LINKING NATIONAL CULTURE TO FIRM DEFAULT RISK: INTERNATIONAL EVIDENCE

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ABSTRACT

This paper investigates whether national culture influences the default risk level of firms and if so, what cultural dimensions affect most firm default risk. Understanding the sources of firm default risk and its variation is crucial for developing robust risk models at the global level. In order to examine the influence of national culture − measured by Hofstede's index − on default risk, this study employs multivariate regressions and principle component analysis (PCA) methods. The preliminary results suggest that firms' aggregate default risk level differs among countries, and that a significant relationship exists between national culture and firm default risk. The PCA results reveal that power distance and uncertainty avoidance could be related to one dimension as they both have similar signs and in the same direction. Individualism appears to have an inverse relationship with power distance and uncertainty avoidance. The study may be of particular value for the different stakeholders interested in the survival of a firm. The addition of national cultural dimensions allow to capture values and behaviors of managers and stakeholders.

Keywords: National culture - Firm default risk - Credit ratings - Institutional environment

1 - INTRODUCTION

Default risk is defined as the uncertainty surrounding a firm's ability to service its debts and obligations. The notable recognition of default risk as an indicator for firms' financial health and the economic and social consequences of bankruptcies highlights the importance of default risk as a research subject per se, which has been examined fairly in the literature. Despite the massive efforts to rescue the brand, on Monday 23rd of September 2019, "Thomas Cook", the oldest travel agency on the planet – which was created in 1841 – announced that it is in the process of asset liquidation and filed for bankruptcy. This default has accounted a loss of 1.5 billion GBP (Pound Sterling), leaving hundred thousands of tourists stranded around the world, and cutting 21,000 jobs [1]. The company management invoked cyclical circumstances (e.g. Brexit, competition, climate issues) to explain the firm collapse. Even though these reasons are not trivial, the company

has previously witnessed several missteps related to management issues and managerial decisions (e.g. the merge with MyTravel in 2007, the merge with Co-operative Travel in 2010). The inability of the company management in rectifying its long-term strategy (i.e. the merge decision) could be related to the British managerial culture which is characterized more by short-term planning – based on Hofstede's national culture dimensions, beside other factors that led the company to its doom. In this article, we address the culture *per se*, as national culture has a great impact on managers' way of thinking. Recent research attempts to link national culture with capital structure and financing decisions, as choices of capital structure influence the default risk level. That is, a variation in national culture would lead to a variation in managers' decisions. Nonetheless, this is not the first corporate failure, nor the last. For instance, by the end of December 2016, the world had experienced a corporate failure for 162 corporations – rated by S&P – which is the highest default after the 2008-2009 financial crisis, according to the 2016 annual report of S&P (Vazza and Kraemer, 2017). This failure has been accounted for $239.8 billion in debt, which is also more than double the amount in 2015 (the total was $110.3 billion). At a global level, the increasing trend in business insolvencies continued in 2018 (+10%), in addition to a drop in economic growth (Hermes, 2019).

In spite of the substantial accumulation and discovers of theoretical inconsistencies on default risk, the rapid changes in the surrounding environment assert the need for additional research on this latter. The extensive work on default risk stems from the work of Altman (1968), Merton (1974), and Ohlson (1980). Following that, different studies were carried out comparing these models (Das et al., 2009; Hillegeist et al., 2004; Schenck, 2014), other proposing reduced-form and hazard-rate models (Byström, 2006; Byström and Kwon, 2007; Chava and Jarrow, 2004). Additional studies examine the accuracy of credit ratings developed by different raters (Hilscher and Wilson, 2016; Kazemi and Mosleh, 2012). Another stream of literature attempts mainly to examine the impact of macroeconomic factors on the bankruptcy level. Chava and Jarrow (2004) demonstrate the importance of industry in bankruptcy prediction. Chen (2010) shows how macroeconomic conditions can influence default triggers. Li (2013) states that the occurrence of bankruptcy depends on macroeconomic conditions and proposes a structural model of default under macroeconomic conditions. Aretz and Pope (2013) examine the importance of industry, country, and global effects for changes in firms' default risk. The authors differentiate between global and country effects and state that country effects could dominate changes in default risk. Schwaab et al. (2017) investigate the properties of default risk conditions across countries and find that macro and default-specific factors are a primary source of bankruptcy clustering.

Given that the financial situation of the firm itself does not solely rely on micro-factors, but rather, on macro-factors as well, firms would be more prone to default if these factors are not in their favor. This raises the importance of questioning what other factors could be related to financial risk. That is, what factors could influence the default risk determinants. Besides the stream of literature that examines the impact of macroeconomic factors on financial risk, some recent studies question the influence of national culture on this latter. Li et al. (2013) examine the impact of national culture of risk-taking and significant impact. Similarly, Kanagaretnam et al. (2014) examine the impact of national

culture – measured by individualism and uncertainty avoidance – on risk-taking in the banking industry. The authors find cultures that encourage risk-taking would experience more bank failures during a financial crisis.

The relationship between national culture and firm default risk has hitherto been a much-neglected topic that is vital to advance our interdisciplinary understanding of firms' bankruptcy. Hofstede defined four cultural dimensions in his early research, namely: power distance, uncertainty avoidance, individualism, and masculinity, which have been widely used in research as a proxy for national culture. Given that cultural differences are one of the critical challenges for firms to achieve potential success, we attempt to investigate how national culture could be related to default risk and examine empirically the impact of national culture on firm default risk.

