

# National Culture and Capital Structure

## Abstract

Nowadays, many economists accept that culture plays a crucial role in economic outcomes. Existing capital structure theories, in particular the pecking order theory and the agency theory, can be linked to national culture. Furthermore, research in finance has shown the power of incorporating country factors into capital structure analysis. Remarkably enough, at the same time the factor of national culture has not been studied extensively. This paper seeks to determine the influence of national culture on capital structure. I use multilevel data from 1995-2015 covering 40,677 firms from 73 countries. I test for the effect of national culture, using Hofstede's dimensions, on leverage. Main adaptations of this research are the inclusion of social trust scores and interaction effects between national culture and firm-level factors as predictors of capital structure. The results show that the dimensions of masculinity, uncertainty avoidance and social trust are significant determinants of leverage. No significant effects for individualism, power distance and long-term orientation are found. I also show that moderating effects between culture and firm-level variables play a role in determining leverage. The combination of direct and moderating effects of culture on capital structure suggests that incorporating culture into capital structure research can be very useful.

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Radboud University, 11-07-2018

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## Chapter 1: Introduction

What factors do and do not affect the capital structure of firms is one of the most researched puzzles in financial economics (Bokpin, 2009). Debt and equity are both associated with costs and benefits (Titman & Wessels, 1988). Managers can thus increase firm value by finding an optimal mix between the two. One of the earliest models on the optimal capital structure of firms is the influential model by Modigliani and Miller (1958). This model assumes no bankruptcy risk and no taxes and shows that under these circumstances the capital structure becomes irrelevant for firms; the cost of issuing debt or issuing equity should be equal. Later, models became more sophisticated, for example the model by Scott Jr. (1976). This model can work with less assumptions and shows that there is in fact an optimal capital structure for firms, which is determined by many factors. Also, further theories that can explain capital structure were developed, including the pecking order theory (Myers, 1984) and the principal-agent theory (Jensen & Meckling, 1976).

In practice, empirical studies were in support of models showing that the capital structure of firms is determined by multiple factors. In the 1970s and 1980s empirical studies that tried to find the main firm determinants of capital structure were published (e.g., Taub, 1975; Titman & Wessels, 1988). These papers find that determinants of capital structure include profitability of the firm, uniqueness of the business and firm size. Later we can see more and more articles on the topic that consider country-level factors as well, in addition to the firm-level factors of earlier research. One of the first papers that included country factors is the article by Aggarwal (1981). This research combines data of firms from various European countries and shows that the home country of the firm is in fact a powerful determinant of the capital structure of the respective firm. Further research on the topic shows that it is not only the average capital structure of firms that varies greatly over countries, it is also found that the other determinants, such as the tangibility, are more important in determining the capital structures in some countries than in other countries (de Jong et al., 2008). This means that country factors are of extra importance, as they can have both a direct effect on capital structure, and a moderating effect, by altering the power and sign of firm-level determinants.

There are different ways through which the location of a firm can influence its leverage. Amongst others, legal factors can be of influence. Deesomsak et al. (2004) find that creditor's protection of countries plays a big role in determining the capital structure of firms within their countries. Antoniou et al. (2008) similarly find that institutions are important. By comparing market based and bank based economies they conclude that the economic environment is important in determining the firm-level determinants for capital structure.

Indeed, research has shown the power of incorporating country factors into capital structure analysis, but not all factors have been considered extensively. One important factor that is not considered often in these country comparisons is culture. This is interesting given the fact that many economists now accept that culture plays a crucial role in economic outcomes (Beugelsdijk & Maseland, 2011; Guiso et al., 2006). Available literature is mostly in support of the notion of a relationship between culture and capital structure. Sekely and Collins (1988) divide the world into cultural clusters to explain capital structure. Their research suggests that cultural factors might be of importance. The article by Chui et al. (2002) adds the factor of national culture by including Schwartz's (1994) cultural value orientations into the analysis. Their research is conducted with data of 22 countries and tests for the dimensions of *mastery* and *conservatism*. They find that these dimensions play a significant role in determining capital structure. Earlier research by Gleason et al. (2000) also takes culture into account, but limits itself to studying 4 cultural clusters of European countries. Wang and Esqueda (2014) limit the scope of their research to emerging-market ADRs. They employ Hofstede's cultural dimensions and find as well that national culture impacts leverage. It is interesting that a lot of research only considers countries of a single continent or of certain level of development. Arguably, research using cultural determinants benefits from using a large amount of countries worldwide so the entire cultural spectrum is represented. Furthermore, it is of use to employ all cultural dimensions that can be theoretically linked to capital structure.

This paper seeks to determine the cultural determinants of capital structure. In the following chapter I argue that social trust and specific dimensions of national culture have both direct and moderating effects on the capital structure of firms. Existing capital structure theories, in particular the pecking order theory and the agency theory, can be related to national culture and cultural differences; agency costs are dependent on the level of individualism (Davis et al., 1997) and the factor of information asymmetry, which is used in the pecking order theory, is dependent on so-called power distance. This thesis then provides an overview of existing empirical research on the topic. After this, empirical tests follow. The dataset contains data from 1995-2015 of 40,677 firms from 73 countries worldwide. I combine firm-level financial data with the national culture by using all scores of Hofstede's 6 dimensions (Hofstede, 2010) and the levels of social trust in all countries (Inglehart et al., 2014).

The results of this research indicate that national culture affects the capital structure of firms. Regarding direct effects, I observe that the Hofstede dimensions of uncertainty avoidance, masculinity and social trust significantly explain variance in capital structure of firms. Furthermore, little evidence is found for moderating effects of culture on capital structure between the cultural dimensions of power distance and uncertainty avoidance and firm-level variables of profitability and liquidity.

## Chapter 2: Background

### 2.1. Theoretical Studies of Capital Structure

Since the 1950s many theories have been developed about how the capital structure of firms is determined. Most models about the optimal capital structure of firms consider the costs of debt and equity. The firm's optimal debt to equity ratio is thus usually viewed as a tradeoff between costs and benefits of issuing debt (Myers, 1984). The main difference between earlier models and later models is that models became more sophisticated over time, being subject to less assumptions. Empirical research on the topic followed in the 1970s and is discussed in section 2.2.

#### *2.1.1. Modigliani-Miller Type Models*

A model that is often considered one of the most influential on theory of the capital structure of firms is the model by Modigliani & Miller (1958). This model has a market-value approach to find the determinants of capital structure. This model works with assumptions; efficient markets, no bankruptcy risk, no agency costs and no taxes. Under these assumptions Modigliani and Miller show that the capital structure of firms becomes irrelevant. The many assumptions make the model less applicable to the real world. Nevertheless, it is an important model to consider. Mostly because by showing under which circumstances the capital structure does not matter, it can also suggest under which circumstances the capital structure does matter.

In 1976 Scott Jr. published another model that is based on the model by Modigliani & Miller. While it can work with the same assumptions as Modigliani & Miller's model, resulting in the same outcome as this model, it can also work with less assumptions. Under these circumstances the model shows that the capital structure of firms does in fact matter as the cost of issuing equity and issuing debt can vary greatly, depending on factors including tax rates, firm size and bankruptcy risks.

#### *2.1.1.1. Principal-Agent Theory*

The principal-agent theory is a widely used theory that can be applied to theorize the capital structure determinants for tradeoff models. As stated before, the early capital structure model of Modigliani and Miller (1958) assumes no agency costs. This suggests that agency costs actually can play a role in determining the optimal capital structure of firms. Jensen and Meckling (1976) describe agency costs as a sum of the monitoring expenditures by the principal, the bonding expenditures of the agent and the residual loss. This theory can be related to capital structure by looking at how agency costs affect the costs of debt and equity. According to Friend and Lang (1988) agency costs in a firm can increase

bankruptcy risks, which causes firms to issue less debt than optimal. Jensen and Meckling (1976) show that this relationship between cost of debt and agency costs emerges because of restrictions lenders place on firm activities when agency costs are high. Meanwhile, multiple papers, most importantly the paper by Davis et al. (1997) state that the agency theory (wrongfully) assumes that agents in a principal-agent relationship only have individualistic utility motivation. In reality, national culture could have an impact on agency costs by influencing the manager's level of individualistic motivation.

### *2.1.2. Pecking Order Theory*

Another important theory that has dominated capital structure literature is the pecking order theory (de Jong et al., 2011). According to Myers (1984) the pecking order theory is at least as powerful in explaining capital structure as traditional tradeoff theories. The pecking order or asymmetric information theory states that firms follow a rather strict hierarchy in choosing their funds. Firms prefer internal finance, but if external finance is required they prefer issuing debt first. Equity is only issued as a last resort (Myers, 1984). The reason that firms follow a strict order in financing is that by issuing debt, but the most by issuing equity the firm might signal to investors that it is in trouble or overvalued, even if this is not the case. This is the result of information asymmetry between the management and investors. The level of information asymmetry is assumed to be given in Myers' model. In reality, it might be dependent on various factors, including cultural factors. These cultural factors will be discussed in section 2.3.

## 2.2. Empirical Research

Empirical research on the topic of capital structure started off in the 1970s, with one early paper being published by Taub in 1975. This research found that correlation between the firm's return minus the long-term interest rate and the leverage ratio is positive. Meanwhile, uncertainty was found to have a negative impact on the leverage ratio of firms, although not always significantly. Also, market-to-book ratio has been shown to determine the capital structure of firms (Baker & Wurgler, 2002). Rajan and Zingales (1995) found that firm profitability plays a role in determining capital structure as well.

More recent empirical research includes country factors into the analysis (e.g., Aggarwal, 1981; Sekely & Collins, 1988; De Jong et al., 2008). Sekely and Collins note that, around the time their paper was published, the country factor had been proven to be a significant variable in many studies. But, they also note that it is then still unexplained why this factor plays a role. Later research shows that there are various determinants at a national level; Legal System (Deesomsak et al., 2004), bank vs. market based system (Antoniou et al., 2008). Another determinant at a national level could be culture.

