine and Chile respectively, the odds of pledging collateral in Chile are approximately 1.6 times lower than in Ukraine.

<div align="center">[Insert Table 3 Around Here]</div>

Turning to the control variables, consistent with our expectations, firm age, GDP per capita and the depth of credit information have a negative and statistically significant impact on the use of collateral. We also find that SMEs are less likely to pledge collateral than large firms. While this contradicts a general belief, it is consistent with the findings of earlier studies (Nguyen and Qian, 2012; Voordeckers and Steijvers, 2006). According to our results, the odds of providing collateral are about 0.9 times lower for SMEs than for large firms, given the other variables are held constant. Finally, the experience of the managers and a certificate of quality do not have a statistically significant impact on the likelihood of collateral use.

4.2 Further analysis

In this section, we discuss several robustness tests. First, we estimate further specifications controlling for additional firm-specific and country-specific attributes. Second, we re-estimate our baseline specification using various sub-samples. Third, we account for the type of collateral, distinguishing between movable and non-movable collateral. Fourth, we examine the relationship between culture and the value of collateral pledged relatively to the value of the loan.

4.2.1 Additional controls

First, we control for the following three firm-specific characteristics: financial openness, trade credit, and female ownership. Information for all these variables is from the WBES. Financial openness (FINOP) is an indicator showing whether the firm has checking or savings accounts and overdraft facility. This variable may take the values of zero (no checking/savings account or overdraft), one (the firm has either checking/savings account or overdraft) or two (the firm has both checking/savings account and overdraft facility). Duarte et al. (2017) find financial openness to be negatively associated with the probability of collateral requirement and Nguyen and Qian (2012) report a negative relationship between the existence of an overdraft facility and the likelihood to pledge collateral. Our results, shown in Table 4, confirm these findings[6]. Past studies show that trade credit (TRCREDIT) can be negatively associated to the use of collateral (Voordeckers and Steijvers, 2006; Duarte et al., 2017). To account for trade credit we use the percentage of the material inputs or services that were paid after delivery (Duarte et al., 2017). Our results show that the coefficient of TRCREDIT is insignificant. The literature also suggests that women-owned firms are more likely to put up collateral than men-owned ones (Riding and Swift, 1990; Coleman, 2000). Therefore, we use a dummy variable that indicates whether there are females among the owners of the firm (FEMALE). Consistent with our expectations, FEMALE enters the regressions with a positive coefficient; however, this is not statistically significant. The inclusion of these three firm-specific attributes in the regressions, does not influence our main findings.

[Insert Table 4 Around Here]

Then we control for market concentration in the banking sector (CONC). We use this as a general proxy for competition, with higher figures indicating that only a few banks dominate in the market, and hence there is a lower degree of competition. Recent theoretical and empirical work points to the existence of a negative relationship between the presence of collateral and bank competition (Voordeckers and Steijvers, 2006; Hainz et al., 2013). The estimations in Table 5 are consistent with these findings with CONC entering the regressions with a positive and statistically significant coefficient in most of our specifications. The main results hold.

[Insert Table 5 Around Here]

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[6]We also replace financial openness with a dummy variable showing the existence of overdraft facility as in Nguyen and Qian (2012). We find overdraft to be negatively related to the likelihood to pledge collateral. The main results remain the same.

Third, we control for the institutional environment (INSTIT) in the country where the firms operate. Nguyen and Qian (2012) point out that better legal and regulatory environment allow better contract monitoring and enforcement and hence lower need for collateral. We use information from the World Bank's Worldwide Governance Indicators project and calculate an overall index as the average of the following six indicators: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, control of corruption. INSTIT enters the regressions with a negative and statistically significant coefficient. In other words, institutional development is associated with a lower likelihood of collateral requirements. The inclusion of INSTIT in the regressions does not influence our main findings. The results are reported in Table 6.

[Insert Table 6 Around Here]

4.2.2 Using sub-samples

First, we exclude the years of the crisis from the analysis, as the requirements for collateral may differ during turbulent periods. The results, reported in Table 7, are qualitatively the same with the ones presented in earlier Tables. Second, following Yaldiz Hanedar et al. (2014) we re-estimate the baseline specification by firm size. While the regression presented so far control for size, this does not allow us to examine whether the coefficients of the variables of interest vary by firm size. Therefore, in Table 8 we present separate regressions for SMEs and for large firms. The results hold. Third, we focus on loans granted by private banks. More detailed, the loans used in our analysis so far are from the following types of credit institutions: private banks, state owned/government agencies and non-bank financial institutions. However, different credit institutions may have different policies for collateral requirements (Nguyen and Qian, 2012). Thus, we restrict our sample to loans from private banks representing 86% of the sample. With the exception of individualism that becomes insignificant, the results in Table 9 remain the same.