The institutional theory states that institutional contexts have an impact on the rules and understandings by which organizations operate (Kim et al., 2013; Morgan and Kristensen, 2006). The existing theory has generated valuable insights into the process of defining and explaining how institutional environments influence the organizational adoption of homogeneous practices (Yin, 2017). Scott (2008) differentiates between three components in the institutional environment: regulative, normative, and cultural-cognitive. An individual will follow the rules to avoid punishment, comply with norms by moral obligation, and act according to his beliefs because he cannot conceive of doing otherwise. The regulatory dimension has been studied more in academic studies, even if, according to Scott (2008), cultural cognitive frameworks provide the deepest foundations of institutional forms. Thus, we propose to include the impact of the institutional environment on default risk by observing the role of national culture. Is there a relationship between national culture and firm default risk? If so, which dimensions matter?

Based on the aforementioned theory, and given that default risk is closely related to the financial performance of the firm, this research sheds light on examining how national culture influences corporate financial performance (CFP), what are the factors that might trigger the default risk level inside firms, and empirically examines the impact of national culture on default risk. We consider Hofstede's cultural dimensions to address national culture. To assess the firms' default risk level, we consider credit ratings as a default risk proxy. We include several control variables at the micro and macro level, in order to isolate any possible influence on the examined relationship. Further details are discussed in the data section. The overall results indicate a significant relationship between national culture and firm default risk. These results hold after implementing other analyses as robustness tests. Moreover, using the PCA method, we find that power distance and uncertainty avoidance follow the same sign and direction, contrary to individualism.

Understanding the sources of firms' bankruptcy risk and its variation is crucial for developing robust risk models at the global level. Our research contributes to the literature on default risk by being the first to empirically investigate the impact of national culture on firms' default risk. The objective of this article is in line with scholars' call to focus on studies concerning risk indicators and drivers (Kanagaretnam et al., 2014; Kaplan, 2011). In considering

national culture as a driver of firm default risk, we improve the explanatory models of default risk, adding to economic and monetary variables individual beliefs and behaviors not rationally explained and not universal. We expect the cultural dimensions to capture the values and psychology of the firms' stakeholders, for instance spirit of competition, risk-taking, altruism, and overconfidence bias.

The rest of the paper proceeds as follows: Section 2 lays out the literature review and hypotheses development. Section 3 describes the data and empirical methodology. Section 4 reports the descriptive statistics, empirical results, and robustness test. Section 5 concludes the paper.

2 - LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Does culture matter? As recent research attempts to come to grips with the relationship between human values and business in general, there has been a mounting recognition in how cross-national differences could be related to this latter. While researchers recognize the importance of culture in determining firms' policies and decisions, not much has been done to empirically test the nature of the relationship between culture and CFP. In this study, we attempt to explain the link between national culture and firm default risk.

Culture is recognized as a determinant for the difference among individuals from different backgrounds, which is true as well for the organizations (Ho et al., 2012; Hofstede, 1985). Hofstede's early research found four dimensions to explain cultural differences. Following that, much work in this field has been conducted, and different cultural measures have been developed [2]. The recognized importance for the Hofstede index in the literature represents the motivation to consider this index as a measure for national culture in our study.

A central question before conducting this research is whether countries' average default risk – measured by the credit ratings – differ among countries. For instance, does the aggregate firm default risk in France differs from that in the U.S.? If so, does national culture influence firms' default risk level? Scholars indicate the importance of the institutional environment in shaping firms' practices and success. Therefore, firms would be affected by their surrounding environment, in a way or another. Indeed, the macro factors affecting firms' CFP are not solely related to the economic situation of the country. The rest of the paper is subject to this condition, which we address first in our methodology. If no difference exists between countries' average bankruptcy probability, it would be illogical to examine the impact of national culture on firms' default risk. In light of this, we expect first to observe a variation in firms' average credit ratings – our default risk measure – based on their corresponding countries, and we hypothesize the following:

H1: Aggregate average firms' default risk varies between countries.

By definition, power distance is the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally (Hofstede et al., 2010). As national culture has a great impact on managers' way of thinking, a variation in national culture would lead to a variation in these decisions. Recent research attempts to link power

distance with capital structure and financing decisions, as choices of capital structure influence the default risk level. For instance, Haq et al. (2018) find that banks operating in countries that enjoy a high level of power distance tend to prefer more equity in financing decisions. Scholars find that firms in countries with greater power distance would tend to prefer market financing (Aggarwal and Goodell, 2010; Arosa et al., 2014; Kwok and Tadesse, 2006). Besides, the literature on default risk indicates a positive relationship between leverage and default risk (Vassalou and Xing, 2004), and scholars identify leverage as a main determinant for default risk (Altman, 1968; Hillegeist et al., 2004; Merton, 1974). Arosa et al. (2014) find that firms in countries with high power distance have lower market leverage ratios. Therefore, we expect that firms operating in countries with high power distance would have a lower default risk level, and we hypothesize the following:

H2: A higher level of power distance decreases the default risk level.

Uncertainty avoidance measures how society deals with uncertainty and how society members accept ambiguous situations (Gallén and Peraita, 2018; Liang and Renneboog, 2017). Hofstede et al. (2010) define uncertainty avoidance as the extent to which a member of society feels threatened by unknown or ambiguous situations. Individuals living in countries with high uncertainty avoidance tend to prefer more strict laws, rules, and plans, to avoid uncertainty (Ho et al., 2012). Furthermore, having more strict laws will encourage firms to behave in a good manner (e.g. toward the society), which will decrease the possibility of facing lawsuits, and develop a good reputation for the firm itself. This moral capital will have a positive impact on firms' financial performance. A more direct link can be seen with the ratio of leverage. Scholars find that firms in countries with lower uncertainty avoidance would tend to prefer bank financing over market financing (Aggarwal and Goodell, 2010; Kwok and Tadesse, 2006). Li et al. (2013) identify a negative association between uncertainty avoidance and risk-taking. Arosa et al. (2014) find that firms in countries that have high uncertainty avoidance level exhibit lower leverage ratios, where this latter is as indicated before, positively related to default risk. The authors explain further by stating that managers in high uncertainty avoidance cultures show an offensive attitude toward debt financing. Therefore, we hypothesize the following:

H3: A higher level of uncertainty avoidance decreases the default risk level.