The study by Sekely and Collins (1988) is in support of this view. Their study divides the world into cultural realms to explain capital structure. The results suggest that culture might be the missing factor in explaining capital structure. One would expect studies taking this factor into account to follow rapidly. It was, however, not until the year 2000 when there was a study published that used national culture as a determinant in a capital structure analysis. Empirical studies of the relationship between culture and capital structure will be discussed in section 2.4. First, I will discuss the theoretical foundation of this relationship.

### 2.3. National Culture and Capital Structure

Geert Hofstede (1980) defines culture as “the collective mental programming of the people in an environment” (p. 43). The relationship between culture and economics has become more apparent over time. One reason for this is the rise of new institutional economics. New institutional economics uses analytical concepts which include concepts like social networks, social exchange and culture (Richter, 2005). The development of cultural databases like the Hofstede indices (1983) likely attributed to increasing adaptation of culture in economic analyses as well. Hofstede’s work can be seen as one of the most influential attempts to quantify culture. It was created in 1983 and aims to explain national culture by surveys using 4 cultural dimensions; individualism vs. collectivism, power distance, uncertainty avoidance, and masculinity vs. femininity. Later long vs. short-term orientation and indulgence vs. restraint were added, bringing the total amount of dimensions to 6 (Hofstede, 2011). Individual countries get assigned scores from 0-100 for all respective dimensions. At present index scores for over 100 countries, from all continents, are available.

Alternatives for the Hofstede’s theory have been developed as well. Project GLOBE is a cross cultural study with data of 61 countries. It is aimed at studying the links between culture and leadership (House et al., 2002). Another often cited work is the theory of cultural value orientations created by Schwartz (1994). In Schwartz’s book the dimensions made by Hofstede are criticized and redefined. Schwartz notes: “Hofstede recognized that his four dimensions are not necessarily exhaustive” (p. 3), hence Schwartz creates a larger amount of dimensions. He introduces the following 7 dimensions: conservatism, intellectual and affective autonomy, hierarchy, mastery and egalitarian commitment. As mentioned, Hofstede himself similarly increased the total amount of dimensions in his Hofstede index to 5 and later 6 (Hofstede, 2011). Schwartz also notes that Hofstede’s dimensions can be described as culture-level dimensions. These dimensions cannot be observed directly and are difficult to measure. Schwartz argues that for this reason it is better to use dimensions at an individual level. So, which is better; Hofstede’s theory or Schwartz’s? It depends. One study by Gouveia and Ros (2000) shows that,

while the Hofstede dimensions are better at explaining macroeconomic variables, the Schwartz cultural values are better at explaining macrosocial indicators. My research employs the Hofstede dimensions mostly for practical reasons; more country scores are available for the Hofstede indices.

The Hofstede's cultural dimensions and its respective successors can be linked both theoretically and empirically to the capital structure of firms. This link can be a direct link meaning that culture has a direct impact on capital structure decisions of firms, or an indirect link meaning that the dimensions influence the effect of firm-level factors. As this paper focuses on Hofstede's theory, I will proceed with a description of the six dimensions with, in addition, a theoretical foundation of how dimensions can be linked to existing capital structure theory.

### *2.3.1. Hofstede's Dimensions of National Culture*

#### *Individualism vs. Collectivism*

The dimension of individualism vs. collectivism defines to which extent people are integrated in groups. If people are moving in groups it means that personal interests are less important than group interests. Meanwhile, in countries with individualistic culture, everyone is supposed to take care of him- or herself (Hofstede, 2011). Individualism tends to prevail in western Europe and the US. For this reason, many economic theories including the principal-agent theory are often criticized for its assumption of a certain level of individualism. According to Davis et al. (1997) the level of agency costs arising from the principal-agent relationship may in fact be dependent on the level of individualism of the actors. This suggests that the Hofstede dimension of individualism vs. collectivism can in this way influence the validity of economic theory, in particular principal-agent theory. If people are behaving individualistically, agency costs are expected to be higher than if people were to move in groups.

#### *Power Distance*

Power distance is defined by Hofstede (2011) as "the extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally" (p. 9). This unequal distribution of power is respected by both the leaders and the followers. In countries with a large power distance, people have no problem leaving decisions to authority. There is a negative correlation between individualism and power distance scores of countries. However, both are conceptually different (Hofstede, 2003). Power distance measures emotional dependence on people in power. Meanwhile, individualism measures emotional (in)dependence on groups. Power distance is also related to information asymmetry. People in countries with a lower power distance read more news, but do not trust information as easily (Hofstede, 1998).

### *Uncertainty Avoidance*

The uncertainty avoidance dimension measures people's tolerance for uncertainty and ambiguity. This is not the same as risk avoidance, in the sense that uncertainty avoidance is rather a measurement of how people feel in unstructured and unpredictable situations. According to Hofstede (2011), societies with high uncertainty avoidance have strict behavioral codes, laws and rules to avoid unstructured situations. Uncertainty avoidance does not only apply to individuals but also can be observed in the behavior of companies; uncertainty avoidance is associated with secrecy in disclosure of information by companies (Archambault & Archambault, 2003).

### *Masculinity vs. Femininity*

Masculinity vs. Femininity is described by Hofstede (2011) as the distribution of values between genders. If a society is more masculine there is a stronger distinction between male and female values, whereas in a feminine society the boundaries are less significant; males and females roughly have the same values. According to Hofstede (2008) masculine societies stress ego goals more than societal goals. This results in masculine societies being more competitive and assertive than feminine societies. This dimension is interesting as it is, opposed to other dimensions, not correlated with wealth. Furthermore, there are masculine and feminine countries found across all continents (Hofstede, 1998).

### *Long-Term vs. Short-Term Orientation*

Long-term orientation means that society is more future oriented, the most important events will take place in the future. People living in countries with a long-term orientation are more willing to anticipate uncertain future events. This means that companies in these countries are willing to develop strategies that adapt to changing circumstances. In fact, values of long-term oriented entrepreneurship are held broadly within society. The dimension is shown to strongly correlate with recent economic growth (Hofstede, 2011).

### *Indulgence vs. Restraint*

The last addition to the Hofstede index is indulgence vs. restraint. Indulgence captures aspects not covered by the other 5 dimensions (Hofstede, 2011). It measures people's perception of their life. In countries that score highly for indulgence people tend to declare themselves happy. There is a relatively free gratification of desires and maintaining order in the nation is not given a high priority. Meanwhile, countries scoring highly for restraint have stricter societal norms and a perception of helplessness ("what happens to me is not my own doing").

### 2.3.2. *Social Trust*

Another fundamental element of a country's social capital is trust (Ortiz-Ospina & Roser, 2017). The World Values Survey measures trust across nations via surveys. Results show that there are large, time persistent differences in levels of trust between nations. Trust in others can be an important predictor of economic outcomes. According to Ortiz-Ospina and Roser (2017) trust scores as measured in surveys are often unreliable in predicting actual trusting behavior, but scores predict trustworthiness of people quite well. If this is related to agency theory, I expect agency costs for firms located in countries with trustworthy people to be lower; a principal-agent relationship will be associated with less agency costs.

### 2.4. Prior Research on National Culture and Capital Structure

Empirically, there is also evidence suggesting that culture is an important determinant for various firm-level variables. One early research that linked national culture to business practices was written by Newman and Nollen (1996). Nevertheless, only few studies have taken culture into account so far in determining the capital structure of firms. One of the first studies that has taken into account culture to determine the capital structure of firms is by Gleason et al. (2000). It divides European countries into four clusters based on cultural characteristics by Hofstede. It looks at how being part of a cultural cluster affects the capital structure of retailers within these countries and finds that these cultural clusters significantly affect capital structure. The one problem with this study is that all countries, except for Portugal have an individualistic orientation. This means that it is not possible to properly test the effect of the cultural dimension of individualistic orientation on capital structure. Furthermore, one could argue that European countries are culturally more related than countries in different parts of the world. For this reason global studies might be more interesting and useful to conduct.

The study by Chui et al. (2002) takes into account more countries; 21, mostly developed countries and only a few less developed, e.g. Thailand and Mexico. It does not limit itself to one continent like the article of Gleason et al. did. It uses the Schwartz indices for its research. The study finds that countries with high scores on the Schwartz's dimension of conservatism tend to have lower corporate debt ratios. The same is found to be true for the dimension of mastery. Both the study by Gleason et al. and the study by Chui et al. are thus supportive of the view that culture matters in determining capital structure. A more recent study by Wang and Esqueda (2014) looks at ADRs from emerging countries specifically in determining how culture affects capital structure decisions. The research uses the Hofstede dimensions. It finds that countries scoring high on individualism and indulgence employ more debt. Meanwhile, the other cultural dimensions of Hofstede are associated with less debt. Note that most studies so far only look at direct effects of national culture on leverage.

## Chapter 3: Research Question and Hypotheses

I show that various existing theories on the topic have a cultural component by nature. Theories such as the principal-agent theory are in fact directly influenced by cultural factors. If we combine this component of these often used theories to explain capital structure of firms, with the more general development in economics of employing institutional factors to explain economic outcomes, we can see why research on the link between culture and the capital structure of firms is relevant. In other words: it can be very useful to add cultural variables to the analysis of capital structure determinants. In addition to Hofstede's cultural dimensions, I would like to add social trust scores of countries, as theory predicts the level of trust within a nation to be able to influence leverage via principal-agent relationships. This information leads to the research question: *"How does national culture affect the capital structure of firms?"*.

It is predicted that national culture affects the capital structure of firms within a country. This is based both on the results of previous empirical research, and on the fact that existing capital structure theories have a cultural component. The effects of national culture on capital structure can be separated into two categories; direct effects and moderating effects and will be discussed in sections 3.1. and 3.2., respectively.

### *3.1. Direct Effects of National Culture on Capital Structure*

If we take the six Hofstede dimensions and social trust into account we can link them theoretically to the existing theories of capital structure. By doing this, I hypothesize the direct effects these dimensions have on the capital structure of firms. See Table 1 for a summary of the expected direct effects of the dimensions on leverage.