[Insert Tables 7, 8 & 9 Around Here]

4.2.3 Type of collateral

The second question that we aim to answer is whether national culture and the perception regarding the firms' ethical behavior influences the type of collateral. Previous studies distinguish between outside and inside collateral (Meles et al., 2017) or business collateral and personal commitments (Voordeckers and Steijvers, 2006; Duarte et al., 2017). We follow a similar approach but distinguish between movable and non-movable collateral. Love et al. (2016) highlight a mismatch between the collateral that firms have and the collateral the banks will accept. They mention that firms, especially those in developing countries can pledge movable assets as the main type of collateral. However, banks in developing countries prefer non-movable assets and are typically reluctant to accept movable assets due to the weak and ineffective legal protection.

Following Voordeckers and Steijvers (2006) and Duarte et al. (2017) we estimate a continuation-ratio logit model that is particularly useful when a sequential mechanism determines the re-

sponse outcome as in our context. In principle, we apply the continuation-ratio logit model by estimating a system of two binary logit models, as our dependent variable comprises of 3 ordinal outcomes. The first estimates the choice between no collateral and movable collateral that essentially serves as a form of soft collateral. The second model estimates the choice between non-movable collateral that serves as a form of hard collateral and the other two categories (i.e. movable collateral and no collateral). For the estimation of the continuation ratio logit model we employ the approach described in Fagerland (2014).

In Table 10, there are two columns for each independent variable of interest. The left ('Logit 1') shows the results of the first logit model that reveals the probability of a firm being asked only for a "soft" type of collateral. The results seem to be in line with the ones in Section 4.1. In particular, UAI and ETHICS are negatively associated with the likelihood of a firm pledging collateral, whereas IDV and LTO are positively associated. The accompanying right hand side column ('Logit 2') shows the results of the second logit model that reveals the probability of a firm being asked a "hard" type of collateral. The results are again in line with prior analysis, except for IDV, which is no longer statistically significant. More detailed, UAI and ETHICS are negatively and LTO positively associated with a firm pledging a "hard" type of collateral (i.e. non-movables) versus a "soft" type of collateral or no collateral.

[Insert Table 10 Around Here]

4.2.4   Level of collateral

In this section, we explore whether and how cultural and ethical behavior influence the collateral value relate to the loan value (COLVAL). We obtain this information from the answer to the following question in the WBES: "Referring only to this most recent line of credit or loan what was the approximate value of the collateral required as a percentage of the loan value?".

Given that the dependent variable is truncated at zero (left-censored), we estimate a Tobit model, also encountered as censored regression model. Following Hanedar et al. (2014) we perform two alternative estimations. First, we use the full sample. That is, we include in the sample all firms regardless of whether they pledge collateral or not. For firms that do not pledge collateral, COLVAL takes the value of zero. Second, we restrict the sample only to firms that have pledged collateral. We present the results in Table 11. Regardless of the approach that we use we find that: (i) UAI lowers the collateral value, and (ii) LTO increases the collateral value. These findings are consistent with the so far obtained results. When we restrict the sample to firms that have pledged collateral (columns 5-8), INDIV and ETHICAL are also statistically significant. The sign of the coefficient is consistent with the findings of the logit model. In other words, higher INDIV and lower ETHICAL not only enhance the likelihood to pledge collateral but they also increase the value of collateral as percentage of the loan value.

[Insert Table 11 Around Here]

5   Conclusions

Studying the use of collateral is particularly important for at least two reasons. First, collateralized borrowing is widespread across the globe. Second, the use of collateral may amplify and transmit shocks across sectors and countries (Nguyen and Qian, 2012). This paper extends earlier empirical work on the determinants of collateral, by examining for the first time the impact of national culture on the collateral requirements on corporate borrowing. Using a large sample of over 14,000 firms from 70 countries, we investigate not only the presence of collateral but also its type and value.

Controlling for various firm-specific and country-specific attributes considered in earlier studies, we reach three conclusions. First, we support the hypothesis that national culture influences the likelihood to pledge collateral. Second, the results show that culture is an important determinant of whether the companies must pledge movable versus non-movable assets. Third, we find that the value of the collateral (in relation to the value of the loan) is also associated with national culture. However, while we find robust evidence that all the cultural dimensions that we consider are statistically significant when we model the likelihood of collateralized borrowing, not all of them are statistically significant when we consider the type or the value of collateral.

Our study is not without limitations. First, we have no information on the interest rate and the purpose of the loan or on firm financial characteristics. Unfortunately, due to the anonymity of firms in the database of the World Bank's Enterprise Survey it is not possible to collect this information from other sources and match it with our dataset. Second, our analysis is limited to the transition and developing countries covered in the WBES. Thus, it is not possible to examine whether the impact of culture on the use of collateral differs between developed and developing economies or not. We hope that future research will improve upon these issues. Until then, we believe that our analysis provides an interesting insight into the association between informal institutions and collateralized borrowing.