Hofstede's Individualism is the extent to which people in a society are integrated into groups (Gallén and Peraita, 2018). In individualistic societies, people focus on themselves and their immediate family, whilst in collectivist societies people have a higher desire to belong to groups, which is similar to societies that give a higher interest for stakeholders. Therefore, individuals who are high on individualism will prefer their personal interests over the group interest. For instance, managers will tend to act more in their personal favor by having big offices, new cars, etc. Consequently, this will increase the costs of the company which might result in a decrease in the liquidity level. Moreover, Breuer, Riesener, & Salzmann (2014) find that individualism, with its link to overconfidence and over-optimism, has a positive impact on financial risk-taking. Similar results are obtained by Li et al. (2013). In line with this, we hypothesize that:

H4: A higher level of individualism increases the default risk level.

Hofstede's Masculinity index stands for the roles determined culturally and socially. That is, it is not a biological gender difference. More precisely, it represents a preference for heroism, material success, assertiveness, and achievement (Hofstede, 1985). A high score of masculinity indicates that the society is driven by competition, achievement, and success, while a low score stands for a feminine society that considers the quality of life and caring about others as the sign of success. The prior literature states that masculine individuals value competition and financial gain. The masculinity character consists of having the spirit of competition and achievement. It is argued that managers from high masculine cultures show more efforts and assertive behavior towards organizational wealth. Therefore, we argue that Hofstede's masculinity measure is negatively related to default risk and we hypothesize the following:
H5: A higher level of masculinity decreases the default risk level.

3 - DATA AND EMPIRICAL TESTS

3.1. Data:

The proxy for national culture dimensions is available from Hofstede's website. The credit ratings considered in this study are the Standard and Poor's credit ratings which are gathered from the Compustat-Capital IQ database. The financial data considered for the micro-factors are extracted from CRSP. The common element between Compustat-Capital IQ and CRSP is the GVKEY. The WRDS database offers a linking table based on GVKEY and different conditions (LC, LU, and LS) in order to ensure accurate matching. We consider this matching methodology. After matching both databases, we obtain 14392 observations covering 3627 corporations distributed over 55 countries during the period 1990-2018. Because high leverage more likely indicates default, we exclude financial firms since high leverage that is normal for these firms does not have the same meaning for nonfinancial firms. We remove observations of unrated firms from the sample. To ensure that our examined relationship is not influenced by other country-level factors, we include macro-factors that are extracted from The World Bank – World Development Indicators. All data are in US dollars. After merging Hofstede's cultural dimensions with the aforementioned databases and removing observations with incomplete data, our final sample consists of 9767 observations covering 2621 firms distributed over 24 countries during the period 1991-2018.

3.2. Measuring firm default risk and national culture:

Credit rating agencies assign bond ratings for various issuers in the form of a letter grade scales. These ratings aim to evaluate the creditworthiness of firms, based on their financial history, standing assets and liabilities, and to the extent they are able to meet their debt obligations. In this paper, we make use of Standards & Poor's credit ratings as a proxy for default risk. These ratings are extracted from the Compustat-Capital IQ database in the form of letters and transformed into numerical values. These ratings consist of different categories: the first corresponds to non-rated firms (NR), whilst the second consists of rated firms (Sun

and Cui, 2014). The second category considered in this study ranges from AAA (23) to D (2), for AAA standing for the lowest default risk, while D stands for the highest. In our model, an increase in the number (2-23) means a decrease in default risk.

As a proxy for national culture, we consider the four cultural dimensions presented by Hofstede, namely: Uncertainty Avoidance (*UA*), Power Distance (*PD*), Individualism (*IDV*), and Masculinity (*MAS*).

3.3. Control variables

In order to eliminate other factors that might influence the examined relationship, we adopt different control variables, which we divide into two different groups: first, variables concerning the state of firms under examination, which we refer to by "*micro-factors*"; second, variables concerning the state of the economy that the firm belongs to, and we refer to by "*macro-factors"*.

Scholars point to the importance of size in assessing bankruptcy, and state that large firms are more diversified and would realize a lower default probability. Therefore, we consider the logarithm of total assets as a measure for size (*SIZE*), and we expect a positive relationship with credit ratings. In general, profitability and liquidity ratios are prevailed to be significant indicators for distress. We consider the return on assets as a measure for profitability (*PROF*). Another potential indicator of bankruptcy is liquidity (Altman, 1968). Following Altman (1968), we consider the ratio of working capital to total assets as a liquidity (*LIQ*) measure, which has been proved in the literature as the most valuable. We expect these indicators to be positively related to credit ratings. Besides, leverage (*LEV*) stands as an important indicator that cannot be neglected. We consider the ratio of long-term debt to total assets as a measure of leverage. Since a higher level of leverage increases the probability of default, we expect *LEV* to be negatively related to credit ratings. The aforementioned variables represent the "*micro-factors*".