#### *Pecking Order Theory*

The dimension of power distance can be related to pecking order theory. Pecking order theory, which predicts companies to adhere to a strict hierarchy in financing choices, hypothesizes power distance to be associated with higher levels of leverage. This arises from the fact that the pecking order theory assumes a given level of information asymmetry, leading to higher costs of equity than for other forms of financing (Myers, 1984). The level of information asymmetry in a country may in fact depend on many factors, including cultural. Research by Lang & Lundholm (2000) shows that firms disclose information in anticipation of equity offerings to lower the information asymmetry. In countries with a large power distance, information asymmetry can be expected to be widespread, because people do

not intervene with people in charge and might accept information asymmetry more easily. Meanwhile, in societies with a low level of power distance there is less information asymmetry expected. People in these countries read more news and do not take information at face value (Hofstede, 1998). This means that in countries with low power distance we can expect firms to be more willing to issue equity, driven by low levels of information asymmetry, and vice versa.

***-H1: Leverage of firms is positively related to the level of power distance of a country.***

Uncertainty avoidance can be related to the pecking order theory as well. If firms follow a strict hierarchy in means of financing, they choose issuing equity only as a last resort. Issuing equity is seen as more risky than issuing debt because issuing equity might signal to outsiders that the stock is overvalued. Uncertainty avoidance can in this way determine how strong the effect of the pecking order is in reality. In other words; managers or investors having a low tolerance for uncertainty and ambiguity strengthen their use of a pecking order in financing, because issuing equity will be associated with more ambiguity than using internal finance or debt. The effect of a pecking order is also strengthened by the fact that companies in countries with a high level of uncertainty avoidance are disclosing less information to shareholders (Archambault & Archambault, 2003). This increases information asymmetry, which leads to issuing equity becoming a less favorable option as well.

***-H2: Leverage of firms is positively related to the level of uncertainty avoidance of a country.***

The cultural dimension of indulgence relates mostly to *happiness research*. Because of this, the link to leverage of firms is not as apparent as for other dimensions. Hofstede (2011) does note that countries scoring highly for indulgence do not give priority to maintaining order in society. In this perspective, the dimension could be related to pecking order theory. However, it is not clear whether striving for order in society can be properly translated to striving for order in firms. This means that I do not develop an alternative hypothesis for the effect of this dimension on leverage of firms.

*Tradeoff (Agency) Theory*

Social trust is another variable related to culture that can be linked to capital structure. Especially agency costs can be influenced by the level of trustworthiness of people. If it is true that agency costs diminish in countries with high levels of trust, we can expect for firms in these countries a use of more leverage than for countries with low levels of trust. This is because managers will behave in line with

all stakeholders and not use suboptimal levels of debt. Furthermore, Amiraslani et al. (2017) show that firms that are viewed as trustworthy have better access to primary bond markets. This results in a decrease in costs of debt for firms. Following this, agency theory suggests a positive effect for social trust on leverage.

***H3: Leverage of firms is positively related to the level of trust in a country.***

High levels of individualism, occurring in countries where people move less in groups and behave more individualistically, are theoretically associated with higher agency costs (Davis et al., 1997). The principal-agency theory (Jensen & Meckling, 1976) predicts these so-called agency costs to arise from conflicts of interest between the management, stockholders and lenders. Managers often have equity-based incentives to behave in line with stockholders' interests (Mehran, 1995). This causes management to engage in more risk taking, increasing bankruptcy risk, at the expense of lenders. Scott Jr. (1976) shows in his tradeoff model that bankruptcy risks increase the costs of issuing debt. In this way, it will be less attractive for risk-taking managers to issue debt, than it is to issue equity. As Friend and Lang (1988) state: "the level of debt decreases as the level of management shareholding in the firm increases" (p. 280). Higher agency costs, which arise from managerial self-interest, are thus theoretically associated with restricted leverage and debt maturity (Leland, 1998). This leads to:

***H4: Leverage of firms is negatively related to the country's level of individualism.***

*Tradeoff Theory; Debt Covenants and "Locus of Control"*

A company that is willing to take a lot of debt will have to bond itself to debt covenants for a long time. This contradicts the long-term strategies that are associated with long-term oriented countries. Furthermore, a long-term orientation has often been shown to increase the profitability of companies (Friend & Lang, 1988). Research shows that profitability is associated with a low leverage of a company (Rajan & Zingales, 1995). This means that the dimension of long-term vs. short-term orientation can impact capital structure as well via the channel of profitability.

***H5: Leverage of firms is negatively related to long-term orientation in a country.***

Masculinity is associated with a strong distinction between male and female values in a country. In masculine countries ego goals play an important role. These so-called *ego goals* can be

related to the effect that Chui et al. (2002) describe as *locus of control*. Chui et al. describe how people living in countries with a high mastery score have a strong desire to be or feel in control. This means that managers in these countries are less willing to bond themselves to debt covenants, because these covenants will limit the level of control that managers experience. While Chui et al. apply this theory to the Schwartz value of mastery, it can be applied to the Hofstede dimension of masculinity as well. This is especially true because Schwartz's mastery correlates with masculinity (Hofstede, 1998). This leads to:

**H6: Leverage of firms is negatively related to the level of masculinity in a country.**

Table 1  
Dimensions and Expected Direct Effects

Dimension	Expected Effect on Leverage	Supporting Theory
Power Distance	+	Pecking Order Theory
Uncertainty Avoidance	+	Pecking Order Theory
Indulgence (vs. Restraint)	NA	Pecking Order Theory
Social Trust*	+	Tradeoff (Agency) Theory
Individualism (vs. Collectivism)	-	Tradeoff (Agency) Theory
Long-Term (vs. Short-Term Orientation)	-	Tradeoff Theory
Masculinity (vs. Femininity)	-	Tradeoff Theory

+ = positive, - = negative \* = Social Trust is as measured by World Values Survey and is not a Hofstede dimension.

### 3.2. Moderating Effects

Besides the direct effect of culture on capital structure there is also reason to expect moderating effects. This means that culture can also affect capital structure indirectly by influencing (i.e., moderating) the effects of firm-level determinants. To predict moderating effects the same theories that I use to predict the direct effects can be used; the pecking order theory and the tradeoff (agency) theory. See Table 2 for a summary of the predicted moderating effects of culture on capital structure. Whereas more interaction effects could theoretically exist between variables, I would like to focus on only a few. The main reason is because empirically, there is not a lot of evidence yet on the existence of moderating effects of national culture on capital structure. This means that I will approach these effects in a simple way.

### *Pecking Order Theory*

The main cultural dimensions that can be related to capital structure via pecking order theory are power distance and uncertainty avoidance. Both dimensions are in fact predicted to positively affect capital structure by strengthening the pecking order that firms use, see also 3.1. For this reason, I expect that interaction effects take place with firm-level variables that also affect capital structure via the pecking order. The most important firm-level determinants that can be linked to capital structure via pecking order theory are: liquidity and firm profitability, see also Appendix 1. I ignore the variable of investment opportunities, because of contradicting findings of this variable in empirical research, and the possibility of time persistent effects of this variable (Baker & Wurgler, 2002). Pecking order theory predicts liquidity to have a negative effect on leverage. This is because firms that are using the pecking order to determine their capital structure can use accumulated cash and other liquid assets as an internal source of funding. These funds will be used first, instead of debt (de Jong et al., 2008). A similar effect is predicted for profitability. If firms with high levels of profitability work with the pecking order, they are expected to use more internal finance, for example via retained earnings, than less profitable firms. This means I predict a negative effect of both liquidity and profitability on leverage.

The effects of these firm-level variables on capital structure are thus dependent on the strength of the pecking order that firms use. If firms do not use a pecking order, the predicted effects of liquidity and profitability as described in the previous paragraph do not hold. As stated, I expect both high levels of power distance and high levels of uncertainty avoidance to strengthen the pecking order of companies. Because of the link of pecking order between these firm-level and country-level variables, I predict the dimensions of power distance and uncertainty avoidance to strengthen the pecking order of firms and thus strengthen the (negative) effects of liquidity and profitability on leverage. This leads to:

***-H7a: In countries with higher levels of power distance, the effect of liquidity on capital structure is more strongly negative than in countries with lower levels of power distance.***

***-H7b: In countries with higher levels of power distance, the effect of profitability on capital structure is more strongly negative than in countries with lower levels of power distance.***

***-H7c: In countries with higher levels of uncertainty avoidance, the effect of liquidity on capital structure is more strongly negative than in countries with lower levels of uncertainty avoidance.***

***-H7d: In countries with higher levels of uncertainty avoidance, the effect of profitability on capital structure is more strongly negative than in countries with lower levels of uncertainty avoidance.***

*Tradeoff (Agency) Theory*

The dimensions that I link to capital structure by using tradeoff (agency) theory are individualism and social trust (again note that the latter one is not a Hofstede dimension). Social trust is predicted to decrease agency costs because it is related to higher levels of trustworthiness (Ortiz-Ospina & Roser, 2017). I link this decrease in agency costs then to an increase in leverage. The opposite is true for individualism, which is related to higher agency costs (Davis et al., 1997). Higher agency costs are theoretically associated with restricted leverage and debt maturity (Leland, 1998).

Meanwhile, the main firm-level variable that can be related to capital structure via agency theory is firm size, see also Appendix 1. Small firms are associated with lower levels of debt because of information asymmetry problems that are more apparent in small firms (de Jong et al., 2008). In other words; firm size is predicted to be positively related to leverage.

Note that if this negative effect of firm size on leverage is in fact the result of information asymmetry, this information asymmetry in small firms will only lead to an increase in agency costs if this asymmetry is utilized by the agent. In countries with high levels of trust (read: trustworthiness) and low levels of individualism, this information asymmetry is predicted to be less likely exploited. This means that I predict that the positive firm size effect is smaller in countries in which agency problems arise less often, and vice versa.