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Table 1: Correlation coefficients of dependent variable and covariates included in (3.2.1)

Table 1: Correlation coefficients of dependent variable and covariates included in (3.2.1)

	Collateral	UAI	IDV	LTO	ETHICS	Age	Managerial Experience	ISO	SMEs	GDP per capita
Collateral	1									
UAI	-0.1215***	1								
IDV	0.013*	-0.1076***	1							
LTO	0.1754***	-0.2943***	0.2524***	1						
ETHICS	-0.0931***	-0.0245***	0.0974***	0.1250***	1					
Age	-0.0785***	0.0953***	0.0223***	-0.1684***	0.0532***	1				
Managerial Experience	-0.0588***	0.1446***	0.0330***	-0.1400***	0.0204***	0.3014***	1			
ISO	-0.0290***	-0.0585***	0.0729***	0.1201***	0.0578***	0.1619***	0.0297***	1		
SMEs	-0.0259***	-0.0545***	-0.1727***	-0.2064***	-0.0079	-0.1835***	-0.0513***	-0.2196***	1	
GDP per capita	-0.1333***	-0.0293***	0.5803***	0.1345***	0.4974***	0.1004***	0.1232***	0.0937***	-0.1315***	1
Depth of Credit	-0.1976***	0.2498***	-0.1802***	-0.4103***	-0.4103***	0.1659***	0.1892***	0.0587***	0.1488***	0.1449***

'Collateral' takes a value of '1' if the firm has pledged collateral to obtain a loan and 0 otherwise. **'UAI'**, **'IDV'** and **'LTO'** refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. **'ETHICS'** denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. **'Age'** is the number of years a firm is in operation. **'Managerial Experience'** shows the years of sector experience the manager of a firm boasts in one's resumé. **'ISO'** is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). **'SMEs'** is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. **'GDP per capita'** is the per capita gross domestic product based on purchasing power parity (PPP). **Depth of Credit'** is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions.

Table 2: Descriptive statistics of variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Collateral	27,700	0.75	0.44	0	1
UAI	20,742	75.20	19.64	13	99
IDV	20,742	29.22	16.59	6	80
LTO	17,481	38.58	22.41	4	100
ETHICS	17,022	3.87	0.69	2.55	6.78
Age	27,579	20.19	18.86	0	309
Managerial Experience	23,922	20.45	11.43	0	70
ISO	27,417	0.25	0.43	0	1
SMEs	27,700	0.64	0.48	0	1
GDP per capita	27,648	7,448.99	7,934.09	307.03	53,561.89
Depth of Credit	25,681	3.72	2.64	0	8

'**Collateral**' takes a value of '1' if the firm has pledged collateral to obtain a loan and 0 otherwise. '**UAI**', '**IDV**' and '**LTO**' refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. '**ETHICS**' denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. '**Age**' is the number of years a firm is in operation. '**Managerial Experience**' shows the years of sector experience the manager of a firm boasts in one's resumé. '**ISO**' is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). '**SMEs**' is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. '**GDP per capita**' is the per capita gross domestic product based on purchasing power parity (PPP). '**Depth of Credit**' is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions.

Table 3: Baseline results of the logistic regression (3.2.1).

VARIABLES	(1) Odds ratios	(2) Odds ratios	(3) Odds ratios	(4) Odds ratios
UAI	0.986***			
	(0.00120)			
IDV		1.003**		
		(0.00149)		
LTO			1.016***	
			(0.00137)	
ETHICS				0.732***
				(0.0241)
Age	0.997***	0.997***	0.997***	0.996***
	(0.000980)	(0.000987)	(0.00106)	(0.00108)
Managerial Experience	1.002	1.001	1.003	1.001
	(0.00161)	(0.00159)	(0.00176)	(0.00170)
ISO	0.966	0.954	0.927	0.932
	(0.0415)	(0.0409)	(0.0434)	(0.0420)
SMEs	0.882***	0.891***	0.880***	0.878***
	(0.0383)	(0.0384)	(0.0418)	(0.0402)
GDP per capita	1.000***	1.000***	1.000***	1.000***
	(2.60e-06)	(3.08e-06)	(2.79e-06)	(3.11e-06)
Depth of Credit	0.882***	0.836***	0.819***	0.849***
	(0.0118)	(0.0104)	(0.0126)	(0.0102)
Observations	16,207	16,207	13,025	15,194
Firms	14,364	14,365	11,518	13,968
Countries	65	65	52	70
Industry Dummies	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
R-squared	0.0496	0.0434	0.0518	0.0554