To isolate the impact of culture on credit ratings we need to control for the other macro-factors that might have an effect on the average country default risk. Consistent with the prior literature and following Cao et al. (2019), Schwaab et al. (2017), and Aretz and Pope (2013), we control for macroeconomic factors that could affect firms' default risk level. Using the annual growth of GDP, we control for the economic cycle in a given country. For instance, a company during an economic growth period would not give the same financial output as in an economic recession period. Even if we assume that the firm itself is able to survive during a recession or financial crisis period, we must take into consideration the different stakeholders (e.g. customers) that might be affected, and consequently, might affect the firm. We expect this variable to be positively related to credit ratings, where better economic cycles (i.e. growth periods) provide a better financial environment for corporations. In addition, we control for Inflation (*INF*) using the consumer price inflation rate (transformed) [3], which is expected to be negatively related to credit ratings. Given the significant cost imposed by unemployment on the society and the state, and the positive correlation between unemployment and credit risk as indicated by scholars, we consider the level of

unemployment (*UNEMP*) in the control variables, which we expect to be negatively related to credit ratings. The aforementioned variables represent "*macro-factors*".

The literature on default risk points to the importance of sector while analyzing firms' default risk level, since some sectors would have high uncertainties and higher levels of debt with respect to others. Therefore, we control for sectors based on the four-digit GICS classification. We include time fixed effects in our models.

3.4. Methodology

We consider default risk as our dependent variable; the cultural dimensions are variables of interest, and we include the control variables as additional explanatory variables. Equation (1) represents the empirical model considered in this study, which examines each cultural dimension separately in order to avoid any possible effect of multicollinearity among the independent variables.

$$\begin{aligned} CR_{it} = \alpha + \beta_1 \times CULTURE_{it} + \beta_2 \times SIZE_{it} + \beta_3 \times PROF_{it} \\ + \beta_4 \times LIQ_{it} + \beta_5 \times LEV_{it} + \beta_6 \times G\_GDP_{it} \\ + \beta_7 \times INF_{it} + \beta_8 \times UNEMP_{it} + \sum_K \beta_K \times GICS_k \\ + \sum_J \beta_J \times YEAR_j + \varepsilon_{it} \end{aligned} \quad (1)$$

Where CR_{it} is the proxy of firm default risk measured by credit ratings; α represents the intercept; $CULTURE$ stands for the cultural dimensions presented in the Hofstede study that is being examined and replaced respectively by $PD, UA, IDV, and\ MAS$ in different regressions; $SIZE_{it}$ is the logarithm of total assets; $PROF_{it}$ is the return on assets; LIQ_{it} is the ratio of working capital to total assets; LEV_{it} is the ratio of long-term debt to total assets; G_GDP_{it} is the annual growth of GDP; INF_{it} are the transformed consumer inflation rates; $UNEMP_{it}$ is the unemployment rate; $GICS_k$ is to control for sectors based on their four-digit GICS code; $YEAR_J$ is the time fixed effect included in the model; ε_{it} is the respective disturbance term. All the variables refer to firm i at time t.

4 - EMPIRICAL RESULTS AND DESCRIPTIVE STATISTICS

4.1. Descriptive statistics

This section reports the descriptive statistics, the Pearson correlation test, and the variance inflection factor for credit ratings, Hofstede's cultural dimensions, and the control variables.

Table 1: Descriptive statistics for the regression variables

Table 1 (available at the end of the paper) reports the descriptive statistics for the regression variables, having a total number of observations 9767 covering 2621 firms distributed over 24 different countries over the period 1991-2018. On average, credit ratings have a value of 11.96, a median of 12, and the data values

range between 2 and 23. This shows how the sample is distributed among different firms, those with high default risk (i.e. low credit ratings), and those with low default risk (i.e. high credit ratings), which is important in our analysis. In addition, Hofstede's cultural dimensions range from 5 to 95, indicating a clear variation in cultural dimensions between the countries under study. The average of the "*micro-factors*" control variables are 3.41, 0.08, 0.1, and 0.36 for $SIZE, PROF, LIQ,$ and LEV respectively. These results indicate that diversity in our sample includes big firms, profitable, liquid, and leveraged firms as well.

Table 2: The Pearson pairwise correlation coefficients between the variables

Table 2 reports the Pearson correlation coefficients for the regression variables. The correlation between the dependent variable (i.e. credit ratings) and the independent variables of interest (i.e. the cultural dimensions) are in line with the aforementioned hypotheses. Based on Pearson's pairwise correlation test, all the control variables are significantly related to the dependent variable (at least, at the 5%). Concerning the cultural variables, there is a clear high correlation between the variables (as expected), and this is why we address each of these variables in different regressions. For instance, there is a high correlation between uncertainty avoidance and power distance (0.84), individualism is negatively correlated to uncertainty avoidance and power distance (−0.89 and −0.87, respectively), and masculinity is more correlated with individualism than with power distance and uncertainty avoidance.

For the sake of explaining, we perform a principal component analysis (PCA) concerning the cultural dimensions. Given that the number of cultural dimensions is rather small, we rely in our main analyses on all the variables presented by Hofstede, whilst the PCA is included just to determine the significance of these dimensions. Figure (1) presents the graphical representation of the developed components. As shown in the figure, and on a two-dimensional representation, we can observe how power distance and uncertainty avoidance are almost belonging to the same component, which supports the Pearson correlation results concerning the correlation between both variables. This convergence could be seen clearly in how scholars address these two dimensions solely, in most studies, when examining their impact on financial decisions. Also, the aforementioned variables are on the opposite of individualism. Therefore, we can refer to the three variables by the one dimension presented in Figure (1). Meanwhile, masculinity is almost between the previous three variables, which we can refer to it by a second dimension (i.e. the vertical one). Furthermore, we consider the PCA dimensions as a proxy for national culture in the robustness section as a second approach to examine the relationship between national culture and default risk.

