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Country-specific influences on corporate capital structure: A comparison between different country-categorization groups

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This study analyzes the differences in the debt-to-equity ratio between different country-categorizations over the period 1990-2016 using a dynamic panel approach with aggregate firm-level data. The main results suggest that companies located in countries with Bank-based financial systems and Civil-law legal systems are more likely to have higher debt-to-equity ratios than companies located in Market-based financial systems and Common-law countries. These findings are mainly due to the higher size of the stock market in relation to the size of the banking sector in these countries. The results also show that countries with high scores on the cultural dimensions of Power Distance, and Masculinity tend to have lower debt-to-equity ratios. However, the differences between the country groups diminish as time progresses.

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1. Introduction

How do companies choose their capital structure? Is this choice influenced by the level of development of a country? What role do institutional and cultural characteristics of a country play in this choice? These questions are important because prior research shows that the capital structure of a company is largely influenced by country-specific factors (e.g., Demirgüç-Kunt and Maksimovic, 1999; Booth et al., 2001). Knowledge of the direction and impact of these factors can be useful for companies, policymakers and investors in shaping their responses to specific situations. For example, companies in debt-dependent countries are affected more by shocks in the supply of debts in the economy or any sustained inflationary pressures, than companies in more equity-dependent countries (Baxamusa and Jalal, 2014). Companies can use this information to make effective capital structure decisions for financial stability and sustainable growth (Mokhova and Zinecker, 2013). Investors can exploit the findings of this study to form appropriately diversified portfolios, and policymakers may adopt policies that facilitate robust financial markets and institutions.

This study provides an international comparison of the capital structure between the following country-categorizations:

1) Development: Developed vs. Developing
2) Financial system: Bank-based vs. Market-based
3) Legal system: Common-law vs. Civil-law
4) Religion: Christian vs. Islam
5) Culture: Culture clusters one vs. Culture cluster two

This research aims to provide insight into two important questions. Firstly, are there any systematic differences in the leverage ratio between different country-categorization groups? Secondly, what are the underlying country-specific determinants of the country-categorizations and how do they relate to leverage?

There are studies that are directly comparing the differences in capital structures between the country-categorizations groups. However, the current literature is either limited (e.g. development, legal system, religion and culture) or non-existing (in case of the financial system). This study sheds further light on the limitations and provides to fill the gap existing in the literature. Besides, the current literature investigate these differences between the country-categorizations separately.

This study brings the country-categorizations together. This also gives the possibility to include interactions between the categorization groups, which gives an even greater international comparison. Moreover, this is the first study that investigates how Human Development Index (HDI) relates to leverage, which gives a more complete measurement of the development of a country than Gross Domestic Product (GDP) alone. Finally, the sample in this study includes data until 2016, while most previous studies focus on a sample until the early 2000s.

This study encompasses a large number of countries (40 in total), from every continent for the period 1990-2016. Permutation tests and (dynamic) panel approaches with aggregate firm-level data from more than 36,000 firms are used for the analysis. Table 1 provides a literature overview, and the findings of this study, with regard to the differences in the leverage ratio between the country-categorization groups. In addition to this, table 1 also contains a large number of country-specific variables that represent the underlying determinants of the country-categorization and shows how they are related to leverage.

TABLE 1. COUNTRY CATEGORISATION AND COUNTRY-SPECIFIC VARIABLES: LITERATURE REVIEW

Country-Categorization	Hypothesis 1 Differences between Country-categorization groups 2 Country-specific Determinants of capital structure		Empirical evidence	Findings literature	Expected	Findings this study
Development	1a	Developed vs. Developing	Chui et al., 2002	>	>	>
	2a	GDP per capita	Chui et al., 2002 / de Jong, Kabir, Nguyen, 2008	+	-	-
			Bokpin, 2009 / Dincergok & Yalciner 2011	-		
		Human Development Index		.	-	-*
Fin. System	1b	Bank-based vs. Market-based		.	>	>*
	2b	Stock market development				
		(market capitalization)	Agarwal and Mohtadi, 2004 / Mutenheri and Green, 2003	-	-	-*
			Demirgüç-Kunt and Maksimovic, 1996 / Sett and Sarkhel, 2010			
			Bokpin, 2009 / de Jong, Kabir, Nguyen, 2008	/		
			Demirgüç-Kunt and Maksimovic, 1996 / Gajurel, 2006	+		
		(Value traded)	Agarwal & Mohtadi, 2004	/	-	+*
		(Turnover)	Agarwal & Mohtadi, 2004	/	-	+*
		Bank sector development	Agarwal & Mohtadi, 2004 / Bokpin, 2009	+	+	+*
			Sett, K., & Sarkhel, J., 2010 / de Jong, Kabir, Nguyen, 2008			
Legal system	1c 1	Common-law vs. Civil-law	Chui et al., (2002), La Porta et al. (1997)	>	>	>*
	2	German/Scandivian vs. French Civil-law	Chui et al., (2002), La Porta et al. (1997)	>	>	>*
	2c	Shareholder right protection	Jiraporn & Gleason, 2007	-	-	-/+
		Creditor right protection	La Porta et al., 1997	+	+	-
Religion	1d 1	Christian vs. Islam		.	>	>
	2	Catholic vs. Protestant	Baxamusa and Jalal, 2014	>	>	>
	2d	Catholic Religiosity	Baxamusa and Jalal, 2014	+	+	+
		Protestant Religiosity	Baxamusa and Jalal, 2014	-	-	-
		Islamic Religiosity			-	+
Culture	1e	Culture clusters one vs. Culture cluster two		.	>	>
	2e	Individualism	Wang and Esquesa, 2014 / Gray et al., 2013	+	+	-
			Mac and Lucey, 2010	-		
		Power distance	Wang and Esqueda, 2014 / Arosa et al., 2014	-	-	-*
		Masculinity	Chui et al. 2002 / Wang and Esquesa, 2014	-	-	-*
		Uncertainty avoidance	Chui et al., 2002 / Wang and Esquesa, 2014 / Arosa et al. 2014	-	-	+

Notes: > the first country-categorization group has a higher debt-to-equity ratio, + positive influence on leverage, - negative influence on leverage, / no influence on leverage, . no current literature. Expected reports the expectations based on the majority of the empirical reports and the theories * reports whether the signs of the findings in this study are significant.

The results imply that Bank-based countries have significant higher debt-to-equity ratios than Market-based countries and that Civil-law countries have significantly higher debt-to-equity ratios than Common-law countries. When interactions are included between the various country-categorization groups, it shows that countries with a culture characterized by high Individualism and low Power Distance, also have significantly higher leverage ratios than cultures with low Individualism and low Power Distance. It is notable that especially in these country-categorization groups the leverage ratios decreases as time progresses, with as a result converging leverage ratios over time.

When analyzing the impact of the country-specific variables on leverage, the evidence generally suggests that HDI, the size of the stock market (as measured by market capitalization to GDP), Power Distance, and Masculinity have a significant negative impact on leverage. While the bank-sector variables (as measured by bank deposits and bank credit to GDP) and the efficiency of the stock market (as measured by turnover ratio) have a significant positive impact on leverage. Moreover, the activity of the stock market (as measured by the value traded) is also significantly positively related to leverage in a sample with only developed countries. This indicates that the development of a country, institutional factors and cultural factors affect the leverage ratios in nations. However, the results suggest that the development of the financial markets seem to be of first-order.

The rest of this study is organized as following. Section 2 presents the theoretical background on the differences in leverage between the country-categorization groups and provides a literature review of the underlying country-specific determinants of the country-categorizations. Section 3 describes the research design, the methodology and the variable selection. Section 4 represents the empirical results of the research including the basic statistics, permutation tests and panel regression analysis. Section 5 concludes this study.

2. Literature review

The first section of the literature review discusses the theory on leverage. The second section discusses the theoretical and empirical studies on the differences between country-categorization groups, and the country-specific factors that represent the underlying determinants of a specific country-categorization group. Moreover, this section includes the hypotheses per country-categorization. The last section discusses interactions between the country-categorization groups.

2.1. Theories on leverage

Since the seminal paper by Modigliani and Miller (1958), a lot of effort has been made in the financial literature to determine the factors that influence the capital structure of companies. According to some economists, including Modigliani and Miller (1958), in the ideal world without taxes, the value of a company is indifferent of its leverage. If this is true, then two companies with a different debt-to-equity ratio but otherwise identical values would be valued the same. However, further research shows that there are circumstances under which leverage ratio matters. These efforts led to the development of various theories about the capital structure, with the two main theories being the trade-off and the pecking order theory.

Firstly, the trade-off theory suggests that companies set a target leverage ratio and, in the course of time, move towards this target level (Myers, 1984). This objective is based on a trade-off between the costs and benefits of raising capital (Modigliani and Miller, 1963, Hovakimian et al., 2004). Therefore, there are circumstances under which debt-to-equity mix matters, including expected benefit of debt, i.e., tax benefits and reduction of agency costs, and the expected costs of debt, i.e., information asymmetries and bankruptcy costs or risk. Harkbarth et al. (2006) state that if the optimal leverage is based on this trade-off, the benefits and costs of debt would both be determined by macroeconomic conditions. This is because the expected benefits of debt depend on whether there is economic expansion or recession, as this has cash flow implications. Furthermore, the expected cost of debt depends on the probability of default and the loss due to lack of default, which also dependent on the current state of the economy.

Secondly, the pecking order theory has been established by Myers and Majluf (1984) and is based on the information asymmetry between the investors of the company and its managers. This theory does not aim for an optimal capital structure but uses the preferences of the company to use internal instead of external sources as a starting point. The theory suggests that companies prefer internal financing over external financing because external investors demand a higher return for high risk and therefore demand a higher premium for shares (Frank and Goyal, 2009). However, debt is preferred over equity if external financing is required (Frank and Goyal, 2009). This is because managers are assumed to better know the conditions of a company than investors. When managers issue new equity, investors believe that managers think that a company is overvalued and managers are taking advantage of this over-valuation. As a result, investors will place a lower value on the new equity issuance.

2.2. Country-categorizations

2.1.1 Development

Leverage may be different in developed than in developing countries, since there are essential differences between them. For example, developing countries prefer externally generated funds, i.e., bank loans and equity, while developed countries prefer internally generated funds. This is due to faster average growth in developing countries, which results in more investment opportunities than they can finance internally (Atkin and Glen, 1992). However, this may affect external equity financing as well as external debt financing. The pecking order theory suggests that, after retained earnings, debt financing is the most favorable (Frank and Goyal, 2009). This indicates that developing countries prefer debt financing over equity financing. However, despite the increasing importance of external finance, developing countries have more institutional constraints, lower development of capital markets and more market inefficiencies than developed countries. Therefore they have less choice in financing instruments (Demirgüç-Kunt and Levine, 2004). For example, banks in developing countries cannot make sufficient resources available to companies in these countries, especially when the macroeconomic environment is too risky for long-term loans, or when the demand for government credit crowds out the private sector (Agarwal and Mohtadi, 2004). Moreover, Atkin and Glen (1992) argue that external equity plays a more significant role in the financial structures of companies in developing countries because of the faster-growing stock markets.

This higher importance of external equity in developing countries may explain why Demirgüç-Kunt and Maksimovic, (1999), who compared leverage of firms from 19 developed and 11 developing countries, found that companies in developed countries have more long-term debt than companies in developing countries. Chui et al., (2002) also examine the differences in leverage between developed and developing countries. Although the focus of this study is placed more on cultural characteristics, they also found that developed countries have significantly higher debt ratios than developing countries. This usage of higher debt should manifest itself in higher leverage ratios.

Chui et al., (2002) also use GDP per capita as an indicator of development and found a significant positive coefficient. Their results imply that companies in developed countries are more leveraged than their counterparts in developing countries and that further development of a country leads to substitution of equity for debt financing. However, when they included cultural factors, the

coefficients became insignificant. Besides Chui et al., (2002) many studies use GDP, as an indicator of development on leverage. However, there is a lot of contradiction between the studies. Some studies find that companies in countries with increased GDP have higher levels of economic growth and are more willing to use higher levels of debt to finance new investments (de Jong, Kabir and Nguyen, 2008). While most studies find a negative relationship between GDP and leverage (Bokpin, 2009; Dincergok and Yalciner 2011). They argue that higher GDP per capita may portray growth for firms and increase retained earnings, hence the negative relationship. Following the empirical evidence and the current literature of most studies, the hypotheses in this research are:

H1a: Firms located in developed countries, relative to firms located in developing, have higher leverage ratios.

H2a: Development of a country, as measured by GDP per capita and HDI, has a negative effect on leverage.

Demirgüç-Kunt and Maksimovic, (1999) argue differences in leverage between developed and developing countries are related to the differences in legal systems, financial institutions, and other macroeconomic factors. In the same way, Baxamusa and Jalal (2014) and Chui et al., (2002) argue that the different religions and cultures may explain the difference in leverage across countries. The following four sections show these differences.

2.1.2 Financial system

Bank-based and Market-based systems may affect leverage in a distinct way. The literature discusses the advantages and disadvantages of Bank-based financial systems compared to Market-based systems.[1] In Bank-based systems, banks provide most of the credit to the economy. This results in long-term relationships between borrowers and lenders (Demirgüç-Kunt and Levine, 1999). In Market-based systems, companies raise funds in capital markets (i.e., bond and stock markets). They are therefore better suited to offer liquid financial instruments to investors (Schmukler and Vesperoni, 2001).

The differences in the debt-to-equity ratio between Market-based and Bank-based systems has not yet been investigated. However, La Porta et al. (1999) find that Bank-based systems are more likely to associate with more robust debt markets, while Market-based countries rely more on the

[1] See citations and discussion in Allen and Gale (1997) and Demirgüç-Kunt and Levine (1999)

development of the equity market. Besides, several authors have investigated the relation between corporate capital structure and financial market development. These financial markets provide the underlying mechanism that determines whether a country is either Bank-based or Market-based (Demirgüç-Kunt and Levine, 1999). In Market-based countries the stock market, compared to the banking sector, in terms of size, activity and efficiency are more extensive than in Bank-based countries, while the opposite is true for Bank-based countries. With the development of the bank sector, companies have more options for borrowing and creditors are more willing to provide debts. Conversely, with the development of the stock market firms face more supply of funding and thus lower costs of equity. However, the stock market development also affects the transmission of information to creditors, which makes lending to a publicly quoted firm less risky. As a result, the existence of active stock markets increases the ability of firms to obtain long-term credit (Demirgüç-Kunt and Maksimovic, 1996). This study should determine which of these effects has a stronger impact.

Studies on the relationship between banking-sector development and capital structure are unanimously positive (Booth et al., 2001; Sett and Sarkhel, 2010; Jong, Kabir and Nguyen, 2008). This means that a more developed banking-sector facilitates the issue of debt which leads to the use of higher leverage in a country. While there is some contradiction on the relationship between stock market development and capital structure. Dincergok and Yalciner (2011) and Gajurel, (2006) found that stock market development has a positive effect on capital structure, while Bokpin (2009) and de Jong et al., (2008) found no relationship between these variables. Demirgüç-Kunt and Maksimovic (1996) found mixed results, for developing countries they found that more active stock markets have more long-term debt. Therefore, they argue that the impact of the information channel is more significant than the effect of the supply of equity funding for these countries. However, for developed countries, they found a negative relationship. Their results imply that improvements in the functioning of the already developed equity market lead to substitution of equity for debt financing, while improvement in developing equity markets result in a substitution of debt for equity financing. However, most of the studies, including studies with only developing countries, suggest there is a negative relationship between stock market development and capital structure (e.g., Mutenheri and Green, 2003; Agarwal and Mohtadi, 2004). Agarwal and Mohtadi (2004) also argue that the use of banking variables (assets and liabilities) in the study of Demirgüç-Kunt and Maksimovic (1996) aggregate measure leverage in its somewhat questionable.