***-H8a: In countries with higher levels of social trust, the effect of firm size on leverage is more weakly positive than in countries with lower levels of social trust.***

***-H8b: In countries with higher levels of individualism, the effect of firm size on leverage is more strongly positive than in countries with lower levels of individualism.***

Table 2

**Dimensions and Expected Moderating Effects**

<b>Cultural Dimension</b>	<b>Firm-Level Variable</b>	<b>High Levels of Cultural Dimension Cause Firm-Level</b>	<b>Supporting Theory</b>
Power Distance	Liquidity	Stronger negative effect	Pecking Order Theory
Power Distance	Profitability	Stronger negative effect	Pecking Order Theory
Uncertainty Avoidance	Liquidity	Stronger negative effect	Pecking Order Theory
Uncertainty Avoidance	Profitability	Stronger negative effect	Pecking Order Theory
Social Trust	Firm Size	Weaker positive effect	Tradeoff (Agency) Theory
Individualism	Firm Size	Stronger positive effect	Tradeoff (Agency) Theory

## Chapter 4: Data and Method

### 4.1. Data

All firm-level data are retrieved from the Eikon Database. Country-level data come from the World Economic Outlook and Eikon. The scores of the cultural dimensions are from Hofstede and Minkov (2010). Furthermore, I use the trust scores by the World Values Survey (Inglehart et al., 2014). The firm-level data that I use are time series data, that is, the total debt to total assets ratio and control variables are taken from yearly data from the date range 01-01-1995 to 01-01-2015. The selected firms are all listed firms for 73 countries, subject to availability in Eikon. By using a large sample of diverse countries we can test if the results hold for countries across the globe. See Appendix 2 for a summary of country-level data.

By using primary Standard Industrial Classification (SIC) coding, I filter out financial firms (SIC 6000-6999) and regulated utilities (SIC 4900-4999). This is similar to the research by Chui et al. (2002), Frank and Goyal (2003) and de Jong et al. (2008). Common criticism is that leverage ratios of firms in these sectors are a by-product of regulation (Fama & French, 2002). This means that the leverage ratios of these firms may arise for different reasons than those of firms in other sectors. Furthermore, I delete firms that have a missing country or ISIN code as well. This brings the total amount of firms on 40,677. To correct for outliers that bias the sample I remove all firm-level variables' values outside the 1st and 99th percentile. Because these variables are ratios, they can take extremely high or negative values. Notable exception is log total assets, I do not remove outliers for this variable because any extremes are already corrected for by taking the logarithm. This way of removing outliers is called trimming and is used in many empirical studies about capital structure, including but not limited to the studies of Brav (2009) and Leary and Roberts (2005). Last, I rescale all (non-dummy) variables to have a mean of zero and a standard deviation of one. This increases comparability of variables and allows for meaningful interpretation of variables after the addition of interaction effects.

### 4.2. Variables and Measures

In order to test the hypothesis that national culture affects the capital structure of firms it is important to use the correct method, as the research involves a lot of data and variables. The first step is to clearly define and describe the variables, this is already important in the data collection process, in order to make sure all data from firms is similar.

#### *4.2.1. Dependent Variable*

There is only one main dependent variable; the firm's leverage ratio. The following definition is used for the firm's leverage ratio: (short term debt + current portion of long-term debt + long-term debt of debt)/book value of total assets. Leverage data is provided directly by Eikon. See Appendix 3 for the average debt to asset ratio for each country. Not unlike other variables, the maximum value of debt to total assets is limited at a 99th percentile. The 99th percentile value of debt to total assets is around 1.5. This is a debt to total asset ratio far above what is considered a healthy, solvable level for a company.

#### *4.2.2. Key Independent Variables*

The main important independent variables are the six Hofstede dimensions. See Appendix 4 for summary statistics under country-level variables. While Chui et al. (2002) uses the Schwartz indices and argues that Schwartz's measures are superior to the Hofstede's, there is also research showing the benefits of the Hofstede measures (Gouveia & Ros, 2000). The Hofstede indices now contain data for over 100 countries, which enables to expand the research to more countries than would be possible with the Schwartz indices. Appendix 5 shows the correlation matrix between the key variables, and other country-level variables. There is a strong negative correlation between the dimension of individualism and the dimension of power distance, which will be taken into account when running regressions.

Furthermore, I use the social trust scores of countries as measured by the World Values Survey. This allows to capture another important aspect of social capital in countries. Because no earlier research has included both Hofstede's dimensions and social trust into its analysis, it could be interesting to measure whether there is any correlation between the two within the sample of this research. If social trust is found to have a high correlation with one of the Hofstede's dimensions, it might be better to leave it out as it is unlikely to improve the results. As Appendix 5 shows, including social trust scores should not introduce problems, because the scores are not strongly correlated with Hofstede's dimensions. Note the (semi-strong) negative correlation with power distance, this makes sense; if there is a high level of trust in society people might be more in favor of sharing power with others.

In general, an important feature of my measures of national culture and cultural differences between countries is that these measures remain constant over time. While firms can change location, and thus its national culture during the 20 years sample period, these location changes are not registered by the Eikon country codes i.e.; firms only have one country code assigned for all years. This

feature of my measures has implications for my research. In particular, it is limiting the availability of applicable models of my research. A fixed effects model is unable to measure the effect of time invariant variables and is thus not possible to use if we want to capture the effect of national culture on capital structure.

#### *4.2.3. Interaction Terms*

All interaction terms that I create consist of a national culture variable multiplied with a firm-level variable. Some of the firm-level variables in this research are thus not only used as control variables but also for estimating interaction effects, see also 4.2.4. These firm-level variables are time variant. This means that, while national culture scores assigned to firms are constant, the interaction terms are in fact varying over time. As mentioned in section 4.1. all variables, including variables that are included in interaction terms, are recoded to have a mean of zero. This allows for meaningful interpretation of the main effects of which the interaction terms consist. After standardization, these main effects of the interaction terms can be interpreted as the estimated effect for when the other interacting variable is at its mean level.

#### *4.2.4. Control Variables*

All control variables are based on theoretical and empirical evidence that these variables should play a role in determining capital structure. Examples of firm-level control variables are firm size (Taub, 1975), profitability (Rajan & Zingales, 1995) and investment opportunities or the market-to-book ratio (Rajan & Zingales, 1995; Baker & Wurgler, 2002). See Appendix 4 for an overview of all variables, including control variables. The firm-level control variables are all time variant. All are financial ratios, except for firm size. The firm-level variables of liquidity, profitability and firm size are also used in interaction terms, and are thus not only used as control variables.

Firms are divided into four industry categories, by using dummies based on SIC coding. SIC 0-1999 is the primary industry, SIC 2000-2999 is manufacturing, SIC 3000-3999 is advanced manufacturing, SIC 4000-9999 is the service industry. I use control variables on a country level as well. The control variables on a country level that are used are legal system (dummies; 0 is civil law and 1 is common law) and development of the country (average GDP per capita in USD from 1995-2015). Note that using the average GDP instead of a yearly variant of GDP results in data loss. Still, it is arguably more accurate than the commonly used binary dummy to measure development (e.g. Fan et al., 2012) in capital structure research. There are slightly more firms in civil law countries than there are in common law countries, see Appendix 4. There are also firms in countries that have a combination of

law systems. For these countries the law system that is used is the system that is listed first by the CIA World Factbook. The complete list of control variables that are used including expected signs can be found in Appendix 1. Last, note that not all variables that are predicted to have an effect on capital structure can be used as control variable. One example is tax rates, because tax systems are very different across nations, we cannot take the tax rates into account as a control variable, even though it would be useful to add.

#### 4.3. Empirical Model

Multiple tests are employed. First, it is important to assess whether leverage ratios are significantly different between countries by performing an ANOVA test. If there is no significant difference in leverage ratios between countries, it is not useful to continue the research.

Second, I use OLS regressions. As independent variables, I use the cultural dimensions of Hofstede, for which every country gets assigned scores for, plus all the control variables on both a firm level and country level. The dependent variable is the debt to total assets ratio.

The basic empirical model that I estimate is as follows:

$$S_{ict} = \beta_0 + \beta_1 C_c + \beta_2 F_{it} + \varepsilon_{it} \quad (1)$$

Because of the possibility of within-country correlation, standard errors are clustered at country level. In equation (1),  $S_{ict}$  stands for the capital structure, total debt to total assets, of firm  $i$  in country  $c$  at time  $t$ .  $C_c$  are country-level predictors, including dimensions of national culture. Note that the main country-level variables, including culture, are assumed to be constant over time and are thus unrelated to  $t$ .  $F_{it}$  are time-varying firm-level variables (e.g., current ratio). Industry and year dummies are added as well. The service industry and the year of 1995 serve as reference categories, respectively.

In order to also estimate the interaction effects that I hypothesized in Chapter 3, I add an extra term to the model to measure these effects. This means that the second model takes the following form:

$$S_{ict} = \beta_0 + \beta_1 C_c + \beta_2 F_{it} + \beta_3 C_c * F_{it} + \varepsilon_{it} \quad (2)$$

$C_c * F_{it}$  measures the hypothesized interaction effects between culture and firm-level variables. This allows the model to capture moderating effects of culture on capital structure. The model is, besides the inclusion of an interaction term, similar to model of equation (1).

# Chapter 5: Results

## 5.1. Baseline Results

### 5.1.1. Direct Effects of National Culture

The first test that I perform is a test whether the average capital structure differs significantly between countries. As Appendix 3 shows, the average debt to total assets ratio differs between countries. To test whether these differences are significant, I perform an ANOVA test of equal variance. I take the country as the group variable and capital structure, expressed in total debt to total assets as the dependent variable.

Table 3  
ANOVA

Source	Sum of Squares	Degrees of Freedom	Mean Squares	F	Prob>F
Between	1042	72	14.47	350.46	0.0001
Within	19552	473,398	0.04		
Total	20594	473,470	0.043		

The results, see Table 3, show that at least one group (country) has a significantly different mean debt to total assets ratio. The ANOVA shows an intra-class correlation between countries and capital structure of .05, which I correct for, as stated in section 3.3, by using clustered data at country level. The table shows that the sum of squares between groups equals to 1,042. Meanwhile, the sum of squares within groups amounts to 19,552. This means that most of the variance in capital structure is due to differences within countries. These results are not surprising, as there are many factors besides the country factor that have been shown to impact capital structure. Furthermore, also the variable of time is regarded within groups in the results, which amounts to the large sum of squares as well for this category. The results do not suggest that we should disregard country factors in our analysis, but it is important to compare effect sizes of firm-level variables with country-level variables.