Figure 1: Principle component analysis concerning Hofstede's cultural dimensions

In the robustness section, we make use of the developed components (dimensions) to examine the impact of the cultural variables on default risk. This carried analysis could not justify the significant impact of each variable *per se*. Given that we have two groups for three opposing dimensions in one component (i.e. individualism, power distance, and uncertainty avoidance), the sign of the coefficient would be useless. Rather, we rely on the significance level just to identify if there is any

significant impact of these components on default risk. In our main analysis, we consider Hofstede's national culture dimensions (i.e. not the developed components) separately, so that the model does not contain issues related to multicollinearity. Furthermore, we calculate the variance inflation factor (VIF) for the regressed variables The mean VIF has a value of 1.15, indicating that there is almost no multicollinearity between the explanatory variables.

4.2. Empirical results

In order to examine H1, we exclude financial firms and unrated firms, and we employ an ANOVA test of means to check whether firms' aggregate default risk – based on the countries under study – differs among different countries. Table 3 reports the list of countries with their corresponding average.

Table 3: Aggregate firm default risk average per country

In the ANOVA test, the null hypothesis is that all means are equal. If the p-value is significantly lower than 5%, we reject the null hypothesis and H1 is validated. The obtained result is significant with a p-value of less than 1%. Therefore, we reject the null hypothesis and H1 is validated indicating that the aggregate default risk of firms operating in different countries significantly varies. In line with our expectation, we meet the main condition in this study for the existence of a difference between default risk levels among countries, which enables us to proceed in examining the rest of the hypotheses.

Table 4 reports the obtained results after regressing credit ratings (*CR*) – our default risk measure – over Hofstede's cultural dimensions and the control variables.

Table 4: Examining the impact of national culture on firm default risk

The results reveal that all of the cultural variables considered in this study are significantly related to firm default risk (at least, at the 5% level), in line with our expectations, that national culture influences the default risk level inside the firm. Power distance (*PD*) is positively and significantly related to credit ratings, indicating that a higher power distance will decrease firm default risk, which validates H2. Uncertainty avoidance (*UA*) is positively and significantly related to credit ratings, indicating that a high level of uncertainty avoidance will decrease firm default risk, which is consistent with H3. Individualism (*IDV*) is negatively and significantly related to credit ratings, indicating that a higher level of individualism increases firm default risk, which validates H4. Masculinity (*MAS*) is positively and significantly related to credit ratings, indicating that a higher level of masculinity decreases firm default risk, which therefore validates H5. Therefore, the overall results reveal the importance of culture in influencing the level of default risk inside corporations.

The significance of the obtained results could be more explained in their managerial patterns – that is, the managerial psychology. Going back to the "Thomas Cook" example, the major reasons for this default has mainly started in the merge decisions made by the company. These decisions were the outcome of how the board of managers believed their decision would help their company. Although several factors have led to this default, our intention in this paper was to

address the cultural framework per se, for what this framework could even serve in explaining the managerial patterns followed and influenced by the national culture, and affecting the management quality. The link between management and default risk has already been pointed out in the prior literature, for which management inadequacies could influence the default risk level for firms (Altman and Hotchkiss, 2006). The aforementioned analyses address this issue and explain empirically the relationship between national culture and default risk. Power distance appears and uncertainty avoidance appears to have a similar influence on default risk, which has been recognized previously that countries tend to score similarly on these dimensions. Meanwhile, individualism is in the opposite of these dimensions, which is expected because individualism stands to the way people are integrated into groups, whilst power distance, for instance, stands for the power distribution in accordance with the hierarchy. Besides, the presence of high masculinity in the managerial pattern of managers shows the spirit of competition and achievements, which are necessary to sustain good management.

4.3. Robustness test

In order to ensure the robustness of our results and the validity of our hypotheses, we employ different models. Using the PCA loadings obtained previously, we consider the first two dimensions – which account for 81.8% of the information in Hofstede's dimensions (i.e. *Dim1* and *Dim2*). These dimensions are considered in equation (1) as a national culture proxy. We expect a positive relationship between *Dim1* and default risk, as this dimension is more related to masculinity. On the other hand, we cannot specify the type of the relationship (i.e. negative vs positive) between *Dim2* and default risk, as the loadings of the components of this dimension are related to opposite variables (i.e. power distance and uncertainty avoidance on the one hand, and individualism on the other). Nevertheless, this method allows us to indicate whether a significant relationship exists between national culture and default risk. Table (5) reports the obtained results, which confirm a significant relationship concerning the aforementioned relationship.

Table 5: Examination within PCA dimensions

Furthermore, we examine whether our findings hold after using different control variables at the firm level. Following the outstanding literature on default risk, we include/replace additional control variables that might influence the default risk level. We follow Ohlson (1980) to control for the impact of leverage (*TL_TA*) on default risk as the ratio of total liabilities to total assets, instead of our long-term debt to total assets. To recognize the difference between long-term and short-term profitability, we include the ratio of retained earnings to total assets (*RE_TA*) as an additional measure for profitability that accounts for long-term profitability. Molina (2005) states that tangibility serves to guarantee debt. Therefore, we control for tangibility (*TANG*) as the ratio of net property plant and equipment to total assets. We add another variable to account for liquidity through following prior studies by considering the quick ratio (*QR*) defined as the ratio of total current assets to total current liabilities. We consider these variables in the initial model presented in equation (1). Table 6 reports the results, which are in line with our previous results in the main analyses. Therefore, our main findings are robust even after controlling for different/additional firm-level factors.