If the observations of most of the studies are robust, and the stock markets facilitate the issue of equity, while the bank sector has the opposite effect, then companies located in Bank-based countries are expected use more debt than companies located in Market-based countries. This usage of higher debt should manifest itself in higher leverage ratios. This leads to the following hypotheses:

H1b: Firms located in Bank-based countries, relative to firms located in Market-based countries, have higher leverage ratios.

H2b: Stock market development (as measured by the market capitalization, value traded and turnover ratio) has a negative effect on leverage, while bank sector development (as measured by bank deposits and bank credit) has a positive effect on leverage.

The question remains why some countries have Bank-based financial systems while others have Market-based financial systems, even if they have similar levels of GDP per capita. La Porta et al. (1997) argue that it is mainly the legal system of a country that determines the financial system of a country. This is discussed further in the next section.

2.1.3 Legal system

The difference in legal systems may also explain differences in leverage ratios between countries, as discussed above. There are two primary legal traditions, Common-law and Civil-law, which constitute the legal systems of most countries in the world. Common-law is a law which is made by judges and then incorporated into the legislature, whereas Civil-law is part of the scholar and legislator-made Civil-law tradition. Therefore, countries with a Civil-law legal system rely on a higher degree of codification (Kock and Min, 2015). These law systems affect a variety of institutions in a country, which in turn shape outcomes such as unemployment rates, stock market development, or firm valuations (La Porta et al., 2008).

La Porta et al. (1997) found that the legal system is the primary determinant of the size and extent of a country's capital market. They show that countries with weak investor protections, as measured by both the character of legal rules and quality of law enforcement, have smaller and narrower capital markets. Their findings apply to both equity and debt markets. They also find that the development of the capital markets and the level of investor protection, as measured by legal origin, are closely related. This is because better shareholder protection leads to more confidence for investors to lend out their capital without the intermediation of a bank. Therefore, better

shareholder protection leads to larger stock markets within a country, which in turn leads to more Market-based financial systems. This also implies a strong correlation between Market-based financial systems and Common-law legal systems, and Bank-based financial systems and Civil-law legal systems. Something that is also noticed by Demirgüç-Kunt and Levine (1997). Besides, La Porta et al. (1997) argue that the Common-law systems provide a better quality of investor protection than Civil-law systems, and among the Civil-law systems German and Scandinavian systems provide better protection than the French system. According to Coffee (1999), this lower level of investor protection in Civil-law countries is because the government determines the law in these countries. He argues that Civil-law legal systems may well protect the minority shareholder against the forms of not known abuses in the system of concentrated ownership, but do not address abuses that they have not witnessed. For example, for theft of the control in an exploitative partial takeover. This lack of protection results in an environment in which the majority of shareholders control the market while the minority shareholders remain powerless so that they turn to financial institutions such as banks.

Although this is not the first study that investigates the relationship between economies and legal systems, the goal is to extend it to the capital structure of companies. Empirical evidence on whether the legal system directly influences the financing choice of firms is limited. Chui et al., (2002) examine the effect of legal origin on capital structure, although the focus of this study is more on cultural characteristics, than on legal origin. They found that Common-law countries have significantly lower debt-to-equity ratios than Civil-law countries. However, the result is only significant in the regression with firm-level data. Moreover, La Porta et al. (1999), Beck et al. (2000), argue that Civil-law countries tend to emphasize their debt markets while the Common-law countries tend to emphasize their equity markets. This emphasis on the debt markets should manifest itself in higher leverage ratios.

It is already noticed that Common-law countries have better shareholder and creditor protection. It is therefore important to observe how these variables relate to leverage. Jiraporn and Gleason (2007) find a negative relationship between the strength of shareholders rights and leverage, suggesting that companies with weak shareholder rights use more debts. They argue that this is consistent with the agency theory, which predicts that companies with weak shareholder rights entail higher bureaucratic costs and therefore have more debts. In combination with the previously defined findings and theories indicate that leverage is lower in Common-law countries compared

to Civil-law countries. Moreover, the fact that Civil-law systems German and Scandinavian systems provide better protection than the French system implies that the former Civil-law legal systems have higher debt-to-equity ratios.

There are also some studies that examine the relationship between creditor protection and capital structure. Most studies (e.g., La Porta et al. 1997) find that strong creditor rights result in higher debt-to-equity ratio because it induces lenders to provide credit to firms on favorable terms. However, Cho et al. (2014) find that strong creditor protection discourages firms from making long-term cash flow commitments to service debt because managers and shareholders avoid the risk of losing control in case of financial distress. The latter also criticize other studies, such as the study by La Porte et al. (1997), due to the lack of data points and the limited number of countries included. However, following the majority of the current literature, the hypotheses are:

H1c: Firms located in Civil-law countries, relative to firms located in Common-law countries, have higher leverage ratios.

H1c$_2$: Firms located in German and Scandinavian Civil-law countries, relative to firms located in French Civil-law countries, have higher leverage ratios.

H2c: Shareholder protection has a negative effect on leverage, while creditor protection has a positive effect on leverage.

2.1.4 Religion

Differences in religion may also explain the differences in leverage, as religion is one of the most prominent constituents of culture. People who are raised religiously have the same beliefs and preferences, even if they reject religion as adults (Guiso et al., 2003). Christians encourage, foster and benefit from the development of a robust Bank-based financial system (Baxamusa and Jalal, 2014). However, Baxamusa and Jalal (2014) argue that there is a difference between Catholic and Protestant countries on finance. This is because the Protestants severed much of their ties to the major European banking centers, after the Protestant Reformation movement of the 16th and 17th centuries. This movement led to a rise of capitalism and resulted in different ethics for Protestants (Weber, 1930). In order to meet the capital requirements of a business, the Protestants developed an alternative system that is not as debt-dependent (i.e., more equity-dependent). Therefore, Catholic countries may have a more robust debt market, while Protestant countries utilize more equity for the financing of their business activity (La Porta et al., 1999). La Porta et al. (1999) and Stulz and Williamson (2003) found that Protestant countries have stronger shareholder rights

protection than Catholic countries. Moreover, they also found that Protestant countries are more individualistic than Catholic countries. Both stronger shareholder rights protection and Individualism encourage participation in equity markets and use of equity as a source of financing. It is striking that the difference in shareholder rights is also a prominent difference between countries with a Civil-law and Common-law legal system. An explanation for this is that Catholic-majority countries tend to be overwhelmingly Civil-law based, while Protestant-majority countries tend to be Common-law based (Baxamusa and Jalal, 2014). However, the question remains whether it is the legal system that influences the religion of a country or vice versa. According to Siems (2007) and Stulz and Williamson (2003), it is the religious characteristics that shape the legal regimes and that this ultimately encourages different types of financial markets.

In Islamic religions, prohibition of Riba is one of the most prominent financing principles, agreed upon by the Shariah and the Quran (Farooq, 2012). This principle ensures that a predetermined (fixed) interest rate is prohibited (Aggarwal and Yousef, 2000). This is because the charging of interest gives the lender an unfair advantage because the repayment is made whether the investment is good or not, so there is no fair distribution of the risk involved (Gunn and Shackman, 2014). This Islamic law is widely interpreted as discouraging the use of interest, or debt (Gunn and Shackman, 2014). This is also a reason why Muslims do not act as nominal creditors in an investment, but as partners in the company (Hourani, 2004). In other words, the Islamic religion promotes equity-based financing (Gunn and Shackman, 2014). By using equity-based financings, companies that adhere to the Islamic religion should promote a lower debt-to-equity ratio.

Empirical multi-country research into the capital structure with comparisons between different religions is also limited, with one study of Baxamusa and Jalal (2014) which compares Catholic and Protestant religions. They find evidence that companies in predominantly Protestant countries tend to have lower debt levels than those in predominantly Catholic countries. For Islamic countries, Gunn and Shackman (2014) find no significant differences between Muslim and non-Muslim countries with regard to total debt-ratios. Whereas, Omet and Mashharawe (2003) find that companies in Kuwait, Jordan, Oman and Saudi Arabia generally have low leverage ratios. However, the latter study did not make a comparison with other religions. Overall recent multi-country studies on capital structure have provided evidence that religion influence a company's capital structure decisions, but no research has been done explicitly comparing capital structure in Christian versus Islamic countries.

Farooq (2012) argues that the prohibition of Riba in Islamic countries leads to preferences of equity-financing over debt-financing, indicating that companies located in Islamic countries use more equity than companies located in countries with other religions. This usage of higher debt should manifest itself in higher leverage ratios than in countries with other religion, including the Christian religion. As noted before, prior research suggests that there are also differences between the two Christian religions. If the observations of Baxamusa and Jalal (2014) are robust and Catholic countries have a more robust debt market, while the Protestant countries utilize more equity for the financing of their business activity, than Catholic countries have higher leverage ratios. The hypotheses are, therefore:

H1d: Firms located in Christian countries, relative to firms located in Islamic countries, have higher leverage ratios.

H1d$_2$: Firms located in Protestant countries, relative to firms located in Catholic, have higher leverage ratios.

H2d: Protestant and Islamic religiosities have a positive effect on leverage, while Catholic religiosity has a negative effect on leverage.

2.1.5 Culture

Aside from religion, other national cultural factors may affect capital structures. Chui et al., (2002), argue that difference in leverage are related to the culture of a country because culture affects management's perception of the cost and risk related to debt-finance. Hofstede (2003) provides a comprehensive definition of culture as "the collective programming of the mind that distinguishes the members of one category of people from those of another". Hofstede (2003) developed a framework which contained dimensions of culture, although culture has been described as "difficult to define". This framework is based on four cultural dimensions, namely: Individualism (IDV), Power Distance (PDI), Masculinity (MAS), and Uncertainty Avoidance (UAI). This study uses this framework as it is most widely known and applied in the academic context.

First, Individualism is the extent to which people feel independent and look after their own interest. Heine et al., (1999) argue that societies with individualistic members tend to be overoptimistic with predicted outcomes and overconfident of their own capabilities. Zheng et al. (2012) argue that this may result in overconfidence of individualist creditors about their ability to select companies and argue that this may explain the higher debt-levels they found. Moreover,

Jensen and Meckling (1976) argue that debt-financing can mitigate agency costs, and agency costs are more severe in firms in individualistic countries. Consequently, companies in these countries have higher leverage, while Hirshleifer and Thakor (1992) argue that managers which are concerned with their own reputation, choose lower debt levels to maximize success and enhance their reputation rather than maximizing profits. Clearly someone has to shed light on this contradiction.

Second, Power Distance is the extent to which the less powerful members of organizations and institutions accept and expect that power is distributed unequally. Countries with high Power Distance may be associated with lower trust level and more opportunistic behavior (Zheng et al., 2012). Therefore, Zheng et al. (2012) suggest that these countries have higher transaction costs for long-term debt contracts. Consequently, companies in these countries choose equity-financing over debt-financing and therefore have lower leverage.

Third, Masculinity is the extent to which a culture emphasizes factors such as achievements, monetary rewards, and output. High Masculine countries value individual success and independence highly (Chui et al., 2002). Hirshleifer and Thakor (1992) show that when managers care about their own performance, they choose safer projects with a higher probability of success. Hence, managers are less likely to take on debt (Chui et al., 2002).

Fourth, Uncertainty Avoidance deals with a society's tolerance for uncertainty and ambiguity. This indicates that countries with high Uncertainty Avoidance might be reluctant to increase leverage, as leverage increases the probability (risk) of bankruptcy (Arose 2014).

The effects of the cultural dimensions of Hofstede (2003) on capital structure are analyzed before and are unequivocal for Power Distance, Masculinity, and Uncertainty Avoidance. All indicating a negative relationship between Power Distance and leverage (Wang and Esqueda 2014; Arosa et al. 2014), a negative relationship between Masculinity and leverage (Chui et al. 2002, Wang and Esquesa, 2014), and a negative relationship between Uncertainty Avoidance and leverage (Chui et al. 2002, Wang and Esquesa, 2014, Arosa et al. 2014). However, there is a contradiction in previous empirical research on the relationship between Individualism and leverage, where Wang and Esquesa (2014) and Gray et al. (2013) found a positive relation, and Mac and Lucey (2010) found a negative association.

The discussion above suggests that these cultural dimensions influence capital structure. This study aggregates these cultural dimensions into different country-categorizations to study

differences between country groups with the same cultural characteristics, on the capital structure. Gleason et al. (2000) investigated whether the capital structure differs per cultural country clusters which, based on these four dimensions of Hofstede (1980). They found that capital structures vary by the cultural classification of retailers. However, they only included 14 European Community member countries. It is clear that more empirical work is needed that contains intercontinental cultural comparisons.

The countries are divided into two cultural clusters based on the distribution and scores of Hofstede (2003, p.62). The differences between these cultural clusters are used to show the differences in cultures between countries. A first glance at the data reveals that cultural Culture cluster one has notable higher scores on Individualism and lower scores on Power Distance than countries with cultural cluster two. The effect of Power Distance on leverage is unequivocally significant negative, while most of the studies on Individualism indicate a positive relation. Therefore cultural Culture cluster one is expected to have higher leverage ratios than cultural cluster two. For the other two cultural dimensions, the majority of prior empirical research indicates that the ratio between equity and debt is most elevated in cultures with low Masculinity and Uncertainty Avoidance. Thus,

H1e: Firms in countries which are defined as cultural Culture cluster one, relative to cultural cluster two, have higher leverage ratios.

H2e: High Individualism and low Power Distance, low Masculinity and low Uncertainty Avoidance, are associated with lower leverage ratios.

2.3. Interaction between country-categorization groups

There may be a substantial overlap between the country-categorization groups. For example, it has already been noticed that there is a strong link between Bank-based financial systems and Civil-law legal systems, and Market-based financial systems and Common-law legal systems. La Porta et al. (1999) also find that Bank-based countries are generally more Catholic than Protestant. Besides, it is mentioned that Catholic-majority countries tend to be overwhelmingly Civil-law based, while Protestant-majority countries tend to be overwhelmingly Common-law based (Baxamusa and Jalal, 2014). In other words, there is a clear link between Bank-based countries, Civil-law countries, and Catholic countries. Moreover, there is also a link between Market-based, Common-law and Protestant countries. Besides, La Porta et al. (1999) state that these countries

have less developed capital markets and lower overall development. With regard to the culture of a country, Stulz and Williamson (2003) found that Protestant countries are more individualistic than Catholic countries. The presence of these associations makes it difficult to distinguish between the different country categories. This makes it hard to investigate whether the link between leverage and country categorization is due to that country categorizations group or another using cross-country data.

The current literature deals with this correlation in several ways. Chui et al. (2002), which studies the effect of culture on leverage, does this by controlling for the other differences, including economic development, the legal systems, and financial institutions. For example, they use a dummy for the differences in leverage between developing and developed countries, and the control variable, GDP per capita, to control for the economic development.[2] Baxamusa and Jalal (2014) do this differently by concentrating on the religious environments within one country, the United States, in addition to a cross-country comparison. The companies in the United States all have access to similar financial and legal institutions. Therefore they are controlling for all other institutional characteristics. This may be a decent method to reflect the difference between Catholic and Protestant religions on leverage, but this method would not work for the other categories, as they do not vary within a country. However, the reasoning behind this method can be used by including interactions between the dummies in the regressions. For example, by adding these interactions the differences in leverage between country-categorization groups can be investigated in a sample with only Bank-based countries, Civil-law countries, etc. Thereby controlling for the counterpart country-categorization group, i.e., Market-based countries, Common-law countries etc. There are also some studies that control for this correlation entirely differently. For example, Bancel and Mittoo (2004) held a survey among managers in 16 European countries about the determinants of the capital structure. However, this method brings its own set of problems.