Next, I perform standard OLS regressions in accordance to equation (1). The results are shown in Table 4. Results of the first two regressions show that the dimensions of uncertainty avoidance and masculinity are statistically significant determinants of the total debt to total asset ratios of firms. The effects are in line with the hypotheses that can be found in 3.1. The later regressions (3) and (4), that include year dummies, show significant social trust scores at a 95% confidence level. This effect is also in line with its developed hypothesis. Furthermore, the inclusion of year and industry dummies also improves significance of uncertainty avoidance and masculinity.

Table 4  
The Effect of National Culture on Leverage

	(1)	(2)	(3)	(4)
	Debt to Assets	Debt to Assets	Debt to Assets	Debt to Assets
<b>Country-level Variables</b>				
Individualism	0.011 (0.19)	0.010 (0.18)	0.005 (0.08)	0.004 (0.07)
Power Distance	0.021 (0.64)	0.022 (0.66)	0.024 (0.70)	0.024 (0.72)
Uncertainty Avoidance	0.078** (2.49)	0.075** (2.52)	0.085*** (2.74)	0.083*** (2.75)
Masculinity	-0.092*** (-3.52)	-0.089*** (-3.53)	-0.093*** (-3.66)	-0.090*** (-3.68)
Long-Term Orientation	0.009 (0.26)	0.009 (0.27)	0.008 (0.22)	0.008 (0.24)
Indulgence	-0.051 (-1.20)	-0.047 (-1.16)	-0.053 (-1.22)	-0.050 (-1.19)
Social Trust	0.051* (1.91)	0.051* (1.95)	0.061** (2.26)	0.060** (2.30)
Average GDP	-0.115* (-1.93)	-0.109* (-1.94)	-0.126** (-2.07)	-0.120** (-2.09)
Law (1 = Common)	0.201** (2.28)	0.200** (2.41)	0.216** (2.53)	0.216** (2.64)
<b>Firm-level Variables</b>				
Liquidity	-0.287*** (-7.70)	-0.287*** (-7.40)	-0.281*** (-7.72)	-0.281*** (-7.45)
Profitability	-0.144*** (-5.47)	-0.145*** (-5.56)	-0.150*** (-5.63)	-0.151*** (-5.68)
Inv. Opportunities	-0.035** (-2.04)	-0.035** (-2.08)	-0.037** (-2.07)	-0.037** (-2.09)
Non-Debt Tax Shield	0.064*** (5.9)	0.061*** (6.21)	0.054*** (4.67)	0.052*** (4.87)
Firm Size	0.228*** (14.83)	0.227*** (14.74)	0.236*** (14.53)	0.234*** (14.52)
Intercept	-0.167*** (-4.20)	-0.200*** (-4.33)	-0.051 (-0.80)	-0.089 (-1.39)
Industry Dummies	No	Yes	No	Yes
Year Dummies	No	No	Yes	Yes
R <sup>2</sup>	0.191	0.193	0.198	0.201
N, Countries	73	73	73	73
N, Firm-Level Observations	216,043	216,043	216,043	216,043

Notes: t statistics in parentheses \* = p < 0.10 \*\* = p < 0.05 \*\*\* = p < 0.01. All non-dummy variables are standardized.

When excluding all cultural influences to the model the R-squared is equal to 0.181 (not reported in Table 4). After adding the factors of national culture to the model the R-squared increases to 0.191 or 0.201, depending on the inclusion of year and industry dummies. This shows that the addition of cultural factors to the model improves its fit. But, as the results of Table 3 already suggest, firm-level variables explain a much larger sum of the variance in leverage of firms than country-level variables, including culture. This means adding national culture only results in a limited improvement of goodness of fit.

Almost all of the control variables are significant at a 95% confidence level. For regression (3) and (4), all are significant. The effects are in line with predictions as summarized in Appendix 1, except for non-debt tax shield and civil-vs-common law. The sign of the latter one is interesting, as it is widely accepted that common law countries have better investor protection. It might however have to do with the fact that the sample of this research only contains firms that are listed. This means that if we would consider all firms in countries, the effect of law might be different. Fan et al. (2012) also note that this relationship between common law and leverage is only apparent in developed countries, while this sample also includes plenty of developing countries. Lastly, some countries in the sample have mixed law systems that the binary coding of dummies does not account for.

Note, that, because all variables are standardized, it is possible to compare the effects of the cultural dimensions and social trust with the effects of firm-level variables. Which have more societal significance? First, the cultural dimension that has the largest effect on capital structure is masculinity. Moving away one standard deviation from the mean causes a decrease in debt to total assets around 0.09 standard deviation from its mean. This effect on leverage is actually larger than that of some firm-level determinants, including investment opportunities (market-to-book ratio). Meanwhile, the effect of uncertainty avoidance is slightly smaller, and the effect social trust is smaller as well and only amounts to a 0.05 or 0.06 standard deviation increase in the debt to total assets ratio. These effects get overshadowed by, for example, the large effect of the firm-level variable of liquidity. Thus, if we again compare the ANOVA results of Table 3 with the OLS regression results of Table 4, both indicate that firm-level variables are of more importance than country-level variables in determining capital structure. But, cultural factors have nevertheless societal significance in determining leverage. The significance of cultural factors in determining capital structure may also be affected by the existence of moderating effects of culture. I discuss these moderating effects in section 5.1.2.

The fact that many dimensions of Hofstede, especially individualism and power distance, do not show significant effects in line with their hypotheses is puzzling. This might have to do with the large negative correlation of -0.74 between these two dimensions. Furthermore, both dimensions are

also significantly correlated with wealth (Hofstede, 2011). I show in Appendix 5 that this is also true for the sample of this research; the correlation between power distance and GDP per capita is -0.78 and the correlation between individualism and GDP per capita equals 0.67. Another reason that can particularly explain why individualism is not a significant determinant of leverage can be found in the paper of Jensen (1986). He predicts that firms in individualistically oriented countries actually increase leverage to decrease agency costs. Jensen calls this the *control hypothesis*. Debt can be a substitute for dividends, because debt can bond managers to pay out a certain level of dividends, in the form of debt (Jensen, 1986). This means that, while high levels of individualism increase the costs of debt, individualism can also lead to an increase in the benefits of debt. If these two forces work against each other, the net effect can be equal to zero. However, one would expect the effect of social trust, which is also affected by agency costs to have a net effect equal to zero as well, and this effect is still significantly in line with the hypothesis that I developed.

In conclusion, the main cultural dimensions that directly influence capital structure are masculinity and uncertainty avoidance, these results are independent of the addition of time and industry dummies. Social trust shows in the most complete regressions a significant effect of 95% confidence in line with the hypothesis as well. I reject the null hypotheses for these dimensions in favor of H2, H3 and H6. Meanwhile, individualism, power distance and long-term orientation do not show results in line with the alternative hypotheses. For these dimensions I do not reject the null hypotheses.

Besides statistical significance of masculinity, uncertainty avoidance and social trust the dimensions have also a meaningful societal effect on capital structure, although in general firm-level variables are stronger determinants of capital structure. This can also be observed by the fact that the improvement of the model fit is only limited when adding cultural factors to the model.

### 5.1.2. Moderating Effects of National Culture

In the next regressions, I add interaction terms to the model. The regressions that are performed are in line with equation (2) of the method section. See Table 5 for the results. Note that the dimensions of long-term orientation, masculinity and indulgence are included in the regressions, but not reported in Table 5 in order to focus on the dimensions that have interaction terms.

The results show that all interaction effects that are linked via pecking order theory have statistically significant effects. As the signs are negative, it means that the negative signs of liquidity and profitability become more negative as the dimension scores of uncertainty avoidance and power distance increase. This is in line with all of the hypotheses of H7.

Table 5  
Direct and Interaction Effects of National Culture on Leverage

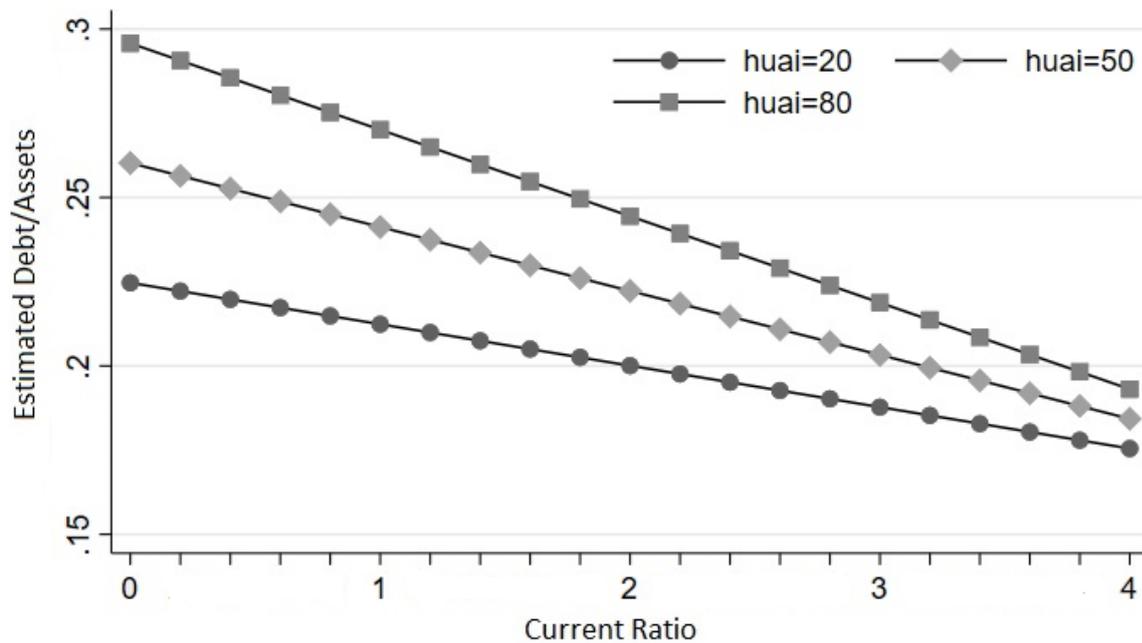
	(1)	(2)	(3)	(4)
	Debt to Assets	Debt to Assets	Debt to Assets	Debt to Assets
<b>Interaction Effects</b>				
Power Distance*	-0.071***	-0.071***	-0.071***	-0.071***
Liquidity	(-3.55)	(-3.44)	(-3.57)	(-3.47)
Power Distance*	-0.075***	-0.077***	-0.074***	-0.076***
Profitability	(-5.36)	(-5.40)	(-5.26)	(-5.29)
Uncertainty Avoidance*	-0.085***	-0.086***	-0.083***	-0.084***
Liquidity	(-4.21)	(-4.25)	(-4.24)	(-4.28)
Uncertainty Avoidance*	-0.053***	-0.052***	-0.052***	-0.052***
Profitability	(-3.11)	(-3.05)	(-3.09)	(-3.04)
Individualism*	0.008	0.004	0.008	0.005
Firm Size	(0.65)	(0.38)	(0.70)	(0.46)
Social Trust*	0.006	0.005	0.008	0.007
Firm Size	(0.33)	(0.27)	(0.41)	(0.35)
<b>Country-Level Variables</b>				
Individualism	0.002	0.002	-0.004	-0.004
	(0.04)	(0.04)	(-0.07)	(-0.07)
Power Distance	0.0196	0.0203	0.022	0.0225
	(0.55)	(0.58)	(0.60)	(0.62)
Uncertainty Avoidance	0.075**	0.073**	0.083**	0.080**
	(2.29)	(2.28)	(2.54)	(2.52)
Social Trust	0.052*	0.052*	0.060*	0.060**
	(1.70)	(1.73)	(1.99)	(2.01)
<b>Firm-Level Variables</b>				
Liquidity	-0.330***	-0.329***	-0.323***	-0.323***
	(-14.88)	(-14.10)	(-15.00)	(-14.29)
Profitability	-0.180***	-0.182***	-0.186***	-0.188***
	(-10.33)	(-10.58)	(-10.44)	(-10.63)
Firm Size	0.217***	0.217***	0.224***	0.224***
	(13.61)	(13.55)	(13.19)	(13.18)
Intercept	-0.164***	-0.195***	-0.054	-0.091
	(-3.89)	(-4.04)	(-0.86)	(-1.42)
Industry Dummies	No	Yes	No	Yes
Year Dummies	No	No	Yes	Yes
R <sup>2</sup>	0.192	0.195	0.199	0.202
N, Countries	73	73	73	73
N, Firm-Level Observations	216,043	216,043	216,043	216,043