Table 6: Examining the impact of national culture on firm default risk with alternative control variables

As our analyses were carried after excluding financial firms from the sample under study, we consider a wider sample by including financial firms in our study. The considered model is the one presented in Equation (1) in our main analyses [4]. The results confirm our hypotheses. As an additional analysis, we reexamine the initial model on two stages: first, we regress the dependent variable over the control variables (i.e. micro and macro) to isolate the possible factors influencing the impact of national culture on default risk; second, we make use of the obtained residuals and regress them over the variables of interest (i.e. the cultural variables). The obtained results confirm our previous findings [5].

5 - CONCLUSION

Despite the contributions of the literature to a better understanding of firms' default risk, the mechanisms that lead to bankruptcy are still to be explored. The first determinants of a firm's default risk are in the firm itself: how is the firm able to use financial and human capital to survive? The financial indicators (profitability, liquidity, leverage) are the reflection of this ability. However, a firm is operating in an environment that impacts its performance and survival. This environment can be captured by the characteristics of the country: infrastructures, wealth level, education level, financial markets maturity, regulations, political stability… We have used macroeconomic variables to represent the economic environment but it is not enough: there are subjective, irrational, psychological factors difficult to measure but having an impact on the firms' life and death. We have proposed to consider these elements through the national culture and the dimensions highlighted by Hofstede. We expect the cultural dimensions to capture the values and psychology of the firms' stakeholders. In particular, the national cultural dimensions permit to condense managers' mind and behavior that cannot be measured by financial or macroeconomic variables: the spirit of competition, ambiguity aversion, risk-taking, altruism, overconfidence bias, etc. Our primary research question is whether firms operating in different countries exhibit on average different default risk levels. If so, does national culture matter? This paper stresses the role of national culture in influencing the firm default risk level, by examining empirically the impact of national culture − measured by Hofstede's national culture index − on firms' default risk − measured by credit ratings. The overall results suggest that firms' aggregate default risk, based on their corresponding country, differ among countries. Besides, national culture appears to have a significant impact on firm default risk. Power distance, uncertainty avoidance, and masculinity appear to have a negative impact on default risk, whilst individualism appears to have a positive impact. The PCA results reveal that power distance and uncertainty avoidance have similar directions and the empirical analyses confirmed our previous findings, which were in line with our expectations. Our results hold even after using alternative variables in the robustness section.

To the best of our knowledge, this is the first study that examines the aforementioned relationship. The overall results state a significant relationship between national culture and credit ratings, and that national culture influences the

default risk determinants. Moreover, this research confirms that the institutional environment influences firms' behavior, and performance. Given the importance of national culture on influencing firms' bankruptcy level and the influential role played by national culture on corporate management cultures, managers – more precisely, those of multinational enterprises – are advised to see culture as the material they work with, in which they enhance the positive manners in their policies and understand the environment they are operating in, which could lead to business failure if it is not well understood. This study could be extended by including different default risk measures, and other measures for national culture. The outstanding measures concerning national culture differ in the way of examination and interpreting the data. For instance, Venaik and Brewer (2008) find major inconsistencies across different cultural studies, and mostly concerning the negative correlation between Hofstede's cultural dimensions and that of the study of GLOBE. Future research is advised to develop a unified measure of national culture, that could be included in default risk measures to address this latter more accurately. Including an additional explanatory variable to default risk models – whether it is social, environmental, or cultural – even though it is a new step in the risk literature, yet it has been already discussed by scholars. Recently, the Finance and Risk Management industry decided to introduce environmental risks among the variables to model systematic risk. A similar approach therefore would be to include the cultural dimensions, given that it significantly influences firm default risk.

6 - END NOTES

[1] See: www.nytimes.com and www.chicagobusiness.com
[2] For instance: Schwartz, World Values Survey, and The GLOBE Study.
[3] Following Cao et al. (2019), we transform the price inflation rates using the formula $\pi^{*}= \pi/(1+ \pi)$, where π denotes the raw data series.
[4] See section 3.4.
[5] Results are available upon request from author.

7 - LIST OF TABLES AND FIGURES

Table 1: Descriptive statistics for the regression variables

This table reports the descriptive statistics for the variables used in the regression for 9767 observations covering 2621 firms distributed over 24 countries during the period 1991-2018. The table displays the mean, median, standard deviation, minimum, maximum, first quartile, third quartile and the total number of observations considered in our analyses. The dependent variables is the credit ratings (*CR*). The independent variables are power distance (PD*),* uncertainty avoidance (*UA*), individualism (*IDV*), and masculinity (*MAS*). The control variables are size (*SIZE*), profitability (*PROF*), liquidity (*LIQ*), leverage (*LEV*), annual growth of GDP (*G_GDP*), inflation (*INF*), and unemployment (*UNEMP*).

	Mean	**Median**	**St. Dev**	**Min**	**Max**	**Q1**	**Q3**	**N**
CR	11.96	12.00	3.67	2.00	23.00	10.00	15.00	9767
PD	41.53	40.00	7.40	11.00	95.00	40.00	40.00	9767
UA	48.10	46.00	9.25	29.00	95.00	46.00	46.00	9767
IDV	87.43	91.00	13.14	11.00	91.00	91.00	91.00	9767
MAS	61.50	62.00	6.44	5.00	95.00	62.00	62.00	9767
SIZE	3.41	3.35	0.65	1.20	5.73	2.95	3.83	9767
PROF	0.08	0.10	0.59	−21.58	20.67	0.04	0.17	9767
LIQ	0.10	0.09	0.24	−6.16	0.93	0.01	0.21	9767
LEV	0.36	0.32	0.25	0.00	6.88	0.20	0.47	9767
G_GDP	2.47	2.68	1.73	−6.29	11.31	1.74	3.77	9767
INF	0.62	0.70	0.42	−12.07	3.83	0.61	0.75	9767
UNEMP	5.87	5.45	1.73	1.80	18.37	4.62	6.80	9767