[2] This study also includes dummies and country-specific variables for every country-categorization and also controls for the other institutional country effects.

3. Research method

3.1. Model

This study uses two tests for hypotheses H1. Firstly, permutation tests are used to check whether there is a significant difference in leverage and other country-specific variables between the groups in each of the five categorizations. Secondly, aggregated panel analyzes are performed, whereby the differences in leverage between country groups are included as dummy variables.[3] The panel model is specified below:

$$(1)\ DTE_{i,t} = \beta_{con} + \alpha DTE_{i,t-1} + \beta_{dc}{}^{*} DC_i + \beta_{mb}{}^{*} MB_i + \beta_{cl}{}^{*} CL_i + \beta_{is}{}^{*} IS_i + \beta_{cc2}{}^{*} CC2_i + \delta_{cc*cc}{}^{*} (CC_i * CC_i) + \lambda X_{i,t} + \gamma_i + \varepsilon_{it}$$

where subscript *i* and *t* represent the country and time, respectively. In this case, *i* represents the cross-section dimension and *t* represents the time-series component. DTE is the dependent variable which is a measure of capital structure. β_{con} represent the constant in the equation. Variable $\alpha DTE_{i,t-1}$ represents a lagged dependent variable that may be added to test whether firms converge to a stable debt-to-equity ratio over time, as proposed by the trade-off theory.[4] $\beta_1 DC_i$ till $\beta_5 CC2_i$ stands for the five different country-categorization dummies (i.e. developing, Market-based, Common-law, Islamic and culture cluster two), which capture the difference between the groups within a country-categorization.[5] $\delta_{cc*cc}{}^{*}(CC_i * CC_i)$ represent all interactions between all country-categorization groups combinations (either developing, Market-based, Common-law, Islamic or culture cluster two). As a result, there are 10 interactions, each of which is performed in a separate set.[6] These interactions are included to check whether the effect of a specific country-categorization group is equal for every country-categorization. For instance, the difference between Bank-based and Market-based economies may be different in developed countries than in

[3] The random effect model is used because of the inclusion of dummy variables and static country-specific variables.

[4] When the lagged dependent variables suppresses the explanatory power of other independent variables, it is excluded from the model.

[5] Country categorization groups that are expected to lead to higher debt-to-equity ratios than the counterpart country categorization group are used as reference categories. As a result, a negative sign is expected. This is done for the reasons described in section: Panel analysis with country-categorization dummies.

[6] Therefore, the first set contains an interaction between developing countries and Market-based countries, in the second set this interaction is replaced by an interactions between developing countries and Common-law countries, in the third set the interaction is replaced by an interactions between developing countries and Islamic countries, etc.

developing countries. $\lambda X_{i,t}$ is a vector of country macro-economic control variables and γ_i, and ε_{it} represent the country-specific effects and the stochastic term in the equation.

In a separate regression, equation (1) is used for the differences between the Civil-law legal systems and the two prominently Christian religions. For robustness, the smallest quartile of countries are compared with the largest quartile of countries for the country-categorization development and financial system.

For hypotheses H2, a separate aggregated table is included with country-specific variables that capture the underlying variables for the country-categorizations. For example, GDP is used for the development of a country. The panel model is specified below:

$$(2)\ DTE^{*}_{i,t} = \beta_{con} + \alpha DTE^{*}_{i,t-1} + \vec{\beta}'\overrightarrow{DCSV}_{i,t} + \vec{\delta}'\overrightarrow{SCSV}_{i} + \lambda X_{i,t} + \gamma_i + \varepsilon_{it}$$

in this model the debt-to-equity ratio $DTE_{i,t}$, is a function of a vector, $DCSV$, of the dynamic country-specific variables, and $SCSV$, the static country-specific variables. The dynamic country-specific variables include GDP per capita the stock market and the banking indicators, among others, and the static country-specific variables include Shareholder protection and creditor protection, among others. [7] All the other signs are as described in equation one.

In addition, a separate panel regression is executed for each country group within each country-categorization. Therefore, one set contains the countries characterized as one side of the group, such as Bank-based economies, and the other set includes the countries classified as the other side of the group, such as Market-based economies. The goal of these estimations is to compare the impact of the macroeconomic variables on the financial structure of firms across different country groups within different country categories. Moreover, it allows checking if the speed of adjustment toward the target leverage ratio differs between different country categories. Therefore, the variable $\alpha DTE_{i,t-1}$ can be used to check whether the adjustment speed to the target of the firms differs per country-categorization group. The equation to test this is similar to equation (2), only the static variables are not included. This has a number of advantages. First of all, it is consistent with the work of Agarwal and Mohtadi (2004), which makes it easier to compare the differences. In addition, by dividing the full sample into groups, the sample becomes smaller, so there is a risk for too few observations concerning the static variables.

[7] See Appendix 1 and section 3.3 for a complete description of the dynamic and static country-specific variables.

3.2. Data

The sample consists of data from 1990 to 2016 of more than 36.000 companies from 40 countries. These countries all have a stock market and available data for a sufficiently large number of companies. The companies have traded on the stock exchanges in the countries during the period covered in this study. See Appendix 2 panel F for a list of countries and the number of companies per country. In line with research of Agarwal and Mohtadi (2004), the data is aggregated over the firms within each country to smooth over cross-company variances that are due to idiosyncratic factors unrelated to the model. For example, companies belonging to different industries or different stages of expansion with varying needs for capital. Appendix 1 provides details on definitions, data sources and summary statistics of variables used in this study.[8] The variables are described in detail in the next section.

3.3. Variable description

Dependent variable (Y): The variable debt-to-equity tracks the evolution of total debt as a percentage of the book value of equity, obtained from the Eikon database. Although this data is also available at industry level, a careful examination of the data shows that it is not possible to conduct a study at industry level. This is because there may only be a few companies in a particular industry for a specific country and no data about that industry for another country, especially in developing countries. Agarwal and Mohtadi (2004) argue that these differences are primarily due to different import and export compositions. Thus, to avoid discrepancies across companies, the data is aggregated for all companies in a given country in a particular year.

Country-categorization dummies (CC): Before writing anything about the categorization of the countries into clusters, it is worth noting that although categorization schemes are convenient for analysis, it can be somewhat arbitrary. This because it is often not based on strict criteria, and countries are subjective to changes over time. This study endeavor to offer the most sound rationales and methodologies for using a given categorization system. The criteria for the categorization of the countries into country groups are shown below.[9]

[8] Variables that are skewed are transformed in log, to achieve normal distributed variables.

[9] The dummies are included in the opposite direction, for the reasons described in section: Panel analysis with country-categorization dummies.

Development: Consistent with Chui et al., (2002), criteria of the IMF, in the "World Economic Outlook (WEO)", are used to classify countries as developing or developed. The institution divides the world into two major groups: developed (advanced economies and emerging market) and developing economies. It is worth noting that although this classification is not based on strictly economic criteria, it reflects a very reasonable distribution of countries based on development. A dummy variable is created that takes on value one if the country is developing, and value zero if it is developed.

Financial system: This study uses the conglomerate Indexes of Financial Structure (CIFS) of Demirgüç-Kunt and Levine (1999), to classify the countries as Bank-based or Market-based. This index is based on an aggregation of the size, activity, and efficiency of the stock market relative to the size of the bank sector. A higher value of this structure means that the stock market is more developed compared to the bank sector. Therefore, countries that have scores above average are referred to as Market-based and countries that have scores below average as Bank-based. A dummy variable is included that takes on value one if the country is Market-based, and value zero if the country is Bank-based.

Legal system: The country-level data on the legal system is obtained from La Porta et al. (1997), and the data is supplemented with data from the CIA World Factbook. A dummy variable is included that takes on value one when the country belongs to the Common-law origin and zero if it belongs to the Civil-law origin. Another dummy is created for the differences between the two Civil-law legal systems. This dummy takes on value one when the country has a French Civil-law legal system and value zero in the country has a German or Scandinavian Civil-law legal system.

Religion: The data on the religious majority for the division of Christian countries to Catholic or Protestant are obtained from the study of Baxamusa and Jalal (2014), and for Islamic countries from the study of Gunn and Shackman (2014). Their rank is based on the percentage of total adherents who belong to these religious denominations. Most of the percentages used in their study are based on the data from CIA World Factbook. This study uses more recent data of the CIA World Factbook to see whether the same countries belong to the same religious categories, and the data is supplemented with data of multiple sources, including PEW Research Center Surveys when CIA World Factbook does not differentiate between Catholic and Protestant countries. Countries that are not used in their studies are also supplemented with data from these sources. A dummy variable is included that takes on value one when the majority of the country is Islamic and value

zero when the majority is Christian. Another dummy variable is used to define the differences between the two Christian religions within a country. The dummy variable takes on value one when it is a Protestant-majority country and value zero when it is a Catholic-majority country.

Culture: The countries have assigned a score on the four cultural dimensions: IDV, PDI, MAS, and UAI (Hofstede, 2003). Based on these scores Hofstede (2003, p.62) facilitates the formation of culture groups using hierarchical cluster analysis. This analysis produced a dendrogram in which the first split, into two large cultural clusters, is used in this study. This first cultural split is used because a later split reduces the number of countries per cluster, and Hofstede (2003) argues that a further separation may be somewhat arbitrary. Countries that are not used in Hofstede's study are supplemented based on similar cultural dimensions. A dummy variable is included that takes on value one when the country is in Culture cluster one and zero when the country is in Culture cluster two.

Dynamic country-specific variables (DCSV): The country-specific variables that represent the underlying value for the country-categorization are described in summary below. Appendix 1 provides more details on definitions and data sources.

Development: GDP per capita is a measure that is often used as an indication for the development of a country (e.g. by Chui et al., 2002). The UNDP's Human Development Index (HDI) is another well-established multi-dimensional measure of development. This index draws on various indicators in addition to the measurement related to income, including education and health. Therefore, HDI and the GDP per capita are used to represent the development of a country.

Financial system: Three variables are used that represent the stock market, and two variables are used for the bank-sector. These variables are the most used in the previous literature (e.g., Demirgüç-Kunt and Levine, 1999; Agarwal and Mohtadi, 2004). Market capitalization / GDP, traded value / GDP, and the turnover rate are respectively used for the size, activity and efficiency of the stock market. For the bank-sector, banks assets / GDP is a measurement of the size of the bank sector, and bank credit / GDP is a measure of the activity of the bank-sector.

Static country-specific variables (SCSV): The data on the variables that are used as underlying determinants for the country-categorizations: the legal system, religion, and culture are not in time series. This is because not enough data points are available.

Legal system: Shareholder rights and creditor rights are used to measure the differences between the legal determinants. Simeon et al. (2005) find that creditor rights are incredibly stable over time. While figures from the World Databank indicate that shareholder right are improving over time.[10]

Religion: The variables that are used to represent the religion of a country are based on the religiosity of the population of the country. This includes the percentage of the population of each country that belongs to the three religions: Catholic, Protestant, and Islam.

Culture: The four cultural dimensions, IDV, PDI, MAS, and UAI, are the variables which represent the culture of a country. Although the data is not in time-series, Beugelsdijk et, al. (2015) argue that the cultural dimensions within countries are generally stable over time.

Macro-economic control variables: The macroeconomic control variables, foreign direct investment, investment, and GDP per capita used in this study are the same as the control variables used by Agarwal and Mohtadi (2004). Moreover, TAX income and inflation are added because they are widely used in current literature (e.g., Bokpin, 2009, Set and Sarkhel, 2010, Dincergok and Yalciner, 2011).

[10] There is only time-series data available from 2013 to 2016 on the World Bank database. This data seems to vary considerable over this four year time period. Further research may include time-series data on shareholder protection when more data points are available.

4. Findings

4.1. Stylized facts

4.1.1 Categorizing of countries

TABLE 2. COUNTRY CATEGORISATION GROUPS AND COUNTRY-SPECIFIC VARIABLES

CC	Development		Fin. System		Legal system		Religion		Culture	
Group	Developed	Developing	Bank-based	Market-based	Civil	Common	Christian	Islam	Cluster 1	Cluster 2
Variable N	22	18	24	16	24	16	27	6	16	24
DTE	149.2	113.8	147.3	110.6	148.8	108.3	137.3	127.2	152.4	119.5
GDP	32213 ***	4174	18361	21449	20842	17728	23127	3671	35121 ***	9246
HDI	0.86 ***	0.65	0.76	0.78	0.79	0.73	0.79	0.62	0.86 ***	0.71
INDEX	0.19	-0.08	-0.54	0.81 ***	-0.24	0.55	-0.15	-0.20	0.09	0.05
1) MCR / BLL	0.85	1.00	0.53	1.40 ***	0.67	1.31 *	0.89	0.83	0.87	0.96
MCR	102.0	54.2	38.9	140.4 ***	52.7	125.7 *	66.0	51.1	84.9	79.2
BLL	112.3 **	53.1	82.3	89.3	86.6	83.0	80.6	64.9	110.6 *	69.0
2) TR / BC	0.60	0.36	0.26	0.73 **	0.39	0.53	0.38	0.56 *	0.48	0.48
STR	68.5 ***	16.5	22.2	79.3 ***	33.6	64.7	36.9	20.6	56.2	38.5
BC	115.3 **	47.7	68.8	97.9	74.8	90.3	79.4	49.3	118.1 *	59.9
3) TR * OH	0.01 *	0.00	0.00	0.02 *	0.01	0.01	0.01	0.01	0.01	0.01
TR	74.0 *	39.9	51.4	70.5	66.1	49.8	53.5	64.9	70.9	51.0
OH	1.7	4.1 ***	3.0	2.4	2.6	3.0	2.8	3.6	1.7	3.5 **
SRP	6.6	6.2	6.4	6.5	6.1	7.0	6.4	6.7	6.6	6.3
CRP	2.2	1.9	2.0	2.2	1.8	2.6	1.9	2.7	2.2	2.0
CAT	34.0	36.5	40.6	27.0	46.0 *	18.9	48.7 ***	8.1	33.5	36.3
PRO	16.5	16.1	14.0	19.9*	10.9	24.6	21.2 *	8.4	24.0 *	11.3
ISL	3.9	27.5 ***	14.1	15.2	12.7	17.3	3.3	74.8 ***	3.2	22.1 ***
IDV	59.5 **	31.4	45.9	48.4	45.9	48.4	56.1 *	26.8	73.2 ***	29.3
PDI	47.2	71.4	58.7	57.2	58.5	57.5	52.2	75.7	39.7	70.4 *
MAS	52.7	49.7	51.8	50.7	50.6	52.4	51.8	52.7	58.1	46.9
UAI	63.7	65.1	71.0	54.4	76.6 *	45.9	66.9	57.3	59.8	67.4

Notes: Permutation test for difference between the sample means in country-specific variables between the country-categorizations. CC= country-categorization, N= Number of countries (40 countries in total) and T= the mean of 27 years (1990-2016). The abbreviations of the variables can be found in Appendix 1. The *** Significant at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. *Source:* Author calculations.