Results of the Logistic Regression Model described in (3.2.1). Dependent variable, '**Collateral**', takes a value of '1' if the firm has pledged collateral to obtain a loan and 0 otherwise. '**UAI**', '**IDV**' and '**LTO**' refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. '**ETHICS**' denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. '**Age**' is the number of years a firm is in operation. '**Managerial Experience**' shows the years of sector experience the manager of a firm boasts in one's resumé. '**ISO**' is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). '**SMEs**' is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. '**GDP per capita**' is the per capita gross domestic product based on purchasing power parity (PPP). '**Depth of Credit**' is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. Robust standard errors in parentheses, clustered by firm. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. <u>Note</u>: Odds ratios -computed as e^β, where β is the coefficient of a covariate- represent the constant effect of a predictor X, on the likelihood that an outcome (i.e. hereby pledging for collateral) will occur.

Table 4: Enhanced (firm-specific) model results

VARIABLES	(1) Odds ratios	(2) Odds ratios	(3) Odds ratios	(4) Odds ratios
UAI	0.982***			
	(0.00155)			
IDV		1.005***		
		(0.00169)		
LTO			1.016***	
			(0.00152)	
ETHICS				0.781***
				(0.0291)
Age	0.997***	0.997***	0.998*	0.997**
	(0.00123)	(0.00122)	(0.00133)	(0.00123)
Managerial Experience	1.004**	1.003	1.006***	1.003*
	(0.00194)	(0.00192)	(0.00212)	(0.00192)
ISO	1.034	1.002	0.983	0.983
	(0.0519)	(0.0500)	(0.0530)	(0.0494)
SMEs	0.866***	0.870***	0.863***	0.876***
	(0.0451)	(0.0448)	(0.0482)	(0.0449)
GDP per capita	1.000**	1.000***	1.000***	1.000***
	(4.13e-06)	(4.32e-06)	(4.34e-06)	(4.14e-06)
Depth of Credit	0.907***	0.854***	0.822***	0.863***
	(0.0142)	(0.0124)	(0.0155)	(0.0119)
FINOP	0.837***	0.867***	0.838***	0.879***
	(0.0370)	(0.0382)	(0.0426)	(0.0379)
TRCREDIT	1.000	1.000	1.000	0.999
	(0.000640)	(0.000639)	(0.000699)	(0.000632)
FEMALE	1.040	1.037	1.031	1.030
	(0.0462)	(0.0457)	(0.0498)	(0.0452)
Observations	11,336	11,336	9,311	12,239
Firms	10,931	10,931	9,027	12,205
Countries	46	46	35	69
Industry Dummies	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
R-squared	0.0597	0.0504	0.0613	0.0614

Results of the Logistic Regression Model described in (3.2.1), enhanced with additional firm-specific covariates. Dependent variable, '**Collateral**', takes a value of '1' if the firm has pledged collateral to obtain a loan and 0 otherwise. '**UAI**', '**IDV**' and '**LTO**' refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. '**ETHICS**' denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. '**Age**' is the number of years a firm is in operation. '**Managerial Experience**' shows the years of sector experience the manager of a firm boasts in one's resumé. 'ISO' is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). '**SMEs**' is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. '**GDP per capita**' is the per capita gross domestic product based on purchasing power parity (PPP). '**Depth of Credit**' is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. '**FINOP**' is an indicator showing whether the firm has checking or savings accounts and overdraft facility. '**TRCREDIT**' is the percentage of the material inputs or services that were paid after delivery. '**FEMALE**' is a dummy variable that indicates whether there are females among the owners of the firm. Robust standard errors in parentheses, clustered by firm. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. <u>Note</u>: Odds ratios -computed as e^{β}, where β is the coefficient of a covariate- represent the constant effect of a predictor X, on the likelihood that an outcome (i.e. hereby pledging for collateral) will occur.

Table 5: Controlling for bank concentration

VARIABLES	(1) Odds ratios	(2) Odds ratios	(3) Odds ratios	(4) Odds ratios
UAI	0.987***			
	(0.00124)			
IDV		1.004**		
		(0.00156)		
LTO			1.019***	
			(0.00146)	
ETHICS				0.714***
				(0.0234)
Age	0.997***	0.997***	0.997**	0.996***
	(0.00101)	(0.00101)	(0.00109)	(0.00111)
Managerial Experience	1.002	1.001	1.003*	1.001
	(0.00164)	(0.00163)	(0.00180)	(0.00174)
ISO	0.972	0.965	0.947	0.958
	(0.0428)	(0.0425)	(0.0456)	(0.0442)
SMEs	0.885***	0.893**	0.877***	0.873***
	(0.0394)	(0.0395)	(0.0427)	(0.0411)
GDP per capita	1.000***	1.000***	1.000***	1.000***
	(2.69e-06)	(3.20e-06)	(2.92e-06)	(3.08e-06)
Depth of Credit	0.880***	0.838***	0.824***	0.846***
	(0.0119)	(0.0106)	(0.0128)	(0.0104)
CONC	1.000	1.003**	1.010***	1.010***
	(0.00130)	(0.00128)	(0.00154)	(0.00124)
Observations	15,459	15,459	12,524	14,643
Firms	13,753	13,753	11,107	13,494
Countries	46	46	36	67
Industry Dummies	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
R-squared	0.0441	0.0388	0.0520	0.0549