Table 2: The Pearson pairwise correlation coefficients between the variables

This table the Pearson pairwise correlation coefficients for 9767 observations covering 2621 firms distributed over 24 countries during the period 1991-2018. Coefficients which are highlighted by bold are significant at least at the 5% level. The dependent variables is the credit ratings (*CR*). The independent variables are power distance (PD*)*, uncertainty avoidance (*UA*), individualism (*IDV*), and masculinity (*MAS*). The control variables are size (*SIZE*), profitability (*PROF*), liquidity (*LIQ*), leverage (*LEV*), annual growth of GDP (*G_GDP*), inflation (*INF*), and unemployment (*UNEMP*).

	CR	***PD***	***UA***	***IDV***	***MAS***	***SIZE***	***PROF***	***LIQ***	***LEV***	***G_GDP***	***INF***	***UNEMP***
CR	1.00											
PD	**0.11**	**1.00**										
UA	**0.14**	**0.84**	**1.00**									
IDV	**−0.17**	**−0.87**	**−0.89**	**1.00**								
MAS	0.01	**−0.07**	**−0.02**	**0.20**	1.00							
SIZE	**0.50**	**0.17**	**0.22**	**−0.23**	**−0.03**	1.00						
PROF	**0.15**	0.01	0.01	−0.01	−0.01	**0.05**	1.00					
LIQ	**0.11**	**−0.04**	**−0.04**	**0.03**	0.01	**−0.09**	0.02	1.00				
LEV	**−0.37**	**−0.08**	**−0.08**	**0.10**	**0.01**	**−0.25**	**−0.08**	0.00	1.00			
G_GDP	**0.10**	0.00	**−0.05**	−0.01	**−0.06**	**−0.14**	0.02	0.02	0.00	1.00		
INF	**0.04**	**0.02**	**−0.10**	**0.03**	**−0.17**	**−0.07**	0.01	0.01	**−0.01**	**0.32**	1.00	
UNEMP	**−0.04**	**0.03**	**0.05**	**−0.03**	**−0.17**	**0.03**	0.01	**0.03**	−0.03	**−0.44**	**−0.20**	1.00

Figure 1: Principle component analysis concerning Hofstede's cultural dimensions

This figure shows the biplot obtained from after applying the PCA method concerning the first two dimensions in Hofstede's cultural dimensions. The sample consists of 24 different countries.

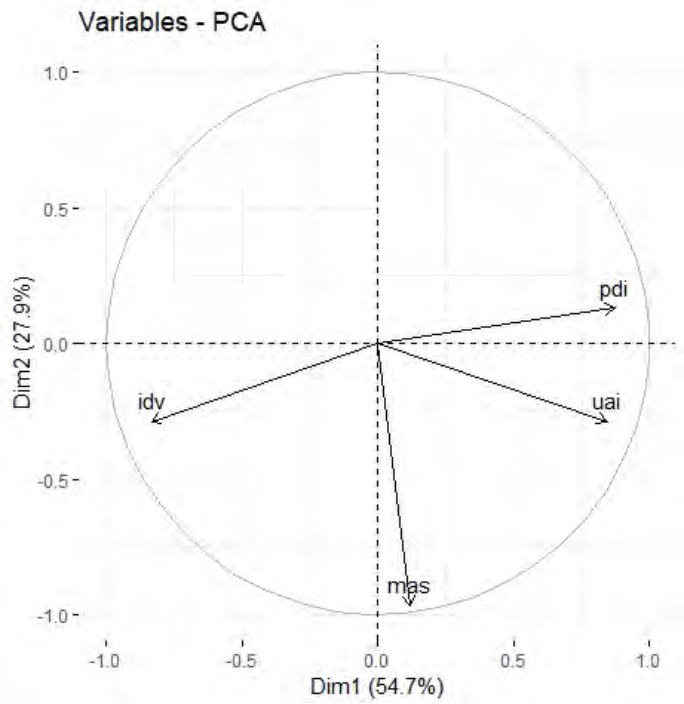

Table 3: Aggregate firm default risk average per country

This table reports the average of firm default risk − measured by credit ratings − with respect to their corresponding country where they are operating.

Country ID	Mean	Country ID	Mean	Country ID	Mean
ANT	8.38	DOM	4.50	MHL	7.79
ARG	8.97	ESP	14.37	NLD	12.64
AUS	14.10	FIN	14.17	NOR	13.71
AUT	14.50	FRA	12.71	NZL	17.00
BEL	14.67	GBR	14.00	PAN	14.80
BHS	6.25	GGY	13.00	PER	12.00
BMU	9.08	GRC	13.89	PHL	12.75
BRA	13.40	HKG	14.44	POL	3.67
CAN	9.83	HUN	11.63	PRT	15.43
CHE	13.56	IDN	10.00	RUS	7.71
CHL	14.69	IND	11.62	SGP	10.80
CHN	14.34	IRL	11.61	SWE	14.54
COL	12.20	ITA	15.33	TUR	9.91
CUW	18.67	JPN	16.45	TWN	17.47
CYM	12.50	KOR	14.29	USA	10.82
CYP	10.00	LUX	8.46	VEN	6.44
DEU	14.90	MCO	8.00	VGB	10.40
DNK	17.25	MEX	12.53	ZAF	14.90

Table 4: Examining the impact of national culture on firm default risk

This table reports the results from regressing the dependent variable CR over the main explanatory variable CULTURE which is replaced respectively by PD, UA, IDV, and MAS (respectively), and the control variables, namely: SIZE, PROF, LIQ, LEV, G_GDP, INF, and UNEMP in addition to year and sector fixed effects, over the period 1991-2018 within a total number of observations 9767. The table reports the relative coefficients of the explanatory variables, where the t-values are reported between the parentheses under its corresponding variable. The R^2, adjusted R^2, and the total number of observations are reported also.