Table 2 presents the descriptive statistics for the differences between the means in leverage and the country-specific variables. Appendix 2 shows the complete distribution of the different countries to the country category groups, and the variables representing the underlying value for that specific categorization. These variables are also shown in gray in table 2 in the country-categorization group to which they refer.

Panel A in Appendix 2 shows that the average GDP per capita in the sample ranges from $670 in Kenya to $58,925 in Norway. Thus, the sample includes some of the poorest and richest countries in the world. When dividing the countries into developed and developing countries based on the criteria of the IMF, there is a clear separation in GDP per capita and HDI between the countries.

For example, the GDP per capita is more than two times as large in Portugal, the lowest classified developed country, as in Chile, the highest classified developing country. In addition, it can be seen that average leverage is more than 30% higher in developed countries than in developing countries.

The outcome of the Conglomerate Index of the Financial Structure of Demirgüç-Kunt and Levine (1999), which is used to classify the countries as Bank-based or Market-based, is shown in panel B of Appendix 2. This index is based on an aggregation of the size, activity, and efficiency of the financial markets. More specifically, after removing the means of each series, the index is based on the average of Capitalization vs. Bank assets, Trading vs. Bank Credit, and Trading vs. Overhead Cost.[11] Countries with a negative score are classified as Bank-based, and countries with a positive score are classified as Market-based. These outcomes are also presented as the average per country-categorization group in table 2. Before continuing with the differences in leverage between Bank-based and markets-based countries, it is worth noting that the classification of countries into Bank-based or Market-based yields a number of problems. This is mainly because this study uses a long dataset and countries with underdeveloped financial markets. For example, there are some countries, such as Indonesia and Pakistan, which are classified as Bank-based in the 1990s, and Market-based in the 2010s (the opposite is true for Nigeria). This is in particular because countries in which both markets, the bank-sector, and the stock market, are poorly developed, a small increase in the development of the stock market (bank-sector) can result in a switch from Bank-based (Market-based) to Market-based (Bank-based) financial systems. In addition, the index is made on the basis of the countries used in the study. As a result, countries that are in the middle of the index are affected by outliers, such as Hong Kong. With this in mind, the study proceeds with explaining the difference in leverage between Bank-based and Market-based economies. Table 2 shows that the leverage ratio is over 30% higher in Bank-based countries than in Market-based countries. Moreover, it also shows that, apart from the stock markets, the banking sector variables are slightly higher. This, in combination with a slightly higher GDP per capita indicates that Market-based financial systems are more developed than Bank-based financial systems, as also argued by Demirgüç-Kunt and Levine (1999).

Panel C in Appendix 2 shows that Common-law countries have a higher shareholder and creditor protection than Civil-law countries, as argued by La Porta et al. (1997). It also shows that countries

[11] The analysis are also conducted using the means-removed average of Capitalization vs Bank, Trading vs Bank Credit, and Turnover vs Overhead Cost and obtained virtually identical rankings and results. This is in line with Demirgüç-Kunt and Levine (1999)

with a Common-law legal system have a larger average market capitalization than countries with a Common-law legal system, while the bank-sector is approximately the same size. This is in line with Demirgüç-Kunt and Levine (1997) findings that Common-law countries tend to be more Market-based. Panel C2 in Appendix 2 also shows the differences between the French Civil-law and the other Civil-law countries (German Civil-law and Scandinavian Civil-law). It can be seen that the creditor protection and shareholder protection are considerably higher in countries with a German or Scandinavian Civil-law legal system than with a French Civil-law legal system, as also suggested by La Porta et al. (1997). However, it is mainly the creditor protection that is much higher in German and Scandinavian Civil-law countries. The differences in leverage are also as expected, where the leverage ratio is almost 40% lower in Common-law legal systems than in Civil-law legal systems. However, it are mostly the German and Scandinavian Civil-law countries that have higher leverage ratios than the Common-law and French law countries, as the latter two categorizations have similar leverage ratios. That German and Scandinavian Civil-law countries have higher leverage ratio and considerable higher creditor protection implies that there is a positive association between both variables.

Differences in the leverage ratio between Christian-majority countries and Islamic-majority countries are small, as shown in panel D in Appendix 2. This is consistent with the study of Gunn and Shackman (2014) who found no significant differences between Muslim countries and non-Muslim countries regarding total debt ratios. Panel D2 in Appendix 2 shows that the main difference in debt-to-equity are within Christian-majority countries. The average debt-to-equity ratio is more than 30% higher in countries with a Catholic-majority than countries with a Protestant-majority. This is in line with the findings of Baxamusa and Jalal (2014).

Panel E in Appendix 2 shows that Culture cluster one countries have higher debt-to-equity ratio than Culture cluster two countries, with an average debt-to-equity ratio of 159 compared to 104,5. It also shows that the largest difference in cultural dimensions between the two groups is in Power Distance, which is considerably higher in Culture cluster two, and Individualism, which is markedly higher in Culture cluster one. Moreover, panel E2 shows the difference in leverage between the countries with lowest and highest scores on the four cultural dimensions. The main differences in leverage are within the Power Distance, as the ten countries with the highest score on Masculinity are over 50% more leveraged than the ten countries within the lowest score.

4.1.2 Cohesion country-categorization groups

TABLE 3. COHESION BETWEEN THE COUNTRY-CATEGORIZATION GROUPS

Country categorization			Development		Financial system		Legal system		Religion		Culture	
Country group		N	Developed	Developing	Bank	Market	Civil	Common	Christian	Islam	Cluster 1	Cluster 2
Development	Developed	22			59%	41%	64%	36%	73%	0%	68%	32%
	Developing	18			61%	39%	56%	44%	56%	33%	6%	94%
Fin. System	Bank-based	24	54%	46%			71%	29%	71%	13%	38%	63%
	Market-based	16	56%	44%			44%	56%	63%	19%	44%	56%
Legal system	Civil	24	58%	42%	71%	29%			75%	13%	38%	63%
	Common	16	50%	50%	44%	56%			56%	19%	44%	56%
Religion	*Christian	27	63%	37%	63%	37%	67%	33%			56%	44%
	Islam	6	0%	100%	50%	50%	50%	50%			0%	100%
Culture	Cluster 1	16	94%	6%	56%	44%	56%	44%	94%	0%		
	Cluster 2	24	29%	71%	63%	38%	63%	38%	50%	25%		
*Christian	Catholic	18	61%	39%	72%	28%	89%	11%	100%	0%	44%	56%
	Protestant	8	63%	38%	50%	50%	13%	88%	100%	0%	75%	25%

Notes: N= Number of countries (40 countries in total) and T= the mean of 27 years (1990-2016).

Table 3 represents the cohesion between the country-categorization groups. It shows that developed countries are slightly more likely to be Market-based than developing countries. This is in line with the findings of La Porta et al. (1999) and Demirgüç-Kunt and Levine (1999). However, the relation in this study is not nearly as strong, as they find a strong correlation between Market-based financial systems and high development. A possible explanation is that they include more developing Bank-based countries in their sample and use different time periods. Table 3 also shows that developed countries are slightly more likely to have a Civil-law legal system than developing countries. This is in contrast with the findings of La Porta et al. (1999), who found a strong correlation between low economic development and Civil-law legal system. Moreover, developed countries tend to be overwhelmingly Christian and in Culture cluster one, while the religion in developing countries is more widespread. For example, all Islamic countries in the sample are developing countries. Moreover, developing countries are overwhelmingly in Culture cluster two, with high Power Distance and low Individualism. Table 3 also shows the cohesion of the country-categorizations with Catholic-majority and Protestant-majority countries. La Porta et al. (1999) argue that low economic development is highly correlated with Catholic countries. However, table 3 and the percentage of religiosity in table 2 show a similar association between development and being Protestant or Catholic.

Apart from this coherence, there are some other interesting connections between country-categorization groups which are in line with the current literature. For example, table 3 shows that Common-law countries tend to be more Market-based than those with Civil-law systems. It is also striking that Catholic majority countries predominantly have a Civil-law legal system, whereas Protestant majority countries predominantly have a Common-law system, as argued by Baxamusa

and Jalal (2014). More specifically, Canada and Ireland are the only countries in the sample with a Common-law legal system and a Catholic religion, while Norway is the only country in the sample with a Civil-law legal system and a Protestant religion. With other words, there is a strong connection between Bank-based countries, Civil-law countries and Catholic countries, and between Market-based countries, Common-law countries and Protestant countries as proposed by La Porte et al. (1999). Lastly, there is a very high cohesion between Christian religions and Culture cluster one, implying that religion and culture are closely related.

4.1.3 Correlation analysis

The matrix of correlation in Appendix 3 presents the correlation between the leverage ratio, the country-specific variables and the macroeconomic control variables. It is seen that variables representing the development of countries, GDP per capita and HDI, are positively correlated with leverage. Moreover, the banking sector variables, domestic assets/GDP and bank credit/GDP, are also positively correlated with the debt-to-equity ratio. There is some contradiction in the stock market variables, as market capitalization is negatively correlated with leverage, while shares trade and the turnover ratio are positively correlated with leverage. The correlation between the stock market variables and banking sector is high and positive. This may be partly explained by the high correlation of both variables with logGDP per capita. Therefore, both variables are positively influenced by economic prosperity. However, it is also possible that the stock market variable and the bank sector variable reinforce each other, as suggested by Demirgüç-Kunt and Maksimovic (1999). The variables, shareholder protection, and creditor protection, representing the legal system does not seem to be correlated with leverage. For the religion, it is seen that Protestant countries are negatively correlated with leverage, while there is not much correlation between countries with a Catholic majority and Islamic majority on leverage. Furthermore all cultural dimensions, expect Uncertainty Avoidance, are negatively correlated with leverage.

A multi-collinearity problem can occur due to high correlations between different country-specific variables. Firstly, the log GDP per capita is very strongly correlated with the HDI. Within the variable financial markets, a substantial correlation is found between the two variables that represent banking sector, i.e., bank deposit of domestic assets/GDP and bank credit/GDP. A high correlation is also found between the three stock market variables, in particular between the log of the trading value log and log of the turnover ratio. Moreover, the debt-to-equity has a very high correlation with the lagging dependent term. Variance inflation factors (VIF) are also computed as

a method to detect multi-collinearity problems. With a rule of thumb of 4, the results indicate that the two bank variables, log GDP per capita and HDI, and the log of the traded value and log of the turnover ratio should not be performed in the same regression. In addition to this multi-collinearity, the panel dataset is checked for autocorrelation and heteroscedasticity.

4.2. Permutation tests

4.2.1 Permutation test country-specific variables

Table 2 already showed that the debt-to-equity is higher in developed, Bank-based, Civil-law, Christian countries, and countries with Culture cluster one. All these outcomes are in line with the expectations and the hypothesis 1A to 1E. However, the permutation tests, which are also included in table 2, never shows a significant difference between the country-categorization groups in the full sample. A closer study of the data reveals that the differences in leverage between the countries converge over time. More specifically, the standard deviation in leverage is more than halved over the time covered in this study, with a standard deviation of 90 at the beginning of the dataset and 42 at the end of the dataset. For this reason, charts are included in the next section to see how the debt-to-equity ratio develops over time.

Before proceeding with this graphs and permutation tests over time, it is worth noting a number of interesting issues from the permutation test in the full sample. For example, in most country-categorization groups with lower debt-to-equity ratios, except for the country-categorization religion in which the groups have similar debt-to-equity ratios, the size of the stock market relative to the size of the banking sector is larger than the counterpart country-categorization group with lower leverage ratios. This indicates that the size of the stock market relative to the size of the bank sector may be the first order determinant for the difference between the country categories. For this reason, the variable that presents the size of the financial markets, i.e., the market capitalization for the stock market and the bank assets for the banking sector, are of particular importance. Therefore, these variables are included in the graphs in the next section that show the variables over time.

Other striking things are that the GDP per capita and HDI are significantly higher in countries classified as Culture cluster one. This is what one could expect as most countries in Culture cluster one are developed. It is also remarkable that three groups with higher debt-to-equity ratios also have significantly higher scores on Individualism. This is in contrast with the findings of Mac and Lucey (2010) that higher Individualism is associated with lower leverage ratios.

4.2.2 Permutation test over time

Figure 1-5 illustrates the differences in leverage between the various country-categorization groups over the years 1990-2016. Permutation tests are also included, which show the differences in leverage, the size of the stock market and the size of the banking sector every five years. As discussed earlier and now visualized in the chart, the difference in debt-to-equity between the country groups become smaller as time progresses. This is also demonstrated by the permutation tests, which only shows significantly different leverage, among the groups in country-categorization development, the legal system, and culture between 1990-1995. Something that can be seen in figure 1, 3 and 5 respectively.

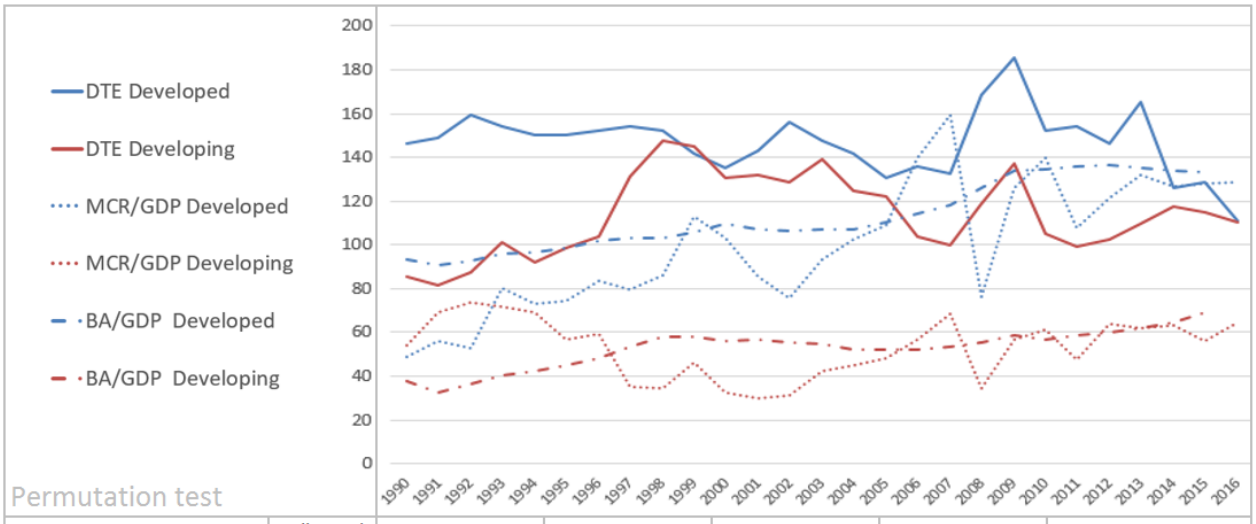
It is noticeable that the country groups with a high initial debt-to-equity ratio decline over time in each country category, while the opposite applies to the country groups with low initial leverage. A possible explanation is that developing countries experienced an unprecedented development in the nineties. Therefore developing countries became more open and integrated with the rest of the world and participated more in international financial markets (Schmukler and Vesperoni, 2001). This may partly explain why the debt-to-equity ratio in developing countries increases toward similar levels as developed countries. However, the decline in developed countries is even larger over the years in this study, while companies in economies with more developed domestic financial systems are less affected by financial integration. A possible explanation for the declining leverage in developed countries is that the ongoing deleveraging of banks reduce the issuance of loans to companies. However, this deleveraging of banks is mainly prevalent after the financial crisis, while the downward trend started before the financial crisis. The converging leverage may, therefore, be the sum of various changing institutional and cultural determinants within countries.