Results of the Logistic Regression Model described in (3.2.1), enhanced to control for the competition levels of the banking sector within the countries that the firms operate in. Dependent variable, '**Collateral**', takes a value of '1' if the firm has pledged collateral to obtain a loan and 0 otherwise. '**UAI**', '**IDV**' and '**LTO**' refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. '**ETHICS**' denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. '**Age**' is the number of years a firm is in operation. '**Managerial Experience**' shows the years of sector experience the manager of a firm boasts in one's resumé. '**ISO**' is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). '**SMEs**' is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. '**GDP per capita**' is the per capita gross domestic product based on purchasing power parity (PPP). '**Depth of Credit**' is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. '**CONC**' is a proxy for market concentration in the banking sector. We use this as a general proxy for competition, with higher figures indicating that only a few banks dominate in the market, and hence there is a lower degree of competition. Robust standard errors in parentheses, clustered by firm. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. <u>Note</u>: Odds ratios -computed as e^{β}, where β is the coefficient of a covariate- represent the constant effect of a predictor X, on the likelihood that an outcome (i.e. hereby pledging for collateral) will occur.

Table 6: Controlling for institutional development

VARIABLES	(1) Odds ratios	(2) Odds ratios	(3) Odds ratios	(4) Odds ratios
UAI	0.986***			
	(0.00125)			
IDV		1.004***		
		(0.00152)		
LTO			1.019***	
			(0.00146)	
ETHICS				0.776***
				(0.0319)
Age	0.997***	0.997***	0.997**	0.996***
	(0.000982)	(0.000987)	(0.00106)	(0.00109)
Managerial Experience	1.002	1.001	1.003*	1.001
	(0.00161)	(0.00160)	(0.00176)	(0.00171)
ISO	0.951	0.939	0.907**	0.926*
	(0.0412)	(0.0406)	(0.0429)	(0.0422)
SMEs	0.876***	0.885***	0.873***	0.877***
	(0.0383)	(0.0383)	(0.0417)	(0.0404)
GDP per capita	1.000***	1.000***	1.000***	1.000***
	(3.51e-06)	(3.66e-06)	(3.58e-06)	(3.65e-06)
Depth of Credit	0.882***	0.834***	0.819***	0.850***
	(0.0119)	(0.0105)	(0.0127)	(0.0102)
INSTIT	0.903**	0.799***	0.751***	0.893**
	(0.0382)	(0.0333)	(0.0353)	(0.0496)
Observations	15,956	15,956	12,774	14,936
Firms	14,114	14,114	11,268	13,712
Countries	46	46	35	68
Industry Dummies	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
R-squared	0.0509	0.0451	0.0533	0.0560

Results of the Logistic Regression Model described in (3.2.1), enhanced to control for the institutional environment within the countries that the firms operate in. Dependent variable, '**Collateral**', takes a value of '1' if the firm has pledged collateral to obtain a loan and 0 otherwise. '**UAI**', '**IDV**' and '**LTO**' refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. '**ETHICS**' denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. '**Age**' is the number of years a firm is in operation. '**Managerial Experience**' shows the years of sector experience the manager of a firm boasts in one's resumé. '**ISO**' is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). '**SMEs**' is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. '**GDP per capita**' is the per capita gross domestic product based on purchasing power parity (PPP). '**Depth of Credit**' is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. '**INSTIT**' is a proxy for institutional development that is constructed as the average of the six governance indicators: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, control of corruption. Robust standard errors in parentheses, clustered by firm. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Note: Odds ratios -computed as e^{β}, where β is the coefficient of a covariate- represent the constant effect of a predictor X, on the likelihood that an outcome (i.e. hereby pledging for collateral) will occur.