	(1)	(2)	(3)	(4)
PD	0.014***			
	(3.785)			
UA		0.013***		
		(4.076)		
IDV			−0.013***	
			(−6.167)	
MAS				0.012**
				(2.531)
SIZE	2.995***	2.985***	2.962***	3.021***
	(62.069)	(61.483)	(60.820)	(62.995)
PROF	0.565***	0.565***	0.566***	0.565***
	(11.983)	(11.983)	(12.019)	(11.975)
LIQ	2.201***	2.203***	2.195***	2.202***
	(18.624)	(18.641)	(18.594)	(18.622)
LEV	−2.933***	−2.938***	−2.921***	−2.961***
	(−25.096)	(−25.160)	(−25.025)	(−25.363)
G_GDP	0.021	0.035	0.015	0.053
	(0.563)	(0.964)	(0.412)	(1.386)
INF	−0.134*	−0.083	−0.109	−0.070
	(−1.657)	(−1.023)	(−1.347)	(−0.837)
UNEMP	−0.060**	−0.064**	−0.068**	−0.021
	(−2.047)	(−2.173)	(−2.329)	(−0.676)
c_constant	4.462***	4.472***	6.397***	3.896***
	(11.786)	(11.915)	(14.745)	(7.260)
INDUSTRY	YES	YES	YES	YES
YEAR	YES	YES	YES	YES
R^2	0.463	0.463	0.464	0.463
Adj. R^2	0.461	0.461	0.462	0.460
N	9767	9767	9767	9767

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

Table 5: Examination within PCA dimensions

This table reports the results from regressing the dependent variable CR over the first two dimensions obtained from PCA components, and the control variables, namely: SIZE, PROF, LIQ, LEV, G_GDP, INF, and UNEMP in addition to year and sector fixed effects, over the period 1991-2018 within a total number of observations 9767. The table reports the relative coefficients of the explanatory variables, where the t-values are reported between the parentheses under its corresponding variable. The R^2, adjusted R^2, and the total number of observations are reported also.

Dependent Variable	**With PCA dimensions**
Dim1	0.217***
	(5.403)
Dim2	-0.172*
	(-1.683)
SIZE	2.977***
	(61.3)
PROF	0.566***
	(12.008)
LIQ	2.205***
	(18.662)
LEV	-2.928***
	(-25.070)
G_GDP	0.046
	(1.193)
INF	-0.066
	(-0.785)
UNEMP	-0.046
	(-1.475)
c_constant	5.267***
	(13.239)
INDUSTRY	YES
YEAR	YES
R2	0.4637
Adj. R2	0.4613
N	9767

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

Table 6: Examining the impact of national culture on firm default risk with alternative control variables

This table reports the results from regressing the dependent variable CR over the main explanatory variable CULTURE which is replaced respectively by PD, UA, IDV, and MAS (respectively), and the control variables, namely: SIZE, PROF, RE_TA, LIQ, QR, TL_TA, TANG, G_GDP, INF, and UNEMP in addition to year and sector fixed effects, over the period 1991-2018 within a total number of observations 9453. The table reports the relative coefficients of the explanatory variables, where the t-values are reported between the parentheses under its corresponding variable. The R^2, adjusted R^2, and the total number of observations are reported also.

	(1)	(2)	(3)	(4)
PD	0.016***			
	(4.166)			
UA		0.013***		
		(4.029)		
IDV			-0.014***	
			(-6.288)	
MAS				0.011**
				(2.230)
SIZE	2.868***	2.860***	2.835***	2.895***
	(58.323)	(57.819)	(57.174)	(59.268)
PROF	0.552***	0.552***	0.552***	0.553***
	(11.547)	(11.545)	(11.567)	(11.552)
RE_TA	0.580***	0.578***	0.580***	0.578***
	(13.115)	(13.089)	(13.149)	(13.061)
LIQ	0.393**	0.385**	0.391**	0.374**
	(2.564)	(2.515)	(2.556)	(2.445)
QR	-0.094***	-0.094***	-0.094***	-0.095***
	(-5.470)	(-5.442)	(-5.448)	(-5.488)
TL_TA	-2.181***	-2.190***	-2.160***	-2.215***
	(-17.929)	(-18.019)	(-17.773)	(-18.242)
TANG	0.114**	0.112**	0.103**	0.119**
	(2.321)	(2.270)	(2.108)	(2.417)
G_GDP	-0.023	-0.007	-0.028	0.008
	(-0.625)	(-0.195)	(-0.760)	(0.199)
INF	-0.150*	-0.100	-0.124	-0.092
	(-1.864)	(-1.230)	(-1.534)	(-1.115)
UNEMP	-0.060**	-0.064**	-0.068**	-0.024
	(-2.060)	(-2.163)	(-2.325)	(-0.751)
c_constant	5.200	5.270	7.220	4.793
	(13.127)	(13.433)	(16.096)	(8.657)
INDUSTRY	YES	YES	YES	YES
YEAR	YES	YES	YES	YES
R^2	0.482	0.481	0.483	0.481
Adj. R^2	0.479	0.479	0.480	0.478
N	9453	9453	9453	9453

***, **, * indicates significance at the 1%, 5%, and 10% levels, respectively.

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