It is also worth noticing that the leverage ratios tend to increase during crisis times, implying that leverage acts counter-cyclical during the crisis. The counter-cyclical leverage is present in almost all country-categorizations, including developing countries. This is most likely the result of financial integration in recent decades, in which financial markets became more global and the spillover effects between countries increased (Schmukler and Vesperoni, 2001). The increase in leverage is only less present in Islamic countries during crisis times. This is probably the result of the lower degree of financial integration in Islamic countries, making these countries less vulnerable to fluctuations in the international financial markets (Karim et al., 2010).

That brings us to the difference in the financial markets between the different country-categorization groups, and how they develop over time. The stock market, as measured by average market capitalization as a percentage of GDP, is almost consistently and significantly higher in developed countries, Market-based countries and Common-law countries. While culture cluster one has only a significantly higher average market capitalization between 1995 and 2000. The graphs show that there is a strong negative correlation between the market capitalization and leverage. For example, the market capitalization declines sharply during the crisis years, while it is already seen that the leverage ratios increase during these years.

The bank sector, as measured by the bank deposit of domestic assets to GDP, is only significantly higher in developed countries and countries with culture cluster one, as shown in figure 1 and figure 5. The graph also shows that the bank sector, in contrast to market capitalization, show a steady growth over the years. Even during the crisis years, the bank sector continued to grow relatively stable. What initiate that the steep rise in crisis years is better explained by the decrease in the market capitalization than the increase in the bank-sector variables. However, as discussed earlier, not the two markets separately but the stock market development in relation to the banking sector may be the first order determinant in predicting leverage. That is why it is interesting how this relates to time. Starting with the country-categorization development. In 1980, the market capitalization accounted for approximately 50% of the GDP in developed countries and in developing countries; by 2016, this share is up to almost 130% developed countries, while it went only up to nearly 70% in developing countries. This while the differences in growth in the bank-sector are only 30% higher in developed countries. This high growth in market capitalization in comparison to the banking sector in developed countries may explain the reduction in leverage over time. However, in the Common-law and Market-based countries, the stock market in relation to the bank sector grow faster than in the Civil-law countries and countries with a Bank-based financial system. While the leverage is declining in Bank-based and Civil-law countries. This contrasting result may be partly explained by outlier Hong Kong, with a Market-based financial system and a Common-law legal system, in which the stock market grows almost 10 times over the time period of this study. But even without Hong Kong, the growth of the stock market relative to the banking sector is comparable. This implies that multiple factors play a role in predicting leverage. The panel regressions may give more insight in this matter.

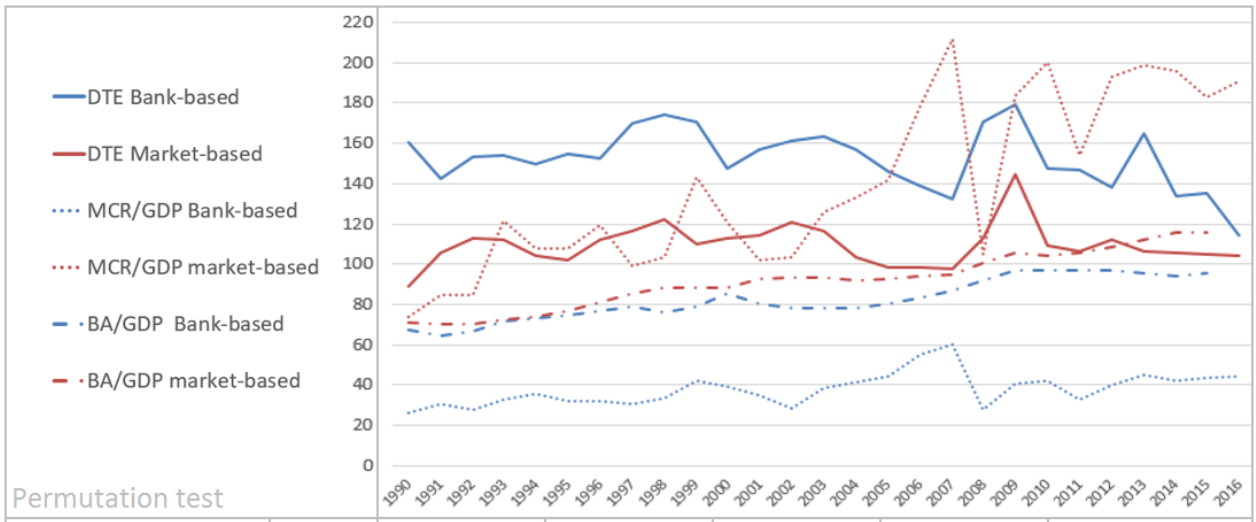
FIGURE 1. CHART + PERMUTATION TEST DEVELOPMENT



Developed vs. Developing	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
Debt-to-equity	0.7924	0.9660**	0.7716	0.8143	0.8281	0.8106
Market Capitalization	0.8919	0.6810	0.9206*	0.9538*	0.8348**	0.8296
Bank sector	0.9768**	0.9838**	0.9646**	0.9698**	0.9822**	0.9212*

Notes: Graph and permutation test for difference between the sample means of developed and developing countries. N= 40 (40 countries) and T= the mean of 27 years (1990-2016). DTE refers to the Debt-to-equity ratio, MCAP refers to the Market capitalization. The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. *Source:* Author calculations.

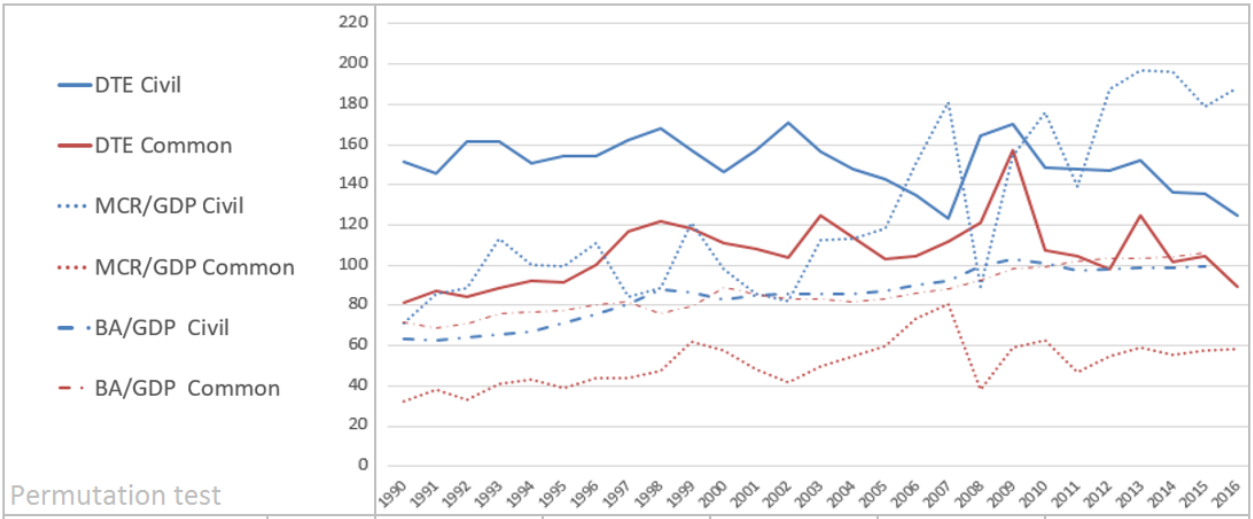
FIGURE 2. CHART + PERMUTATION TEST FINANCIAL SYSTEM



Bank vs. Market-based	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
Debt-to-equity	0.7834	0.6128	0.6562	0.8172	0.8082	0.7704
Market Capitalization	0.0044***	0.0020***	0.0020***	0.0040***	0.0068***	0.0054***
Bank sector	0.4136	0.4612	0.4498	0.3690	0.4000	0.2828

Notes: Graph and permutation test for difference between the sample means of countries with Bank-based and Market-based financial system. N= 40 (40 countries) and T= the mean of 27 years (1990-2016). The abbreviations of the variables can be found in in Appendix 1. The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. *Source:* Author calculations.

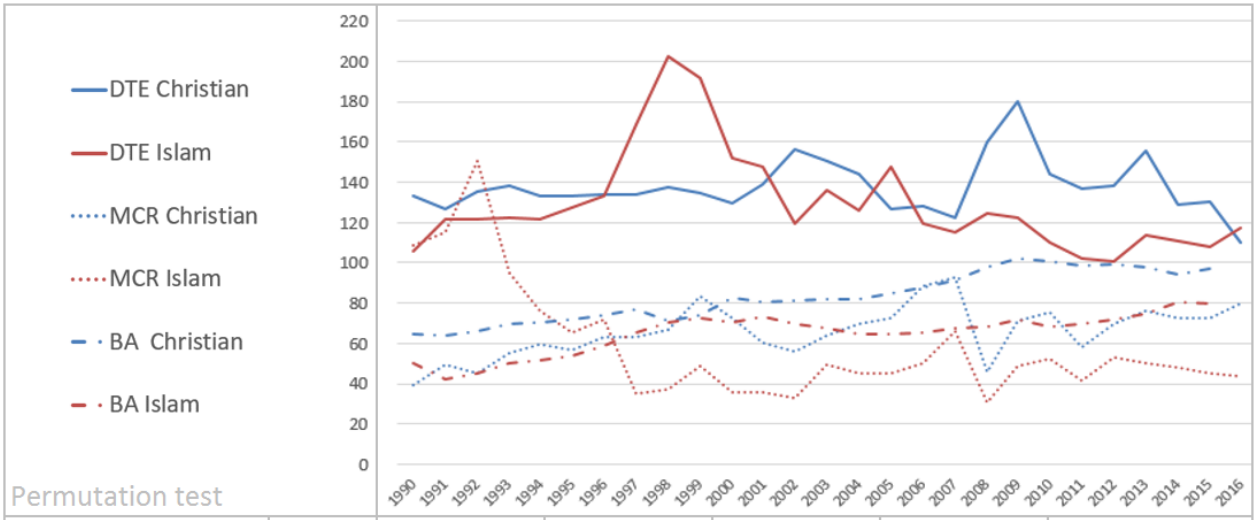
FIGURE 3. CHART + PERMUTATION TEST LEGAL SYSTEM



Civil vs. Common	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
Debt-to-equity	0.8068	0.9352*	0.8560	0.8092	0.7390	0.8138
Market Capitalization	0.0616**	0.0106**	0.0558*	0.0884*	0.0862*	0.0804*
Bank sector	0.5196	0.6120	0.5458	0.5008	0.4620	0.7410

Notes: Graph and permutation test for difference between the sample means of countries with Common-law and a Civil-law. N= 40 (40 countries) and T= the mean of 27 years (1990-2016). The abbreviations of the variables can be found in in Appendix 1. The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. *Source:* Author calculations.

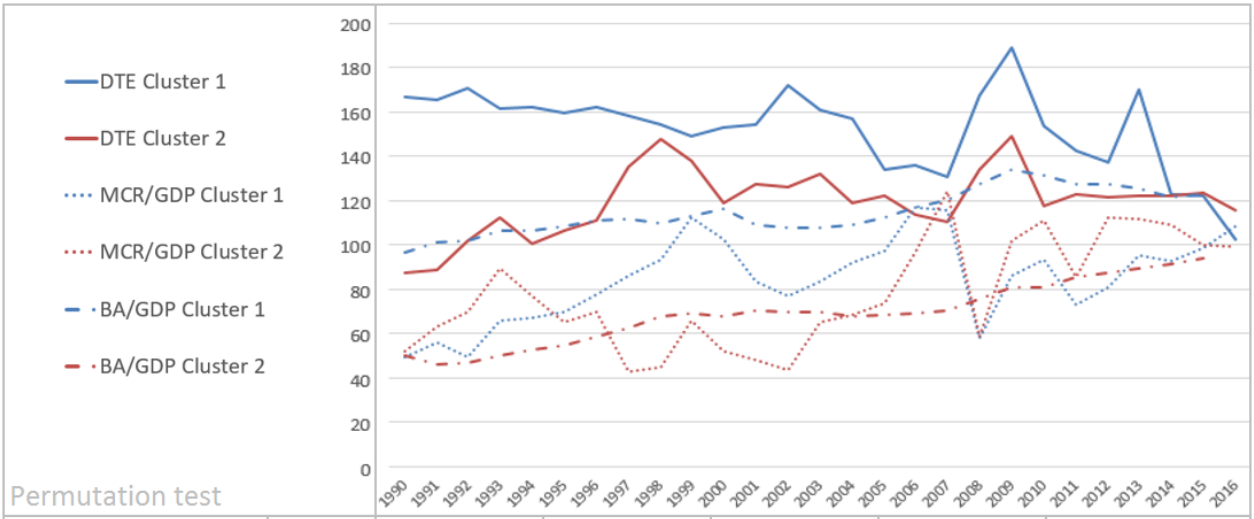
FIGURE 4. CHART + PERMUTATION TEST RELIGION



Cristian vs. Islam	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
Debt-to-equity	0.5806	0.5942	0.3084	0.5602	0.6758	0.6764
Market Capitalization	0.2054	0.1328	0.3890	0.3068	0.2128	0.1708
Bank sector	0.3452	0.3294	0.2676	0.3372	0.4892	0.1566

Notes: Graph and permutation test for difference between the sample means of countries with Christian and Islam religion. N= 40 (33 countries) and T= the mean of 27 years (1990-2016). The abbreviations of the variables can be found in in Appendix 1 The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. *Source:* Author calculations.

FIGURE 5. CHART + PERMUTATION TEST CULTURE



Cluster 1 vs. Cluster 2	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
Debt-to-equity	0.7596	0.9702**	0.8052	0.7442	0.7196	0.6336
Market Capitalization	0.6232	0.7372	0.9178*	0.8312	0.5516	0.5054
Bank sector	0.9050*	0.9680**	0.9352*	0.8946	0.9120*	0.5710

Notes: Graph and permutation test for difference between the sample means of countries with Culture cluster one and Culture cluster two. N= 40 (40 countries) and T= the mean of 27 years (1990-2016). The abbreviations of the variables can be found in in Appendix 1. The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. *Source:* Author calculations.

4.2.3 Permutation test with combined country-categorization groups

There may be a clarification for the insignificant differences between the country-categorization groups in the full sample. For example, simply using Bank-based or Market-based classifications could result in countries, which are classified as one of the financial systems because both markets, the bank-sector, and the stock market, are poorly developed within a country. Another example, Islamic countries in the sample are developing. As a result, developing Islamic countries are compared with countries with a different level of development. It would be interesting to see how the Islamic countries relate to Christian countries with the same level of development. In the same way, other interactions between country-categorizations may yield interesting results. Therefore, separate graphs and permutation tests are included that show the difference in leverage between combinations of the country-categorization groups. These permutation tests and figures are also used to visualize the panel regressions in which the country category groups are included as (interaction) dummies.

Before proceeding with the panel dummy regressions, it is worth noting that there are some interesting results in the graphs with interactions between the country-categorizations groups. For example, figure 6 in Appendix 4 reveals that average debt-to-equity ratio in developed countries

with a Market-based financial system and developing countries, with both a Market-based and a Bank-based financial system, are comparable. Moreover, the chart shows that the debt-to-equity ratio is reasonably stable over the years within these country groups. While the debt-to-equity ratio in developed countries with a Bank-based financial system are remarkably higher in the beginning and declining sharply over the years. A similar trend can be seen in figure 7, in which developed countries with a Civil-law system show a higher initial leverage ratio and a stronger downward trend than the other country-categorization groups. A closer study of the data reveals that eight countries with the steepest decline in leverage over the years are all developed, and all have a Civil-law legal system. Besides, these countries are mostly Bank-based and in Culture cluster one. This indicates that these countries are the prominent reason for the converging leverage over time.