Table 7: Baseline model over sub-samples - Excluding the Global Financial Crisis (GFC) period

VARIABLES	(1) Odds ratios	(2) Odds ratios	(3) Odds ratios	(4) Odds ratios
UAI	0.987***			
	(0.00135)			
IDV		1.003**		
		(0.00169)		
LTO			1.019***	
			(0.00160)	
ETHICS				0.752***
				(0.0302)
Age	0.997***	0.997***	0.997**	0.996***
	(0.00110)	(0.00111)	(0.00120)	(0.00126)
Managerial Experience	1.002	1.001	1.003	1.001
	(0.00181)	(0.00179)	(0.00198)	(0.00197)
ISO	0.955	0.941	0.902**	0.921
	(0.0460)	(0.0453)	(0.0475)	(0.0478)
SMEs	0.934	0.943	0.910*	0.920
	(0.0452)	(0.0453)	(0.0484)	(0.0485)
GDP per capita	1.000***	1.000***	1.000***	1.000***
	(2.79e-06)	(3.36e-06)	(3.00e-06)	(3.41e-06)
Depth of Credit	0.892***	0.846***	0.831***	0.848***
	(0.0132)	(0.0117)	(0.0138)	(0.0116)
Observations	12,617	12,617	10,216	11,323
Firms	11,674	11,674	9,413	10,756
Countries	47	47	36	70
Industry Dummies	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
R-squared	0.0472	0.0414	0.0549	0.0589

Results of the Logistic Regression Model described in (3.2.1) excluding the turbulent period of the Global Financial Crisis (GFC), i.e. years 2007-2010. Dependent variable, '**Collateral**', takes a value of '1' if the firm has pledged collateral to obtain a loan and 0 otherwise. '**UAI**', '**IDV**' and '**LTO**' refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. '**ETHICS**' denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. '**Age**' is the number of years a firm is in operation. '**Managerial Experience**' shows the years of sector experience the manager of a firm boasts in one's resumé. '**ISO**' is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). '**SMEs**' is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. '**GDP per capita**' is the per capita gross domestic product based on purchasing power parity (PPP). '**Depth of Credit**' is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. Robust standard errors in parentheses, clustered by firm. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. <u>Note</u>: Odds ratios -computed as e^β, where β is the coefficient of a covariate- represent the constant effect of a predictor X, on the likelihood that an outcome (i.e. hereby pledging for collateral) will occur.

Table 8: Baseline model over sub-samples – SMEs and Large firms

VARIABLES	SMEs				Large			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios	Odds ratios
UAI	0.986***				0.989***			
	(0.00138)				(0.00257)			
IDV		1.003*				1.004		
		(0.00175)				(0.00290)		
LTO			1.015***				1.020***	
			(0.00155)				(0.00298)	
ETHICS				0.773***				0.648***
				(0.0304)				(0.0395)
Age	1.001	1.001	1.001	1.002	0.993***	0.993***	0.994***	0.991***
	(0.00143)	(0.00144)	(0.00154)	(0.00161)	(0.00142)	(0.00142)	(0.00152)	(0.00153)
Managerial Experience	0.999	0.998	1.000	0.998	1.004	1.003	1.005*	1.002
	(0.00199)	(0.00197)	(0.00218)	(0.00210)	(0.00287)	(0.00287)	(0.00312)	(0.00304)
ISO	1.168***	1.153**	1.111*	1.074	0.715***	0.708***	0.696***	0.757***
	(0.0656)	(0.0650)	(0.0674)	(0.0632)	(0.0519)	(0.0513)	(0.0552)	(0.0580)
GDP per capita	1.000***	1.000***	1.000***	1.000***	1.000***	1.000***	1.000***	1.000***
	(2.95e-06)	(3.42e-06)	(3.13e-06)	(3.48e-06)	(6.14e-06)	(7.64e-06)	(6.74e-06)	(7.49e-06)
Depth of Credit	0.880***	0.832***	0.816***	0.844***	0.883***	0.843***	0.823***	0.860***
	(0.0132)	(0.0116)	(0.0142)	(0.0114)	(0.0260)	(0.0230)	(0.0263)	(0.0223)
Observations	11,830	11,830	9,438	11,111	4,377	4,377	3,587	4,083
Firms	10,746	10,746	8,557	10,418	3,895	3,895	3,177	3,729
Countries	47	47	36	70	47	47	36	69
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	0.0476	0.0406	0.0480	0.0497	0.0711	0.0678	0.0778	0.0874

Results of the Logistic Regression Model described in (3.2.1) run over two sub-samples, SMEs (first four columns) and large firms (subsequent columns). Dependent variable, '**Collateral**', takes a value of '1' if the firm has pledged collateral to obtain a loan and 0 otherwise. '**UAI**', '**IDV**' and '**LTO**' refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. '**ETHICS**' denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. '**Age**' is the number of years a firm is in operation. '**Managerial Experience**' shows the years of sector experience the manager of a firm boasts in one's resumé. 'ISO' is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). '**SMEs**' is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. '**GDP per capita**' is the per capita gross domestic product based on purchasing power parity (PPP). '**Depth of Credit**' is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. Robust standard errors in parentheses, clustered by firm. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. <u>Note</u>: Odds ratios -computed as e^{β}, where β is the coefficient of a covariate- represent the constant effect of a predictor X, on the likelihood that an outcome (i.e. hereby pledging for collateral) will occur.