Notes: t statistics in parentheses \* = p < 0.10 \*\* = p < 0.05 \*\*\* = p < 0.01. All non-dummy variables are standardized. Long-term orientation, masculinity and indulgence and all control variables are included in the regressions but not all are reported.

Overall, the strongest effect in all four regressions is between uncertainty avoidance and liquidity. The effect is about -0.085. The significant interaction effects remain also significant in all four regressions, only varying slightly. An effect equal to -0.085 is actually quite strong. It means that, when uncertainty avoidance is at its mean, moving one standard deviation up for liquidity yields an effect of -0.33, it does vary between -0.245 and -0.415, if we allow uncertainty avoidance to deviate one standard deviation away from its mean. The interaction effect between the cultural dimensions and power distance is arguably even larger as the effect of profitability with average levels of the cultural dimensions is smaller than that of liquidity, meaning that the deviations of the dimensions from this average will have a relatively larger impact on the effect size of the firm-level variable on leverage. Interaction effects related to pecking order theory show thus both statistical and societal significant effects on leverage.

The R-Squared values as reported in Table 5 are only slightly higher than the values of the regressions of the direct effects of Table 4. This shows that, while the addition of interaction effect clearly yields statistically significant results, the inclusion of interaction effects in my model does not improve the fit of the model to any meaningful extent.

Graph 1  
Interaction Effect between Uncertainty Avoidance and Liquidity



See Graph 1 on the previous page for a graphical representation of the interaction effect between uncertainty avoidance and liquidity. The graph clearly shows that, while uncertainty avoidance itself is associated with a higher level of leverage, the interaction with liquidity (current ratio) causes the negative slope to become steeper when the level of uncertainty avoidance increases. This means that an increase in current ratio from 0 to 4 results in a much larger drop in estimated leverage ratio for firms located in countries with a large uncertainty avoidance. All of the interaction effects are graphically reported, and can be found in Appendix 6.

The interaction effects that I relate to agency costs/tradeoff theory do not only show very weak effects, they are also statistically insignificant, this means I cannot reject the null hypotheses in favor of both H8 hypotheses; high levels of social trust, or low levels of individualism, do not weaken the effect of firm size on capital structure. Firm size itself remains a significant determinant of leverage.

In conclusion, the results of Table 5 and the graphs show that there are in fact significant interaction effects between culture and firm-level variables. These effects sizes show societal significance. However, this is not reflected by the R-squared values as the model fit does not improve after the addition of interaction terms. Furthermore, note that not all interaction terms show significant effects, in fact I cannot reject the null hypotheses in favor of both the hypotheses of H8. Still, as I have only tested for a few interaction effects, it is reasonable to assume that are more interaction effects available, which can be of interest for future research.

## 5.2. Robustness Checks

There are several robustness checks that can be performed. As Appendix 3 already shows, some countries have a really small amount of observations. This means that the observations might not be a representative sample of the country's financial ratios. Furthermore, the method that I use for clustering data requires a roughly similar sample size for all groups (countries) in order to be unbiased (Rogers, 1993). This means it is useful to have a robustness check with a sample that excludes countries that have a small amount of firms. I perform regressions while removing countries having less than 20, 50, 100 firms in its sample. This is similar to the methodology of Chui et al. (2002), in which countries that have less than 20 firms are removed. Using these edited samples, I perform regressions, see regression (1), (2) and (3) of Table 6, similar to regressions of Table 5. This time, I will focus on both direct and moderating effects and thus report all variables.

Results show that uncertainty avoidance and masculinity again have significant signs in line with the hypotheses. The same is true for social trust, although social trust is only significant at a 90% confidence level. Meanwhile, other cultural dimensions remain insignificant.

Table 6

**Robustness Checks: Exclusion of countries with small sample size, or exclusion of Hong Kong**

Countries removed from sample:	(1) Firms<20	(2) Firms<50	(3) Firms<100	(4) Hong Kong
<b>Interaction Effects</b>				
Power Distance*	-0.071***	-0.072***	-0.074***	-0.071***
Liquidity	(-3.47)	(-3.49)	(-3.50)	(-3.24)
Power Distance*	-0.076***	-0.076***	-0.079***	-0.081***
Profitability	(-5.29)	(-5.25)	(-5.53)	(-5.46)
Uncertainty Avoidance*	-0.084***	-0.086***	-0.089***	-0.077***
Liquidity	(-4.28)	(-4.32)	(-4.52)	(-3.81)
Uncertainty Avoidance*	-0.052***	-0.052***	-0.054***	-0.049***
Profitability	(-3.04)	(-3.01)	(-3.18)	(-2.71)
Individualism*	0.005	0.006	0.005	0.004
Firm Size	(0.45)	(0.48)	(0.38)	(0.28)
Social Trust*	0.007	0.007	0.006	-0.003
Firm Size	(0.35)	(0.35)	(0.30)	(-0.16)
<b>Country-Level Variables</b>				
Individualism	-0.004	-0.003	-0.005	-0.068*
	(-0.06)	(-0.06)	(-0.09)	(-1.68)
Power Distance	0.022	0.021	0.022	0.014
	(0.62)	(0.59)	(0.58)	(0.38)
Uncertainty Avoidance	0.080**	0.081**	0.083**	0.066**
	(2.50)	(2.48)	(2.50)	(2.37)
Masculinity	-0.088***	-0.085***	-0.085***	-0.081***
	(-3.31)	(-3.19)	(-3.09)	(-3.77)
Long Term Orientation	0.009	0.010	0.006	-0.034
	(0.27)	(0.30)	(0.18)	(-1.16)
Indulgence	-0.044	-0.042	-0.039	-0.109***
	(-1.04)	(-0.99)	(-0.92)	(-2.90)
Social Trust	0.060*	0.060*	0.059*	0.068**
	(2.00)	(1.98)	(1.92)	(2.33)
Average GDP	-0.126**	-0.129**	-0.131**	-0.058
	(-2.12)	(-2.13)	(-2.15)	(-1.62)
Law (1 = Common)	0.215**	0.217**	0.212**	0.264***
	(2.57)	(2.57)	(2.49)	(3.53)
<b>Firm-Level Variables</b>				
Liquidity	-0.323***	-0.323***	-0.324***	-0.324***
	(-14.28)	(-14.32)	(-14.49)	(-13.54)
Profitability	-0.188***	-0.187***	-0.189***	-0.190***
	(-10.62)	(-10.53)	(-10.71)	(-10.37)
Inv. Opportunities	-0.031*	-0.032*	-0.032**	-0.033**
	(-1.96)	(-1.99)	(-2.03)	(-2.02)
Non-Debt Tax Shield	0.052***	0.053***	0.053***	0.054***
	(4.93)	(4.98)	(4.95)	(5.10)
Firm Size	0.224***	0.224***	0.224***	0.227***
	(13.17)	(13.13)	(12.98)	(13.11)
Intercept	-0.091	-0.093	-0.091	-0.097*
	(-1.42)	(-1.44)	(-1.39)	(-1.67)
Industry & Year Dummies	Yes	Yes	Yes	Yes
R <sup>2</sup>	0.214	0.214	0.216	0.222
N, Countries	59	50	43	72
N, Firm-Level Observations	215,959	215,098	212,995	205,867

Notes: t statistics in parentheses \* = p < 0.10 \*\* = p < 0.05 \*\*\* = p < 0.01. All non-dummy variables are standardized.

The interaction effects are in line with the results of Table 5 as well. That is; the interaction effects of power distance and uncertainty avoidance with firm-level variables remain significant, and the interaction effects of individualism and social trust remain insignificant. The results of the regressions show that the results hold and remain similar in size when countries with a small amount of firms are removed from the sample. This is especially true for interaction effects, which stay significant at a 99% confidence level. Furthermore, goodness of fit slightly improves after deleting countries with a smaller amount of firms in the sample. This suggests that the hypothesis of Chui et al. (2002), which states that countries with a small sample size may display financial ratios that are not representative of the country, is at least partly true.