Figure 16 in Appendix 5 shows a comparison between these eight countries and the other countries in the sample. It is striking that the stock market to GDP in comparison to the bank-sector to GDP within this countries grow over 100%, while it remained about the same size in the other countries in the sample. Further research should reveal why it is precisely these countries in which the stock market has increased so much compared to the banking sector.

4.3. Panel regression results

4.3.1 Panel analysis with country-categorization dummies

TABLE 4. PANEL ANALYSIS WITH COUNTRY-CATEGORIZATION DUMMIES

Independent variables		Ex	1	2	3	4	5	6	7	8	9	10
Country Categorizations	Development: Developed	B										
	Development: Developing	-	-0.240	0.069	-0.033	-0.084	-0.067	0.032	0.119	0.011	0.082	0.062
	Fin. System: Bank-based	B										
	Fin. System: Market-based	-	-0.191 *	-0.219	-0.025	-0.396 ***	-0.183	-0.113	-0.396 ***	-0.460 **	-0.211	-0.175
	Legal system: Civil	B										
	Legal system: Common	-	-0.308 ***	-0.231	-0.114 ***	-0.223	-0.427 **	-0.085	-0.312 *	-0.186	-0.382 **	-0.484 ***
	Religion: Christian	B										
	Religion: Islam	-	0.351 *	-0.039	0.007	-0.030	-0.0896	-0.008	-0.451	-0.087	-0.228	-0.213
	Culture: Cluster 1	B										
	Culture: Cluster 2	-	-0.286	-0.221	-0.036	-0.244	-0.211	-0.233	-0.34	-0.356 *	-0.313	-0.351 *
Interactions	Developing # Market-based					0.358						
	Developing # Common						0.426					
	Market-based # Common							-0.302				
	Market-based # Islam								0.891			
	Market-based # Cluster 2									0.407		
	Common # Islam										0.534	
	Common # Cluster 2											0.659
Lagged dependent variable					0.725 ***							
Macro-economic controls				x	x	x	x	x	x	x	x	x
Constant			3.179 ***	4.246 ***	1.285 ***	4.245 ***	4.234 ***	4.227 ***	4.373 ***	4.246 ***	4.292 ***	4.229 ***
N			833	539	527	536	536	536	536	536	536	536
Adjusted R2			0.2496	0.3587	0.7985	0.3827	0.3677	0.3873	0.4062	0.3899	0.3747	0.3791

Notes: logDTE is the dependent variable. N= 40 (40 countries) and T= 27 years (1990-2016). Ex, represent the expected signs for the independent variables, B refers to the base-category. The gray cells are in the interactions. The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

This section presents the empirical tests of the first hypotheses on the differences in capital structure between the country-categorization groups. Table 4 reports the panel regression results on the differences in leverage between the country-categorization groups. The first three columns estimate the equation using no interaction terms, and columns four till ten include interaction terms between the country-categorization dummies. Only interactions that make one of the variables in the interaction significant are included in the regression. Therefore interactions between development and religion, development and culture, and religion and culture are not included. Column (1) only consists of the country-categorization dummies, column (2) also include the macroeconomic control variables, and column (3) adopt a dynamic panel approach, with a lagged dependent variable included. Although the adjusted r-squared improved, and the signs are as expected when the lagged dependent variable is added, the interactions are considered without these lagged dependent variables. This is because the lagged dependent variable suppresses the explanatory power of other independent variables, especially when the interactions are included. The macroeconomic control variables are added to the interaction regressions since it increases the adjusted R-square significantly. The adjusted r-squared in all regressions, except the regression without control variables, are above 35%. This indicates that the model specification captures a good part of the variations. Before proceeding with the results, it should be noticed that the coefficients of the lagged dependent variable in Columns (3) is statistically significant and less than unity. This implies that the leverage ratio is stable and convergent over time, consistence with the trade-off theory.

The regression results presented in column (1) show that almost all signs are negative. This implies that developing countries, Market-based countries, Common-law countries and culture cluster two countries have lower debt-to-equity ratios than the counterpart country-categorizations. This is in line with the expectations that developed countries, Bank-based countries, Civil-law countries and Culture cluster one countries have higher leverage ratios. However, only the differences between the two financial systems and the two legal systems are significant. This implies that the differences between developed and developing countries and the two culture clusters are not robust enough to support the hypotheses 1A and 1E. Column (2) reports that when control variables are added, the difference between two financial system and the two legal systems become also insignificant. However, column (3) shows that the differences between the two legal systems are significant when the lagged dependent variables are added alongside the

macroeconomic control variables. Furthermore, it is remarkable that the results in column (1) show that Islamic-majority countries have significant higher debt-to-equity ratios than Cristian-majority countries. This is in contrast with the hypothesis 1D that Christian-majority countries have higher debt-to-equity ratios. However, the sign becomes positive when the controls are added in column (2). Therefore, the difference between Christian and Islamic countries is not robust enough to support hypothesis 1D.

Overall, the regression estimates support the idea that there is a significant difference in the debt-to-equity ratio between companies located in countries with Civil-law and a Common-law legal system, and Bank-based and Market-based financial systems. This findings would support hypothesis 1B and 1C. However, it is difficult to disentangle, as there is a high correlation between the two country-categorizations. An interaction term between the two financial markets and the two legal systems is included in column (6). The interaction term is, besides the Market-based dummy and the Bank-based dummy separately, also negative.[12] This implies that Bank-based countries with a Civil-law legal system have the highest debt-to-equity ratio, while Market-based countries with a Common-law legal system the lowest debt-to-equity ratio. Table 4, shows that the average leverage in Bank-based Civil-law countries is 158.7 and in Market-based Common-law countries 98.4, while Bank-based Common-law countries and Market-based Civil-law countries are somewhat in the middle with ratios of 117.5 and 123.5 respectively. This results reinforces the indication that a Bank-based financial system and a Civil-law legal system both provide higher debt-to-equity ratios.

TABLE 5. DEBT-TO-EQUITY IN COUNTRY-CATEGORIZATION COMBINATIONS

	Development		Financial system		Legal system		Religion	
	Developed	Developing	Bank-based	Market-based	Civil-law	Common-law	Christian	Islam
Bank-based	175.3	112.8						
Market-based	111.6	106.6						
Civil-law	177.6	107.6	158.7	123.5				
Common-law	99.6	113.9	117.5	98.4				
Christian	157.1	99.8	155.5	102.6	151.7	104.2		
Islam		122.5	111.5	133.6	121.8	123.2		
Cluster 1	156.5	91.0	185.2	110.1	188.4	106.0	152.9	
Cluster 2	133.8	111.6	123.6	108.9	124.5	107.4	114.7	122.5

Notes: N= 40 (40 countries) and T= the mean of 27 years (1990-2016). Source: Author calculations.

[12] Although column 6 shows no direct significant results, the difference between bank-bank Civil-law countries and Market-based Common-law countries is significant.

Besides the interactions between the two financial systems and the two legal systems, there are many other interactions included that are worth noticing. Column (4) and (5) in table 4 show that the difference between developed and developing countries is insignificant in all interactions. This implies that the results are also not robust enough to support hypothesis 1A in a sample with interactions. Column (4) till (10) shows that Bank-based have a significantly higher debt-to-equity ratio than Market-based countries in a sample with developed countries, Christian-majority countries and countries with culture cluster one. While column (2) already reported that the differences between the two financial systems are not significant in a full sample with control variables. This is most likely the result of the small differences in leverage within developing countries, Islamic countries and culture cluster two countries.[13,14,15] This suppresses the difference between the two financial systems in the full sample. Table 4 shows that the differences between Civil-law and Common-law countries are significant in the same country-categorization groups as the difference between Bank-based and Market-based countries. This is most likely the result of the high correlation between the two groups. The results of the financial system and legal system interactions strengthen the support for hypotheses 1B and 1C. The results in column (7) and (9) show no significant difference between Christian-majority and Islamic-majority countries in all country-categorization groups combinations. Therefore hypothesis 1D is also not supported in a sample with interactions.

Lastly, column (8) and (10) reports that there is a difference between Cultural cluster one and Cultural cluster two in Bank-based countries and countries with a Civil-law legal system. A possible explanation that the result is not significant in the full sample, but is in a sample with only Bank-based or Civil-law countries, is that the differences within Market-based or Common-law countries are small regardless of their other differences in institutional and cultural factors.[11,13] Therefore, hypothesis 1E is not supportive in the full sample, but is in the sample with only Bank-based countries and countries with a Civil-law legal system.

[13] Table 5 shows that differences between the country-categorization groups in developing, Market-based countries, Common-law countries, Islamic-majority countries and countries with culture cluster two are at least 1% (123.2 / 121.8) and at most 26% (123.5 / 98.4) , while the differences between the country-categorization groups in developed, Bank-based countries, Civil-law countries, Cristian-majority countries and countries with culture cluster one are at least 25% (151.7 / 121.8) and at most 78% (177.6 / 99.6).

[14] This is the main reason why the developed, Bank-based, Civil-law, Christian, and culture cluster one countries are included as reference category. In a separated set, not shown in this study, the counterpart country-categorizations are included as reference. However, only the interaction between the financial system and the legal system are significant in this set. This is because these interaction terms compare the differences in the debt-to-equity ratio in country categorization in which the institutional and cultural differences are smaller, i.e. development, Market-based, Islamic and cultural cluster one country.

[15] This smaller differences are also shown in the permutation test in figure 6 to 15 in appendix 4.

Some problems that are discovered in this study are partially remedied in table 4. For example, it is already noted that some countries, such as Indonesia, are Bank-based at the beginning of sample period, while they are Market-based at the end of the sample period and vice versa. This problem is addressed by comparing the countries with the highest score on the index of the financial structure with the countries with the lowest score on the index of the financial structure. In this case, the first quartile of countries are compared with the last quartile of countries. As a result, the countries that are somewhat in the middle, and therefore not clearly Market-based or Bank-based countries or vary over time, are not included in this panel regression. An additional dummy variable conglomerate Indexes of Financial Structure (CIFS) is created that takes the value one when the country scores at the highest quartile on the index, and value zero if it scores at the lowest quartile on the index. Besides, for robustness, the first and last quartile of developed and developing countries are also compared. Therefore, dummy variable development (DEV) is created that takes the value one when the country belongs to the highest quarter of development, and value zero if it belongs to the lowest quarter of development. For the legal system and the religion of a country, it gives the possibility to compare the differences between the Civil-law legal systems and the two Christian religions. This also provides answers to hypotheses $1C_2$ and $1D_2$.

TABLE 6. PANEL ANALYSIS WITH DUMMIES AND PERCENTILES

Independent variables			Ex	1	2	3	4
Country Categorizations	Development	Developing	-		-0.352 ***	-0.025	-0.048
		DEV	+	-0.104			
	Fin. System	Market-based	-	-0.084		-0.022	-0.006
		CIFS	-		-0.022		
	Legal system	Common	-	-0.098	-0.005		-0.074 *
		Civil French	-			-0.041	
	Religion	Islam	-	0.150	-0.027	-0.000	
		Protestant	-				-0.006
	Culture	Cluster 2	-	-0.005	-0.093	-0.025	-0.012
Macro-economic controls				x	x	x	x
Lagged dependent variable				x	x	x	x
Constant				1.237 *	1.808 ***	1.238 ***	1.212 ***
N				272	224	527	618
Adjusted R2				0.781	0.8068	0.7987	0.7942

Notes: logDTE is the dependent variable. N= 40 (40 countries) and T= 27 years (1990-2016). Ex, represent the expected signs for the independent variables. The gray cells represent the difference between the first and last quartiles, the French Civil-law dummy and the Protestant dummy. The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

In Column (1) the dummy variable developing is replaced by dummy variable CIFS, and in column (2) dummy-variable Market-based are replaced by dummy variable DEV. In Column (3) and column (4) the Common-law dummy and the Islam dummy are replaced with the Civil French and the Protestant dummies respectively. Appendix 2 panel A2 - D2 shows the differences in leverage between these dummy variables.

Column (1) reports that countries within the highest quartile of development have lower debt-to-equity ratios than countries with the lowest quarter of development. This is a remarkable result, as panel A2 in Annex 2 shows a much higher leverage ratio for developed countries. However, beside the initial differences in the development this difference is also insignificant. Column (2) reports that although the coefficient increased slightly, compared to the equation in the full sample, it is still insignificant when the control variables and the lagged dependent variables are included. Column (3) reports the difference between French Civil-law and the other two Civil-law systems. The result indicate that German and Scandinavian Civil-law countries have higher leverage ratios than French Civil-law countries. This is in line with the expectation, as the panel C2 is to see that German and Scandinavian Civil-law countries have significantly higher creditor protection. However, the results are not significant. Therefore hypothesis $1C_2$ is not supported.[16] Column (4) reports the difference between Catholic and Protestant countries. It can be seen that Protestant countries have lower debt-to-equity ratios than Catholic countries. This is in line with the findings of Baxamusa and Jalal (2014) that Catholic countries have higher debt-to-equity ratios. However, also these results are not significant. Therefore hypothesis $1D_2$ is also not supported.

[16] In a separate set, not shown in this study, it is shown that French Civil-law and other Civil-law countries both have significantly higher leverage than Common-law countries. For this reason it could be argued that Common-law countries have the lowest average leverage ratios, than French Civil-law and then the other two Civil-law countries. Only the differences between the two Civil-law countries is insignificant.