Table 9: Baseline model over sub-samples – Loans granted by private banks

VARIABLES	(1) Odds ratios	(2) Odds ratios	(3) Odds ratios	(4) Odds ratios
UAI	0.986***			
	(0.00138)			
IDV		1.001		
		(0.00168)		
LTO			1.016***	
			(0.00150)	
ETHICS				0.719***
				(0.0256)
Age	0.996***	0.996***	0.996***	0.996***
	(0.00106)	(0.00106)	(0.00114)	(0.00117)
Managerial Experience	1.002	1.001	1.002	1.001
	(0.00172)	(0.00171)	(0.00188)	(0.00183)
ISO	0.958	0.953	0.924	0.925
	(0.0438)	(0.0435)	(0.0459)	(0.0444)
SMEs	0.878***	0.889***	0.876***	0.880***
	(0.0403)	(0.0405)	(0.0440)	(0.0428)
GDP per capita	1.000***	1.000***	1.000***	1.000***
	(2.99e-06)	(3.60e-06)	(3.23e-06)	(3.60e-06)
Depth of Credit	0.862***	0.814***	0.796***	0.814***
	(0.0134)	(0.0117)	(0.0145)	(0.0115)
Observations	13,884	13,884	11,188	13,026
Firms	12,345	12,345	9,904	11,973
Countries	47	47	36	70
Industry Dummies	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES
R-squared	0.0533	0.0471	0.0551	0.0643

Results of the Logistic Regression Model described in (3.3.1) only for loans granted by private banks. Dependent variable, '**Collateral**', takes a value of '1' if the firm has pledged collateral to obtain a loan and 0 otherwise. '**UAI**', '**IDV**' and '**LTO**' refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. '**ETHICS**' denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. '**Age**' is the number of years a firm is in operation. '**Managerial Experience**' shows the years of sector experience the manager of a firm boasts in one's resumé. '**ISO**' is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). '**SMEs**' is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. '**GDP per capita**' is the per capita gross domestic product based on purchasing power parity (PPP). '**Depth of Credit**' is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. Robust standard errors in parentheses, clustered by firm. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. <u>Note</u>: Odds ratios -computed as e^{β}, where β is the coefficient of a covariate- represent the constant effect of a predictor X, on the likelihood that an outcome (i.e. hereby pledging for collateral) will occur.

Table 10: Continuation Ratio Model regarding the type of collateral pledged by the firm

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	Logit 1	Logit 2	Logit 1	Logit 2	Logit 1	Logit 2	Logit 1	Logit 2
UAI	0.988***	0.992***						
	(0.00142)	(0.00109)						
IDV			1.004**	1.001				
			(0.00175)	(0.00140)				
LTO					1.005***	1.024***		
					(0.00170)	(0.00126)		
ETHICS							0.736***	0.847***
							(0.0283)	(0.0263)
Age	0.996***	1.000	0.996***	1.000	0.996***	1.001	0.994***	1.000
	(0.00113)	(0.000949)	(0.00113)	(0.000949)	(0.00121)	(0.00107)	(0.00127)	(0.00101)
Managerial Experience	1.000	1.004***	0.999	1.003**	1.001	1.004**	0.999	1.003*
	(0.00185)	(0.00151)	(0.00184)	(0.00151)	(0.00203)	(0.00175)	(0.00198)	(0.00156)
ISO	0.877**	1.125***	0.869***	1.117***	0.886**	1.038	0.864***	1.076*
	(0.0453)	(0.0456)	(0.0449)	(0.0453)	(0.0492)	(0.0476)	(0.0470)	(0.0443)
SMEs	0.995	0.782***	1.001	0.786***	1.005	0.775***	0.990	0.785***
	(0.0526)	(0.0317)	(0.0527)	(0.0318)	(0.0578)	(0.0361)	(0.0560)	(0.0327)
GDP per capita	1.000***	1.000***	1.000***	1.000***	1.000*	1.000***	1.000	1.000***
	(2.95e-06)	(2.67e-06)	(3.53e-06)	(3.20e-06)	(3.26e-06)	(3.31e-06)	(3.58e-06)	(3.18e-06)
Depth of Credit	0.897***	0.945***	0.853***	0.916***	0.848***	0.874***	0.862***	0.940***
	(0.0133)	(0.00971)	(0.0114)	(0.00850)	(0.0150)	(0.0105)	(0.0108)	(0.00794)
Observations	16,207	16,207	16,207	16,207	13,025	13,025	15,194	15,194
Firms	14,364	14,364	14,364	14,364	11,518	11,518	13,968	13,968
Countries	65	65	65	65	52	52	70	70
Year Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES
R-squared	0.0344	0.0344	0.0312	0.0312	0.0484	0.0484	0.0379	0.0379