For the next robustness check, see regression (4), I delete Hong Kong from the sample, as many firms listed under Hong Kong are, according to their ISIN codes, registered at the Cayman Islands. This means that firms listed in Hong Kong might not actually have anything to do with Hong Kong. This is problematic because in the dataset, these firms are still listed with the cultural dimension and social trust scores of Hong Kong. In fact, removing Hong Kong from the sample might actually improve significance of effects. In Table 6 the results are shown. Most parameters have signs similar to the results of Table 5 and to the results of the other robustness checks. There are a few noteworthy differences, however. First of all, individualism becomes significant at a 90% level when Hong Kong is excluded. This is interesting because no significant effect has been found for individualism in previous regressions. Furthermore, social trust becomes significant at a 95% confidence level. Meanwhile, the control variable that has been shown to correlate with individualism, average GDP, becomes insignificant. Overall, it is interesting that the removal of one country from the sample yields these differences. This suggests that the Cayman Islands-registered firms of Hong Kong do actually have some impact on the overall results. This is supported by the fact that the R-squared of the model improves by quite a lot as well after removing only one country from the sample.

## Chapter 6: Discussion and Conclusion

### 6.1. Discussion

This research seeks to find the cultural determinants of capital structure. In addition to previous research, some adaptations have been made. In particular the addition of social trust as a determinant of capital structure, and the inclusion of interaction effects with Hofstede's cultural dimensions are noteworthy adaptations. Finally, there are a few important points that need addressing, before moving on to the conclusion.

First, this research aims to include a sample that is as complete as possible, with countries of all continents. Previous research, in particular the studies by Gleason et al. (2000) and Chui et al. (2002) have a relatively small country sample. This can potentially be problematic for properly determining the effect of culture on capital structure. E.g. by including only a few developing countries, the sample likely lacks countries with high power distance and low individualism. This is because wealth is shown to correlate with these cultural dimensions (Hofstede, 2011).

Above information does not imply, however, that the sample of this research is perfect. In fact, after filtering for outliers and missing data, there is especially a small amount of countries from the African continent. In addition, there is also a very small amount of firms for some countries. This on itself can be problematic too. If a single cluster is larger than 5% of the total sample, standard error correction for intra class correlation can impose a bias (Rogers, 1993). In my sample, country sample sizes vary by large amounts. This means the correction of the standard error may be biased. However, the robustness checks of removing countries with small sample sizes create more balanced group sizes. Hopefully, future research is able to include more countries from the African continent and it is able to include more firms per country in order to create a more complete and representative sample.

The use of the Hofstede cultural dimensions, instead of another cultural orientation (Schwartz), is partly an arbitrary choice. Because there are more countries available for the Hofstede indices, it is reasonable to use the Hofstede index, as it enables this research to use more countries. Also, because the study by Chui et al. (2002) uses the Schwartz dimensions, it makes my research more interesting by using alternative measurements. One main problem with Hofstede's theory is that it uses culture-level dimensions (Schwartz, 1994). According to Schwartz, these culture-level dimensions must be derived from nation means and thus cannot be observed from individual behavior. Actually, when analyzing the dimensions of power distance and individualism dimensions on an individual level, the dimensions did not emerge (Hofstede, 1980; Schwartz, 1994). This, of course, raises the question how accurately Hofstede's dimensions can be used to explain the behavior of individuals.

This paper uses a pooled OLS model to estimate the effects of culture on capital structure. Because the cultural determinants of this research remain constant over time, the fixed effect model is not appropriate to use. This is because a fixed effects model only uses the within variance for its estimation (Woolridge, 2002), meaning this particular model cannot measure the effect of constant variables. The use of a random effects model is possible. While, technically, the sample measures the same economic entities through time, the sample differs substantially every year as firms come and go. Another alternative is using a mixed model, e.g. the HLM model. The main drawback of these models is that the employment of these models is complicated and time consuming. The main drawback of using a pooled OLS model is that the question of the whether cross-firm differences account for the variation remains unanswered (Podestà, 2002). In other words, OLS assumes no cross-sectional heterogeneity. This is because the pooled OLS model creates a common intercept for all cross-sectional units. While this is not a very realistic assumption, Pooled OLS remains an often used empirical framework in literature on the topic, and has a close fit with the data used in this paper.

In general, pooled OLS models tend to impose the following problems (Podestà, 2002): First, there is risk of serial correlation, because every time period is treated independently. Second, errors can be correlated across nations. Third, errors tend to be heteroscedastic between countries. Fourth, errors can be concealing unit and period effects. Last, errors might be nonrandom across spatial and temporal units. By correcting for errors clustered at country-level I tackle the second and third problems as discussed by Podestà. However, this is imperfect, e.g. countries may be clustered as well, for example errors from Scandinavian countries may show correlation beyond the country-level. Another cluster level for which I control is industry, by including industry effects. Lastly, I also control for year effects by including time dummies to the regression. However, results seem to be rather stable, regardless of addition of time or industry dummies.

One of the biggest challenges of this paper remains the fact that the cultural dimensions of individualism, power distance and long-term orientation do not show a significant effect on leverage. This is puzzling, because ex-ante theorizing revealed clear reason to expect these cultural dimensions to affect capital structure. Empirically, these findings of my research do also not align with those of Wang and Esqueda (2014). Although this might be caused by the fact that the sample used in the research of Wang and Esqueda is very different, and consists only of ADRs in developing countries. Jensen's (1986) so-called *control hypothesis* might be able to explain why individualism is not found to be a significant determinant of leverage. As stated in Chapter 5; firms can actually benefit from raising debt in order to decrease agency costs. This force can work against my predicted effect, leading to a net effect of zero. The main reason why power distance is not a significant determinant of capital

structure might have to do with forces creating a net effect of zero as well. While information asymmetry caused by power distance leads to an increase in leverage according to pecking order theory, the agency theory predicts a negative effect of power distance on leverage. In this way, the net effect will be zero. The regression with exclusion of Hong Kong provides some evidence that individualism is in fact a determinant of capital structure, as it becomes significant at 90%. One final explanation for why some dimensions do not show significant effects is because of the problem of culture-level measurement of Hofstede's dimensions, as stated before in the notes.

## 6.2. Conclusion

This research shows that national culture affects the capital structure of firms. The Hofstede cultural dimension of masculinity has a significant negative effect on leverage. Meanwhile, the dimension of uncertainty avoidance and social trust have a significant positive effect on leverage. All these effects are in line with the alternative hypotheses, which allows for rejecting the null hypotheses for the direct effects of these dimensions. The dimensions of individualism, power distance and long-term orientation do not display stable and statistically significant effects on leverage.

Besides direct effects, this research also takes into account moderating effects by addition of interaction terms into the empirical regressions. The results of this are promising, because little evidence has been found on the existence of these effects. The significant interaction effects that have been found are effects between uncertainty avoidance and the firm-level variables of liquidity and profitability. Similar effects have been found between power distance and these firm-level variables. These results show robustness as well. There have been found no significant interaction effects between individualism and social trust with firm size.

When comparing the direct effect sizes of these cultural variables with firm-level variables, it becomes clear that most firm-level variables play a much larger role in determining leverage. However, I show that culture can affect capital structure in two ways; via direct effects and moderating effects, although the particular moderating effects that I include do not strongly improve the model fit.

The results give a clear indication that further research on the determinants of capital structure can benefit from including a cultural component. Furthermore, this research suggests that agency and pecking order theory are in fact useful theories to explain the link between national culture and capital structure. For future research, I suggest researching into the mechanisms of the moderating effects of national culture on capital structure. In particular, it is interesting to see if there can be found evidence on the existence of moderating effects that are theoretically linked with agency theory, as this research did not find evidence for these effects.

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## Appendices

### Appendix 1 (Control) Variables and Expected Effects

Variable	Expressed as	Expected Effect on Leverage	Supporting Research
<b>Firm-Level Variables</b>			
Firm Size	Log Total Assets in USD	+ +	T: Scott Jr. (1976) E: Taub (1975)
Firm Profitability	Operating Income/Total Capital	- -	T: Pecking Order Theory E: Rajan & Zingales (1995)*
Investment Opportunities	Market-to-Book Ratio	- -	T: Pecking Order Theory E: Baker & Wurgler (2002)
Non Debt Tax Shield	Depreciation/Total Assets	- -	T: Trade off Theory E: Deesomsak et al. (2004)
Liquidity	Current Assets/Current Liabilities	- -	T: Pecking Order Theory E: Deesomsak et al. (2004)
<b>Country-Level Variables</b>			
Country's Development	GDP/Capita	-	E: Bokpin (2009)
Legal System	Common instead of Civil	+	E: Fan et al. (2012)

+ = positive, - = negative, T = theoretical support, E = empirical support \*Rajan and Zingales (1995) use EBITDA/Book Value of Assets, Operating Income is used for simplicity and data availability purposes.