4.3.2 Panel analysis with country-specific factors

TABLE 7. PANEL ANALYSIS WITH COUNTRY-SPECIFIC FACTORS

Independent variables			Ex	1	2	3	4	5	6	7	8	9
Country Categorizations	Development	logGDPpc	-	-0.087	-0.128	-0.010						
		HDI	-				-0.473 ***	-0.271	-0.382 **	-0.492 ***	-0.387 **	-0.468 ***
	Fin. System	logMCR / GDP	-	-0.135 **	0.494 ***	0.171 ***	-0.098 ***	-0.102 ***		-0.119 **		-0.095 ***
		logSTR / GDP	-						-0.011	0.021 **		
		logTR	-								0.029 **	0.028 **
		logBA / GDP	+	0.506 ***	0.494 **	-0.096 ***	0.197 ***		0.130 **	0.021 **	0.129 ***	0.197 ***
		logBC/GDP	+					0.116 ***				
	Legal system	SRP	-	0.033	0.046	-0.007	-0.008	-0.009	-0.010	-0.008	-0.008	-0.009
		CRP	+	-0.155 **	-0.121	-0.017	-0.017	-0.001	-0.008	-0.013	-0.004	-0.015
	Religion	CAT	+	-0.003	0.037	0.032	0.037	0.035	0.040	0.062	0.087 **	0.070
		PRO	-	-0.100	-0.089	-0.006	-0.011	-0.074	-0.040	0.001	-0.004	0.016
		ISL	-	0.209	0.089	0.025	0.008	0.001	0.054	0.003	0.038	0.002
	Culture	IDV	+	-0.003	-0.002	-0.001 *	-0.001	0.000	-0.000	-0.001	-0.001	-0.001
		PDI	-	-0.012 ***	-0.011 ***	-0.002 **	-0.003 ***	-0.002 *	-0.003 ***	-0.003 ***	-0.003 ***	-0.003 ***
		MAS	-	-0.003	-0.003	-0.002 **	-0.002 **	-0.002 *	-0.002 **	-0.002 **	-0.002 *	-0.002 **
		UAI	-	0.002	0.002	0.000	0.001	0.000	0.001 *	0.000	0.001	0.000
Lagged dependent variable						x	x	x	x	x	x	x
Macro-economic controls					x	x	x	x	x	x	x	x
Constant				4.831 ***	5.113 ***	1.255 ***	1.479 ***	1.458 ***	1.118 ***	1.577 ***	0.740 ***	1.453 ***
N				784	611	596	596	555	623	593	588	588
Adjusted R2				0.3529	0.3561	0.7964	0.7977	0.7777	0.780	0.7983	0.7912	0.800

Notes: Dependent variable= leverage, N= 40 (40 countries) and T= 27 years (1990-2016). Ex, represent the expected signs for the independent variables. Definitions of the variables used are defined in Appendix 1. The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

Table 7 reports the results of the panel analysis with country-specific variables representing the underlying value of the country-categorization. It is clear that GDP per capita has a negative, but insignificant, relationship with the capital structure in the first three regression. Thus, GDP per capita is not robust in predicting capital structure of firms. In column (4) till (7) GDP per capita is replaced with the HDI. It is remarkable that HDI is significantly negatively related to leverage in most of the columns. Therefore, GDP alone is not significantly associated with lower leverage, but a complete measure of development that also includes education and public health is. Indicating that higher development may portray growth for firms and increase retained earnings, as suggested by Bokpin (2009) and Dincergok and Yalciner (2011). Therefore hypothesis 2A is partly supported. This is in contrast with the fact that developed countries have higher initial leverage than developing countries. A possible explanation for this is that despite the higher initial leverage in developed countries, further development leads to substitution of debt for equity. Another possible explanation is that institutional and cultural differences between developed and developing countries may have a more significant impact on leverage than the GDP per capita and HDI.

On the financial system variables, market capitalization to GDP is significantly negatively related to leverage. Since the market capitalization measures the size of the stock market, one robust

finding is that countries with larger stock markets have smaller debt-to-equity ratios. While column (6) shows that shares traded to GDP is insignificant negatively related to leverage. Only when the market capitalization and the value traded are performed in the same regression, as shown in column (7), the coefficient of the value traded becomes positive and significant. Also, the turnover ratio, the measure of the efficiency of the stock market is positively related to leverage.[17] Both with and without the inclusion of the market capitalization, as shown in column (8) and (9). Thus, the size of the stock market is negatively related to leverage, while the activity and efficiency are positively related to leverage. Generally, stock market size has a more significant impact on leverage than activity and efficiency, meaning the outcomes are in line with hypothesis 2B. Furthermore, in all regressions bank deposited of domestic assets are associated with an increase in the debt-to-equity ratio, or substitution of equity for debt. In column (6), in which bank deposited of domestic assets to GDP is replaced with bank credit to GDP, the coefficient is also positive and significant. This indicates that when a country's bank sector is further developed, firms have more choice for borrowing and are willing to take in more debt as suggested by (de Jong, Kabir and Nguyen, 2008). This is also in line with hypothesis 2B. The fact that banking variables are associated with a rise in the debt-to-equity ratio, while stock market variables are generally associated with a fall in that ratio is in line with the fact that Bank-based countries have higher leverage than Market-based countries.

Creditor and shareholder rights are examined for the underlying variables representing the differences in the legal system of a country. The main insight that emerges from this analysis is that creditor protection is negatively related to leverage, consistency with Cho et al. (2014). Implying that strong creditor rights lead to decreasing leverage. However, the findings are only significant it the regression without control variables. Also, shareholder rights are not significantly related to leverage. Thus, shareholder protection and creditor protection are not robust in predicting capital structure. Therefore, hypothesis 2C is not supported. However, there might also be an indirect effect of these two variables. For example, La Porta et al. (1997) argue that better shareholder protection leads to higher stock market development, and stock market development

[17] This positive association between value traded and turnover and leverage is most likely the result of the positive correlation between the bank sector variable and these variables. Therefore, more active an efficient stock markets leads to a larger and more active bank-sector, as suggested by Demirgüç-Kunt and Maksimovic (1999).

leads in there turn to lower leverage ratios. This indirect effect may, therefore, be the reason for the higher debt-to-equity ratio within Civil-law countries, as in Common-law countries.

The signs of coefficients of Catholic religiosity, Protestant religiosity and Islamic religiosity fluctuate considerably and are almost consistently insignificant. Therefore hypothesis 2D is not supported. A possible explanation for these insignificant results is that the population of a country can have a particular religion, but people in different countries can experience religion differently. For example, Eurostat, the statistical office of the European Union, which examined the religion of the EU population as part of the Eurobarometer, showed that the majority of the EU population is religious, but only twenty-one percent experience this as important. Another possible explanation is that static data, and therefore does not track the religiosity over time. As a result, this study only compare the difference in leverage with regard to the religion between the different countries, not how it relates to leverage within a country over time.

Table 7 also shows that high Individualism leads to a lower use of leverage. Indicating that managers who are concerned about their reputation, choose lower debt levels to maximize success and enhance their reputation rather than maximizing profits, as suggested by Hirshleifer and Thakor (1992). However, the coefficient is only significant in column (3), and therefore not robust. High Power Distance has a negative and statistically significant relationship with the capital structure. This implies that high Power Distance is associated with low levels of trust and more opportunistic behavior (Zheng et al., 2012). This results in higher transaction costs that discourage companies to take on debt. Therefore companies would take on more equity. Companies located in countries with high Masculinity appear to be less leveraged, consistent with Zheng et al. (2012) argument that when managers care about their own performance, they choose safer projects with a higher probability of success, and therefore choose lower debt-ratios. Finally, it remarkable that Uncertainty Avoidance positively associated with leverage, as debt financing is expected to increase the uncertainty. However, the coefficient almost consistently insignificant. Therefore, only higher Power Distance and higher Uncertainty Avoidance are significant negative related to leverage. This is in line with the higher leverage in countries with culture cluster one than in culture cluster two, as the latter has significant higher Masculinity.[18]

[18] As shown by the permutation test in table 2

4.3.3 Panel analysis with separate country-categorizations

TABLE 8. PANEL DATA REGRESSION WITH DUMMIES IN SEPARATE COUNTRY-CATEGORIZATION

Country categorization		Development		Financial system		Legal system		Religion		Culture	
Independent variables	Ex	Developed	Developing	Bank	Market	Civil	Common	Christian	Islam	Cluster 1	Cluster 2
logGDPpc	-	0.026	-0.033	0.012	-0.005	0.005	-0.013	-0.023	-0.040	0.012	0.008
logMCR / GDP	-	-0.112 ***	-0.128 ***	-0.120 **	-0.079 ***	-0.101 ***	-0.083 **	-0.101 ***	-0.132	-0.091 ***	-0.116 ***
logSTR / GDP	-	0.021 *	-0.017	0.026	0.008	0.013	-0.002	0.013	0.035	0.009	0.016
logBA / GDP	+	0.138 ***	0.136 ***	0.133 **	0.128 ***	0.098 **	0.164 **	0.225 ***	0.046	0.138 ***	0.110 ***
Lagged dependent variable		0.749 ***	0.715 ***	0.713 ***	0.782 ***	0.762 ***	0.658 ***	0.700 ***	0.661 ***	0.716 ***	0.762 ***
Macro-economic controls		x	x	x	x	x	x	x	x	x	x
Constant		0.744 **	0.1418 ***	0.950 ***	0.871 ***	0.857 ***	0.1349 **	0.104 ***	0.2062 **	0.110 **	0.928 ***
N		355	260	331	284	400	215	415	73	290	325
Adjusted R2		0.2009	0.2137	0.2125	0.1713	0.1974	0.2159	0.1848	0.1956	0.1869	0.1952

Notes: N= 41 (41 countries) and T= 27 years (1990-2016). The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

This section discusses whether the relation between GDP per capita and the financial market variables and leverage vary across different country categorizations. Table 8 shows that the coefficient of GDP per capita is never significant in explaining leverage. Once again confirming that GDP per capita is not robust in predicting leverage. For the financial market variables, the market-capitalization to GDP are significantly negative related with leverage almost all country-categorization. While shares traded to GDP is only significantly positive related to leverage in developed countries. Implying that more activity in stock markets that are already developed, leads to a substitution of equity for debt financing. While this does not count for developing countries and other country-categorization groups. Furthermore it is remarkable that all financial market variables are insignificant in the regression with only Islamic countries. This indicate that besides lower degree of financial integration which leads to lower association between leverage and the international financial markets, as discussed earlier. There is also a lower association between the domestic financial markets and the leverage ratios in Islamic countries.

Table 8 also tests whether firms in the different country-categorizations approach capital structure adjustments differently. The results in table 8 report that the estimates of lag leverage are statically significant in each of the columns. This implies that the leverage ratio converts toward a target leverage ratio over time, as proposed by the trade-off theory. It is shown that firms located in Common-law countries adjust their leverage more quickly to the target than other country-categorization groups.[19]

[19] This is in sharp contrast with the argument of Bancel and Mittoo (2004) who found that managers in Civil-law systems have much higher concerns about maintaining a target debt-to-equity ratio. This is according to them because the potential bankruptcy costs are higher in systems with worse creditor protection. Baxamusa and Jalal (2014) have a possible explanation. They argue that if the firm's leverage is above the target, then more debt-averse firms should more quickly adjust toward the target. Similarly, if the firm's leverage is below target, then a more debt-averse firm should more slowly adjust toward the target. Further research should, therefore, split the data into groups based on abnormal leverage.

5. Conclusion

This study analyzes the differences in capital structure between different country-categorizations over the period 1990-2016 using a dynamic panel approach with aggregate firm-level data. The aim is to explain the cross-country variation in the capital structure by the level of development, the financial systems, the legal systems, the religion and the culture of a country. Firstly, it is examined whether there are systematic differences in leverage between different country-categorization groups. Secondly, it is investigated what the underlying country-specific variables of the country-categorizations are and how they relate to leverage.

The results imply that countries with a Bank-based financial system have significantly higher leverage ratios than countries with a Market-based financial system and that countries with a Civil-law legal system have significantly higher leverage ratios than countries with a Common-law legal system. When interactions are included between the various country-categorization groups, the results also imply that *culture cluster one* countries (characterized by high Individualism and low Power Distance), have significantly higher leverage ratios than *culture cluster two* countries (with low Individualism and low Power Distance) in a sample with Bank-based or Civil-law countries. Mainly developed Civil-law countries, which are also largely Bank-based and in *culture cluster one*, have high leverage ratios. Especially in these countries the leverage decreases with the passage of time. As a result, the differences in leverage also decrease over time.

When analyzing the impact of the country-specific variables on leverage, the evidence generally suggests that stock market variables facilitate the issuance of equity, leading to lower leverage ratios in a country, while the bank sector variables have the opposite effect. This is in line with the findings that Bank-based countries have higher leverage ratios than Market-based countries, and that Civil-law countries have higher leverage than Common-law countries, as Bank-based countries and Civil-law countries have smaller stock markets relative to the bank-sector. The results also imply that Power Distance and Masculinity are significantly negatively related to leverage. These results are consistent with the findings that *culture cluster one* countries with lower Power Distance, have higher leverage ratios than *culture cluster two* countries with high Power Distance. In addition, the Human Development Index (HDI), as a measure of a country's development, also has a significantly negative impact on leverage. This indicates that the development of a country, institutional factors, and cultural factors affect the leverage ratios in countries.

Studies that directly compare the differences in capital structures between country-categorizations groups are limited. For example, differences in the debt-to-equity ratio between Market-based and Bank-based systems have not yet been investigated. Moreover, a comparison is made between religions, but not between the two major religions, i.e., Christian and Islam. Furthermore, no study makes an intercontinental comparison between country groups with the same cultural characteristics. This study sheds further light on this limited or non-existing literature. Moreover, the differences between the country-categorization groups in the current literature are mostly examined separately. This study combines the country-categorizations, which offers the possibility to include interactions between the country-categorization groups. This gives an even greater international comparison. This is the first study that investigates how HDI relates to leverage, which offers a more complete measurement of the development of a country than Gross Domestic Product (GDP) alone. Finally, previous studies focus on a sample up to the beginning of the 2000s, while this study include data up to 2016. This is a noticeable contribution, as this study shows that the difference in leverage between the groups significantly decreased after the 2000s.

There are important practical implications of the results presented in this study. The findings may be useful for companies, investors, investment banks and policymakers in shaping their responses to different situations. For example, companies in debt-dependent country-categorizations are affected more by shocks in the supply of debts in the economy or any sustained inflationary pressures, than companies in more equity-dependent country-categorizations (Baxamusa and Jalal, 2014). Companies can use this information to make effective capital structure decisions for financial stability and sustainable growth (Mokhova and Zinecker, 2013). Investors can exploit the findings of this study, regarding the leverage of the companies located in different country-categorizations, to form appropriately diversified portfolios, and investment banks may benefit if they target their Initial Public Offering (IPO) to firms located in more equity-dependent country-categorizations. Demirgup-Kunt and Maksimovic (2002) argue that a country can partially compensate for the effect of the deficiency of the legal systems on banks through a combination of administration and regulation of the banking system. In the same way, Merryman (1985) argues that cultural traits can partially be counter-balanced by rules and regulations. Policymakers can, therefore, adopt policies that facilitate robust financial markets and institutions. For example, developing countries could adopt policies that better protect shareholder rights and increase stock market efficiency to encourage greater stock market participation (Stulz and Williamson, 2003).

There are several limitations to this study. Firstly, categorization schemes are useful for analysis, but they all come with a set of constraints and biases. Secondly, a significant problem in the cross-country research is that differences in accounting and disclosure practices make it difficult to compare and interpret financial data across countries. Thirdly, it is almost impossible to collect data on the evolution of the legal system, religion and culture in a country over time. Lastly, this study focuses mainly on large companies in the countries. This study is therefore subject to large-firm bias.

Further research should further investigate why the leverage ratio declines in developed countries with a Civil-law system as time progresses. In addition, further work may include time-series data for the country-specific variables representing the legal system, religion and the culture of a country. Especially the shareholder protection and the adherence of a religion seem to vary considerably over time. Moreover, a subsequent investigation may include the importance of religion in a country in addition to the adherence to a religion. Finally, further studies might also include smaller companies.