Results of the Continuation-Ratio Model. Dependent variable, takes a value of '0' if the firm has not pledged any collateral, '1' if the firm has pledged collateral of type 'movables' and '2' of type 'non-movables'. '**UAI**', '**IDV**' and '**LTO**' refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. '**ETHICS**' denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. '**Age**' is the number of years a firm is in operation. '**Managerial Experience**' shows the years of sector experience the manager of a firm boasts in one's resumé. '**ISO**' is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). '**SMEs**' is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. '**GDP per capita**' is the per capita gross domestic product based on purchasing power parity (PPP). '**Depth of Credit**' is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. Robust standard errors in parentheses, clustered by firm. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. <u>Note</u>: Odds ratios -computed as e^β, where β is the coefficient of a covariate- represent the constant effect of a predictor X, on the likelihood that an outcome (i.e. hereby pledging for collateral) will occur.

Table 11: Tobit Model regarding the level of collateral pledged by the firm

VARIABLES	Collateral value % (full sample - FS)				Collateral value % (firms pledged collateral - PC)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	FS	FS	FS	FS	PC	PC	PC	PC
UAI	-0.782***				-0.683***			
	(0.0988)				(0.0714)			
IDV		-0.116				1.267***		
		(0.134)				(0.105)		
LTO			0.587***				0.426***	
			(0.175)				(0.120)	
ETHICS				2.038				-25.07***
				(7.228)				(6.566)
Age	-0.0120	-0.0593	-0.0499	-0.0217	0.0208	-0.0435	0.0941	0.468**
	(0.108)	(0.108)	(0.127)	(0.248)	(0.0748)	(0.0737)	(0.0851)	(0.212)
Managerial Experience	0.262	0.254	0.431*	0.288	0.765***	0.770***	0.942***	0.152
	(0.196)	(0.196)	(0.241)	(0.399)	(0.155)	(0.154)	(0.187)	(0.317)
ISO	-23.78***	-18.92***	-26.29***	-18.00	-14.3***	-12.04***	-13.34***	-6.537
	(4.488)	(4.415)	(5.164)	(11.69)	(3.161)	(3.128)	(3.599)	(9.099)
SMEs	-21.38***	-24.17***	-26.20***	-6.638	7.197*	11.00***	8.618*	15.30*
	(5.431)	(5.474)	(6.712)	(11.09)	(4.158)	(4.231)	(4.976)	(8.753)
GDP per capita	-0.01***	-0.009***	-0.01***	-0.01***	-0.000243	-0.00355***	-0.00188***	0.00134
	(0.00069)	(0.000678)	(0.00077)	(0.00155)	(0.0005)	(0.0005)	(0.000586)	(0.0014)
Depth of Credit	9.621***	5.674***	8.137***	18.70***	0.756	-3.191***	-1.261	-9.726*
	(1.199)	(1.144)	(1.628)	(3.394)	(0.955)	(0.920)	(1.291)	(5.072)
Observations	10,814	10,814	9,139	7,084	3,741	3,741	2,881	927
Firms	6,604	6,604	5,474	4,844	2,145	2,145	1,569	870
Countries	47	47	36	69	12	12	8	14
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Time dummies	YES	YES	YES	YES	YES	YES	YES	YES

Results of the Tobit Model (left-censored at 0). First four columns (denoted 'FS') refer to results of the full sample, where firms not pledging collateral receive a value of '0'. Subsequent four columns (denoted 'PC') is a sub-sample only regarding firms that have pledged collateral. Dependent variable shows the value of collateral as % of the firm's size. '**UAI**', '**IDV**' and '**LTO**' refer to the three cultural dimensions of the Hofstede model, namely uncertainty avoidance, individualism and long-term orientation. '**ETHICS**' denotes the WEF's survey on leaders' views on how ethical corporations behave in a country. '**Age**' is the number of years a firm is in operation. '**Managerial Experience**' shows the years of sector experience the manager of a firm boasts in one's resumé. '**ISO**' is a dummy variable on whether a firm has internationally-recognized quality certification (e.g. ISO 9000, ISO 9002). '**SMEs**' is a dummy variable that takes the value of '1' whether a firm is an SME and '0' when it is considered large. '**GDP per capita**' is the per capita gross domestic product based on purchasing power parity (PPP). '**Depth of Credit**' is an index where higher values indicate the availability of more credit information, from either a public registry or a private bureau, to facilitate lending decisions. Robust standard errors in parentheses, clustered by firm. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.