Appendix 2  
Country-Level Data

COUNTRY	PDI	IND	MAS	UAV	LTO	IDL	TRS	GDP	LAW	COUNTRY	PDI	IND	MAS	UAV	LTO	IDL	TRS	GDP	LAW
Argentina	49	46	56	86	20	62	20	9011	CIV	Luxembourg	40	60	50	70	64	56	25	82029	CIV
Australia	36	90	61	51	21	71	45	39361	COM	Malaysia	104	26	50	36	41	57	9	6828	COM
Austria	11	55	79	70	60	63	33	38685	CIV	Malta	56	59	47	96	47	66	19	16734	COM
Belgium	65	75	54	94	82	57	31	36342	CIV	Mexico	81	30	69	82	24	97	24	7978	CIV
Brazil	69	38	49	76	44	59	6	7046	CIV	Morocco	70	46	53	68	14	25	19	2257	CIV
Bulgaria	70	30	40	85	69	16	27	4495	CIV	NL	38	80	14	53	67	68	51	40495	CIV
Canada	39	80	52	48	36	68	44	35899	COM	N. Zealand	22	79	58	49	33	75	50	26799	COM
Chile	63	23	28	86	31	68	20	9119	CIV	Nigeria	80	30	60	55	13	84	22	1752	COM
China	80	20	66	30	87	24	54	3234	CIV	Norway	31	69	8	50	35	55	66	65551	CIV
Taiwan	58	17	45	69	93	49	30	20093	CIV	Pakistan	55	14	50	70	50	0	27	901	COM
Colombia	67	13	64	80	13	83	12	4508	CIV	Peru	64	16	42	87	25	46	8	3743	CIV
Croatia	73	33	40	80	58	33	23	9917	CIV	Philippines	94	32	64	44	27	42	7	1708	CIV
Cyprus						70	13	23358	COM	Poland	68	60	64	93	38	29	23	8825	CIV
Czechia	57	58	57	74	70	29	27	13634	CIV	Portugal	63	27	31	104	28	33	17	17688	CIV
Denmark	18	74	16	23	35	70	59	47508	CIV	Romania	90	30	42	90	52	20	17	5530	CIV
Estonia	40	60	30	60	82	16	24	11068	CIV	Russia	93	39	36	95	81	20	28	7285	CIV
Finland	33	63	26	59	38	57	56	38038	CIV	S. Arabia	95	25	60	80	36	52	53	15015	CIV
France	68	71	43	86	63	48	22	35132	CIV	Serbia	86	25	43	92	52	28	0	4053	CIV
Germany	35	67	66	65	83	40	34	36335	CIV	Singapore	74	20	48	8	72	46	15	36300	COM
Ghana	80	15	40	65	4	72	9	1016	COM	Slovakia	100	52	100	51	77	28	21	10779	CIV
Greece	60	35	57	112	45	50	24	20005	CIV	Vietnam	70	20	40	30	57	35	48	982	CIV
Guatemala	95	6	37	101			16	2376	CIV	Slovenia	71	27	19	88	49	48	18	17966	CIV
Hong Kong	68	25	57	29	61	17	41	30228	COM	S. Africa	49	65	63	49	34	63	20	5018	CIV
Hungary	46	80	88	82	58	31	27	9871	CIV	Spain	57	51	42	86	48	44	33	24079	CIV
Iceland	30	60	10	50	28	67	41	42756	CIV	Sweden	31	71	5	29	53	78	63	43217	CIV
India	77	48	56	40	51	26	35	934	COM	Switzerland	34	68	70	58	74	66	44	60988	CIV
Indonesia	78	14	46	48	62	38	46	2066	CIV	Thailand	64	20	34	64	32	45	42	3751	CIV
Iraq	95	30	70	85	25	17	44	4097	CIV	Turkey	66	37	45	85	46	49	11	7531	CIV
Ireland	28	70	68	35	24	65	41	43213	COM	Uganda					24	52	8	479	COM
Israel	13	54	47	81	38		23	25575	COM	Ukraine	92	25	27	95	55	18	29	2059	CIV
Italy	50	76	70	75	61	30	32	29609	CIV	Macedonia					62	35	11	3484	CIV
Jamaica	45	39	68	13			0	4120	COM	Egypt	70	25	45	80	7	4	28	2137	CIV
Japan	54	46	95	92	88	42	42	38378	CIV	UK	35	89	66	35	51	69	36	36743	COM
Jordan	70	30	45	65	16	43	29	3126	CIV	USA	40	91	62	46	26	68	41	43439	COM
S. Korea	60	18	39	85	100	29	32	18290	CIV	Venezuela	81	12	73	76	16	100	15	6473	CIV
Latvia	44	70	9	63	69	13	21	8744	CIV	Zimbabwe	60	35	40	50	30	42		824	COM
Lithuania	42	60	19	65	82	16	26	8867	CIV	AVG	60	45	49	66	48	47	29	18322	

PDI=Power Distance, IND=Indulgence, MAS=Masculinity, UAV=Uncertainty Avoidance, LTO=Long-Term Orientation, IDL= Indulgence, TRS=Trust Score, GDP=Avg. GDP Per Capita, LAW=Legal Origin

Appendix 3

Debt to Assets Ratios, per Country (after removing outliers at 99<sup>th</sup> percentile level)

COUNTRY	MEAN	STD	N OBS	COUNTRY	MEAN	STD	N OBS
<i>Argentina</i>	21.20	19.19	1138	<i>Luxembourg</i>	20.43	20.64	334
<i>Australia</i>	13.49	19.92	22,083	<i>Malaysia</i>	21.85	19.77	14,285
<i>Austria</i>	24.98	18.08	1,345	<i>Malta</i>	25.66	17.51	125
<i>Belgium</i>	24.27	18.67	2,074	<i>Mexico</i>	23.77	18.02	2,115
<i>Brazil</i>	16.92	21.71	1,967	<i>Morocco</i>	16.67	15.74	644
<i>Bulgaria</i>	27.42	20.90	4,723	<i>Netherlands</i>	22.91	18.17	2,656
<i>Canada</i>	14.34	21.55	33,036	<i>New Zealand</i>	22.46	19.37	1,694
<i>Chile</i>	20.15	16.15	2,470	<i>Nigeria</i>	22.40	21.13	654
<i>China</i>	24.07	18.18	31,357	<i>Norway</i>	29.61	23.95	3,385
<i>Taiwan</i>	20.99	17.37	24,088	<i>Pakistan</i>	33.50	24.96	3,138
<i>Colombia</i>	12.57	12.06	678	<i>Peru</i>	21.57	18.44	1,510
<i>Croatia</i>	19.94	18.60	919	<i>Philippines</i>	20.41	22.38	2,658
<i>Cyprus</i>	29.83	20.12	681	<i>Poland</i>	17.87	17.13	4,894
<i>Czechia</i>	19.75	16.67	388	<i>Portugal</i>	34.83	20.60	1,218
<i>Denmark</i>	24.28	19.26	2,573	<i>Romania</i>	15.44	19.00	1,293
<i>Estonia</i>	21.87	18.20	142	<i>Russia</i>	25.98	23.55	4,735
<i>Finland</i>	25.24	17.54	2,419	<i>Saudi Arabia</i>	19.45	19.01	1,209
<i>France</i>	20.80	17.28	14,009	<i>Serbia</i>	19.68	18.85	905
<i>Germany</i>	19.86	19.95	12,949	<i>Singapore</i>	20.90	18.38	9,230
<i>Ghana</i>	22.94	25.56	153	<i>Slovakia</i>	18.00	17.10	256
<i>Greece</i>	29.32	21.27	4,553	<i>Vietnam</i>	24.97	20.73	5,459
<i>Guatemala</i>	16.48	10.35	22	<i>Slovenia</i>	17.30	17.83	5,502
<i>Hong Kong</i>	19.35	19.19	14,378	<i>South Africa</i>	24.97	18.04	437
<i>Hungary</i>	16.54	15.01	520	<i>Spain</i>	26.62	19.87	2,342
<i>Iceland</i>	40.68	14.33	150	<i>Sweden</i>	17.28	18.12	6,786
<i>India</i>	30.96	23.32	26,256	<i>Switzerland</i>	21.68	17.80	3,575
<i>Indonesia</i>	30.85	26.20	5,799	<i>Thailand</i>	29.30	25.14	7,797
<i>Iraq</i>	7.67	23.87	79	<i>Turkey</i>	23.17	21.70	4,057
<i>Ireland</i>	21.27	21.23	1,057	<i>Uganda</i>	17.56	17.16	22
<i>Israel</i>	27.35	23.57	4,388	<i>Ukraine</i>	19.75	20.08	673
<i>Italy</i>	27.29	17.85	4,001	<i>Macedonia</i>	20.14	18.23	259
<i>Jamaica</i>	2.42	1.21	7	<i>Egypt</i>	17.71	19.57	1,601
<i>Japan</i>	23.44	20.22	68,113	<i>UK</i>	17.75	19.84	29,240
<i>Jordan</i>	17.57	17.70	1,301	<i>United States</i>	21.21	22.48	34,389
<i>South Korea</i>	25.79	20.38	23,480	<i>Venezuela</i>	13.41	11.69	317
<i>Latvia</i>	19.17	18.29	298	<i>Zimbabwe</i>	8.98	9.16	207
<i>Lithuania</i>	27.35	19.50	277	<i>Total AVG</i>	22.01	20.86	6,486

Appendix 4

**Descriptive Statistics (after removing outliers at 99<sup>th</sup> percentile level)**

Variable	Obs	Mean	Std. Dev.	Min	Max
<b>Firm-Level</b>					
Debt to Total Assets	473,471	0.22	0.21	0	1.36
Current Ratio	464,840	2.49	3.33	0.07	34
Income to Capital	424,067	3.89	26.59	-194.88	73.81
Depreciation to Total Assets	264,637	0.03	0.03	0	0.16
Market to Book Value	518,394	1.95	2.76	-8.86	26.13
Log Total Assets	482,587	11.57	2.26	0	28.53
<b>Country-Level</b>					
Power Distance	851,025	55.88	19.41	11	104
Individualism	851,025	52.71	26.92	6	91
Masculinity	851,025	57.08	18.66	5	100
Uncertainty Avoidance	851,025	58.15	23.80	8	112
Long-Term Orientation	851,529	57.70	24.87	4	100
Indulgence	844,011	48.33	18.83	0	100
Social Trust	852,726	36.41	12.20	0	66
Avg. GDP/Capita	853,335	25220.67	16223.84	479.1991	82028.83
Common Law	853,335	0.44	0.50	0	1
Primary	853,335	0.19			
Manufacturing	853,335	0.19			
Adv. Manufacturing	853,335	0.28			
Service	853,335	0.34			

Appendix 5

**Correlation Table of Country-Level Variables (after removing outliers at 99<sup>th</sup> percentile level)**

	PDI	IDV	MAS	UAI	LTO	IVR	TRUST
PDI							
IDV	-0.74						
MAS	-0.06	0.12					
UAI	0.05	-0.19	0.22				
LTO	0.26	-0.56	0.24	0.34			
IVR	-0.64	0.7	-0.06	-0.2	-0.55		
TRUST	-0.42	0.25	0.07	-0.28	0.05	0.09	
GDP	-0.78	0.67	0.19	0.04	-0.10	0.59	0.34
LAW	-0.23	0.52	0.02	-0.61	-0.59	0.39	0.03

## Appendix 6

### Graphical Representation of Interaction Effects between Cultural and Firm-Level Variables