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7. Appendix

Appendix 1 – Descriptive statistics

Name (abbreviation)	Code	Description	Statistics			
			Obs.	Mean	Median	S.D.
Dependent variable:						
Debt-to-equity	DTE	Total debt as a percentage of the book value of equity	1019	133.86	115.55	69.43
Country categorization dummies						
Developing country dummy	DC	A dummy variable taking on value 1 if the the country is developing and 0 if it is developed (Sources: IMF, in the "World Economic Outlook").	1080	0.45	0	0.50
Market based country dummy	MB	A dummy variable taking on value 1 if the country's financial system is market-based and 0 if it is bank-based. (Sources: own calculations based on the Conglomerate Indexes of Financial Structure of Demirgüç-Kunt and Levine, 1999).	1080	0.4	0	0.49
Common-law country dummy	CL	A dummy variable taking on value 1 if the the country has a common-law legal system and 0 if a has a civil-law legal system (Sources: La Porta et al., 1997; supplemented with CIA World Factbook)	1080	0.4	0	0.49
French Civil-law dummy	FC	A dummy variable taking on value 1 if the the country has a French civil law legal system and 0 if a has a German or scandinavian civil-law legal system (Sources: La Porta et al., 1997; supplemented with CIA World Factbook)	702	0,31	0	0,46
Islamic country dummy	IS	A dummy variable taking on value 1 if the the country is islamic and 0 if the country is Cristian (Sources: for Cristian countries: as defined by Baxamusa and Jalal, 2014: for islamic countries: as defined by La Porta et al., 1997; supplemented with CIA World Factbook)	891	0,18	0	0.47
Protestant country dummy	PR	A dummy variable taking on value 1 if the the country is protestant and 0 if the country is Catholic (Sources: as defined by Baxamusa and Jalal, 2014; supplemented with CIA World Factbook)	729	0,3	0	1
Culture cluster 2 dummy	CC2	A dummy variable taking on value 1 if the the country is in culture cluster 2 and 0 if it is in cultural cluster 1 (Sources: cultural cluster groups as defined by Hofstede, 2001, p.62)	1080	0.6	1	0.49
Country specific variables						
GDP per capita	logGDPpc	Defined as the log of the average of annual real GDP per capita. (Source: World Development Indicators).	1075	19603	14001	18594
Human Development Index	HDI	UNDP's Human Development Index based on various indicators in addition to the measurement related to income, including education and health. (Source: World Development Indicators).	1012	0.77	0,8	0.13
Market capitalization ratio / GDP	logMCR/GDP	Log of the value of the listed shares to GDP. This measure is used to measure the total size of the market. (source: World Federation of Exchanges database).	942	81.64	48.83	123.16

Time -series

Time -series	Total value of shares traded ratio / GDP	logSTR/GDP	Log of the value of shares traded on the stock market exchange to GDP. This measurement is use to measure the activity of the market. This measurement complement MCR as there may be little trading on large markets (source: World Federation of Exchanges database).	1010	45.78	20.26	77.39
	Turnover ratio	logTR	Log of the value of total shares traded divided by the value of shares listed. This measure is used to measure the efficiency of the market. It compliments Market caiptalization cas a large but inactive market will have a large MCR but a small TR and it compliments value traded as it measures trading is terms of the stock market instead of the size of the economy. A small, liquid market will have a high TR but a small total value traded ratio. (source: World Federation of Exchanges database).	926	59.57	40.37	64.11
	Bank deposite of domistic assets / GDP	logBA/GDP	Log of the ratio of banks deposit of domestic assets of deposite money banks to GDP. This ratio is used as an indicator of the size of the banking sector (source: World Bank)	1016	85.14	78.9	49.78
	Bank credit / GDP	logBC/GDP	Log of the deposit money bank credit to the private sector to GDP. This ratio is an indicator as defined by (e.g., Beck and Levine, 2002, 2004; Levine and Zervos, 1998) (source: World Bank)	963	81.29	79.66	53.14
Static	Shareholder right protection	SRP	Shareholder right protection, an index aggregating different shareholder rights as defined by La Porta et al. (1998). (Source: La Porta et al., 1998).	999	6.42	6.3	0.96
	Creditor right protection	CRP	Creditor right protection, an index aggregating different creditor rights as defined by La Porta et al., 1997. (Source: La Porta et al., 1997 and Claessens and Klapper, 2002).	1080	2.08	2	1.19
	Catholic Religiosity	CAT	Percentage total adherents to Catholicism in a country by the total population of that country (Source: CIA World Factbook)	1080	35.22	23.55	32.01
	Protestant Religiosity	PRO	Percentage total adherents to Protestant in a country by the total population of that country (Source: CIA World Factbook)	1080	8.59	0	13.13
	Islamic Religiosity	ISL	Percentage total adherents to Islamic in a country by the total population of that country (Source: CIA World Factbook)	1080	14.44	4.2	26.82
	Individualism	IDV	Individualism versus collectivism (source: Hofstede, 2001)	1080	46.88	39	24.48
	Power distance	PDI	Power Distance represents inequality (more versus less). (source: Hofstede, 2001)	1080	58.1	63	19.73
	Masculinity	MAS	Masculinity versus Femininity (source: Hofstede, 2001)	1080	51.35	55	18.33
	Uncertainty avoidance	UAI	Uncertainty Avoidance deals with a society's tolerance for uncertainty and ambiguity (source: Hofstede, 2001)	1080	64.33	64.5	22.09
Control variables:							
	Macro-economic control variables	MCV	Gross domestic product, Foreign Direct Investment, Investment, Trade (source: World bank)				

Appendix 2 – Country-categorizations

Panel A: Development

Country	DTE	GDP	HDI
Kenya	65.3	670	0.49
Pakistan	200.5	771	0.48
Ghana	130.7	781	0.51
Nigeria	102.5	1080	0.49
Philippines	98.7	1518	0.63
Sri Lanka	111.8	1646	0.70
Indonesia	159.3	1764	0.61
Peru	83.7	3321	0.68
Thailand	148.6	3414	0.66
South Africa	91.0	4630	0.63
Lebanon	82.4	5726	0.75
Malaysia	85.2	6068	0.73
Brazil	148.7	6287	0.69
Turkey	133.6	6617	0.67
Mexico	116.0	7064	0.71
Poland	76.4	7640	0.79
Argentina	114.7	8067	0.77
Chile	72.4	8076	0.78
Developing	113.8	4174	0.65
Portugal	214.3	16137	0.79
Korea. Rep.	178.4	16421	0.83
Slovenia	84.2	17915	0.83
Greece	142.9	18185	0.82
Spain	170.8	22220	0.83
New Zealand	107.3	24631	0.87
Italy	238.5	27994	0.84
Hong Kong	71.6	28071	0.85
France	149.1	31819	0.85
Singapore	74.2	32447	0.83
Canada	121.1	33012	0.88
United Kingdom	103.1	33504	0.87
Belgium	157.6	33632	0.87
Germany	208.6	33930	0.87
Australia	91.4	34660	0.91
Austria	249.1	35869	0.85
Netherlands	139.6	37141	0.88
Japan	145.0	37190	0.86
Ireland	161.8	38075	0.86
United States	66.7	40181	0.89
Switzerland	158.2	56742	0.89
Norway	250.0	58925	0.91
Developed	149.2	32213	0.86

Panel B: Financial system

Country	DTE	INDEX	M / A	T / C	T * O
Lebanon	82.4	-1.37	0.16	0.03	0.00
Austria	249.1	-1.21	0.20	0.11	0.00
Slovenia	84.2	-1.16	0.36	0.04	0.00
New Zealand	107.3	-1.08	0.35	0.08	0.00
Portugal	214.3	-0.97	0.31	0.16	0.00
Ireland	161.8	-0.87	0.53	0.11	0.00
Greece	142.9	-0.82	0.45	0.23	0.01
Ghana	130.7	-0.80	0.67	0.04	0.00
Japan	145.0	-0.80	0.38	0.34	0.01
Kenya	65.3	-0.75	0.71	0.06	0.00
Sri Lanka	111.8	-0.72	0.66	0.10	0.00
Germany	208.6	-0.64	0.33	0.49	0.01
Poland	76.4	-0.55	0.57	0.26	0.00
Norway	250.0	-0.52	0.50	0.34	0.00
Belgium	157.6	-0.49	0.59	0.27	0.00
Italy	238.5	-0.45	0.41	0.48	0.01
Argentina	114.7	-0.43	0.58	0.34	0.00
Thailand	148.6	-0.43	0.53	0.39	0.01
Spain	170.8	-0.41	0.47	0.56	0.01
Indonesia	159.3	-0.37	0.79	0.29	0.00
France	149.1	-0.24	0.61	0.52	0.01
Nigeria	102.5	-0.12	1.04	0.13	0.00
Brazil	148.7	-0.06	0.73	0.43	0.01
Mexico	116.0	-0.05	0.91	0.39	0.00
Bank-based	147.3	-0.54	0.53	0.26	0.00
Netherlands	139.6	0.03	0.73	0.63	0.01
United Kingdom	103.1	0.10	0.87	0.56	0.01
Australia	91.4	0.26	0.97	0.62	0.01
Malaysia	85.2	0.29	1.29	0.33	0.00
Canada	121.1	0.30	1.11	0.51	0.01
Korea, Rep.	178.4	0.34	0.74	0.93	0.01
Philippines	98.7	0.35	1.32	0.37	0.00
Turkey	133.6	0.37	0.62	1.07	0.01
Chile	72.4	0.45	1.63	0.15	0.00
Peru	83.7	0.48	1.66	0.16	0.00
Pakistan	200.5	0.62	0.61	1.34	0.01
Switzerland	158.2	0.65	1.13	0.83	0.03
Singapore	74.2	1.23	1.62	0.94	0.01
United States	66.7	1.74	2.00	1.03	0.05
South Africa	91.0	1.76	2.74	0.35	0.02
Hong Kong	71.6	4.05	3.39	1.95	0.05
Market-based	110.6	0.81	1.40	0.73	0.02

Panel C: Legal system

Country	DTE	SRP	CRP
Argentina	114.7	6.30	1.00
Austria	249.1	6.80	3.00
Belgium	157.6	6.00	2.00
Brazil	148.6	6.30	1.00
Chile	72.4	6.00	2.00
France	149.1	6.50	0.00
Germany	208.6	5.80	3.00
Greece	142.9	6.30	1.00
Indonesia	159.2	5.80	2.00
Italy	238.5	5.80	2.00
Japan	145.0	5.80	2.00
Korea. Rep.	178.4	7.20	3.00
Lebanon	82.4	4.20	4.00
Mexico	116.1	5.80	0.00
Netherlands	139.6	5.80	3.00
Norway	250.0	7.50	2.00
Peru	83.7	6.20	0.00
Philippines	98.7	4.00	1.00
Poland	76.4	6.20	1.00
Portugal	214.3	6.00	1.00
Slovenia	84.2	7.00	3.00
Spain	170.8	7.00	2.00
Switzerland	158.2	5.00	1.00
Turkey	133.6	7.20	2.00
Civil-law	148.8	6.10	1.75
Australia	91.4	6.00	3.00
Canada	121.1	7.80	1.00
Ghana	130.7	5.20	1.00
Hong Kong	71.6		4.00
Ireland	161.8	7.50	1.00
Kenya	65.3	5.80	4.00
Malaysia	85.2	7.80	3.00
New Zealand	107.3	8.20	4.00
Nigeria	102.5	8.20	4.00
Pakistan	200.5	7.00	1.00
Singapore	74.2		3.00
South Africa	91.0	7.00	3.00
Sri Lanka	111.8		2.00
Thailand	148.7	6.50	2.00
United Kingdom	103.1	7.50	4.00
United States	66.7	6.50	1.00
Common-law	108.3	7.00	2.56

Panel A2:
First vs. last quarter Development

Percentiles	DTE	GDP	HDI
Lowest	119.2	1959	0.59
Highest	162.8	40634	0.88

Panel B2:
First vs. last quarter Financial system

Percentiles	DTE	INDEX	M / A	T / C	T / O
Lowest	135.0	-0.98	0.44	0.10	0.05
Highest	115.7	1.48	1.52	0.89	0.63

Panel C2:
Civil-law

Civil-law	DTE	SRP	CRP
French	114.7	6.30	1.00
Other	249.1	6.80	3.00

Panel D:
Religion

Country	DTE	CAT	PRO	ISL
Argentina	114.7	71.0	9.0	2.5
Austria	249.1	73.8	4.9	4.2
Belgium	157.6	50.0	2.5	5.0
Brazil	148.6	64.6	22.2	0.1
Canada	121.1	39.0	20.3	3.2
Chile	72.4	66.7	16.4	0.0
France	149,1	66,0	2,0	8,0
Germany	208,6	29,0	27,0	4,4
Ireland	161,8	78,3	5,0	1,3
Italy	238,5	80,0	1,0	2,0
Mexico	116,1	82,7	5,0	0,0
Netherlands	178,4	7.9	19.7	0.0
Peru	83.7	81.3	12.5	0.0
Philippines	98.7	82.9	10.0	5.0
Poland	76.4	87.2	0.4	0.0
Portugal	214.3	81.0	3.3	0.6
Slovenia	84.2	57.8	0.8	2.4
Spain	170.8	67.8	3.7	4.1
Switzerland	158.2	37.3	24.9	5.1
Australia	91.4	22.6	27.2	2.6
Ghana	130.7	13.1	58.1	17.6
Kenya	65.3	23.4	47.7	11.2
New Zealand	107.3	11.6	33.0	1.1
Norway	250.0	2.8	83.0	2.8
South Africa	91.0	7.1	36.6	1.5
United Kingdom	103.1	9.0	50.0	4.4
United States	66.7	20.8	46.5	0.9
*Christian	137.3	48.7	21.2	3.3
Turkey	159.2	2.9	7.0	87.2
Pakistan	82.4	28.8	1.0	54.0
Indonesia	85.2	3.3	4.0	61.3
Malaysia	102.5	12.6	37.7	50.0
Lebanon	200.5	0.8	0.9	96.4
Nigeria	133.6	0.0	0.0	99.8
Islam	127.2	8.1	8.4	74.8
Singapore	142.9	0.4	0.0	5.3
Sri Lanka	71.6	5.3	6.7	4.2
Greece	145.0	0.3	0.0	0.0
Thailand	139.6	23.7	15.5	4.9
Hong Kong	74.2	7.1	8.0	14.3
Korea. Rep.	111.8	6.1	0.8	9.7
Japan	148.7	0.0	0.0	4.3
Other	119.1	6.1	4,4	6,1

Panel E:
Culture

Country	DTE	IDV	PDI	MAS	UAI
Australia	91.4	90.0	36.0	61.0	51.0
Austria	249.1	55.0	11.0	79.0	70.0
Belgium	157.6	75.0	65.0	54.0	94.0
Canada	121.1	80.0	39.0	52.0	48.0
France	149.1	71.0	68.0	43.0	86.0
Germany	208.6	67.0	35.0	66.0	65.0
Ireland	161,8	70,0	28,0	68,0	35,0
Italy	238,5	76,0	50,0	70,0	75,0
Japan	145,0	46,0	54,0	95,0	92,0
Netherlands	139,6	80,0	38,0	14,0	53,0
New Zealand	107,3	79,0	22,0	58,0	49,0
Norway	250.0	69.0	31.0	8.0	50.0
South Africa	91.0	65.0	49.0	63.0	49.0
Switzerland	158.2	68.0	34.0	70.0	58.0
United Kingdom	103.1	89.0	35.0	66.0	35.0
United States	66.7	91.0	40.0	62.0	46.0
Culture cluster one	152.4	73.2	39.7	58.1	59.8
Argentina	114.7	46.0	49.0	56.0	86.0
Brazil	148.6	38.0	69.0	49.0	76.0
Chile	72.4	23.0	63.0	28.0	86.0
Ghana	130.7	15.0	80.0	40.0	65.0
Greece	142.9	35.0	60.0	57.0	100.0
Hong Kong	71.6	25.0	68.0	57.0	29.0
Indonesia	159.2	14.0	78.0	46.0	48.0
Kenya	65.3	25.0	70.0	60.0	50.0
Korea. Rep.	178.4	18.0	60.0	39.0	85.0
Lebanon	82.4	40.0	75.0	65.0	50.0
Malaysia	85.2	26.0	100.0	50.0	36.0
Mexico	116.1	30.0	81.0	69.0	82.0
Nigeria	102.5	30.0	80.0	60.0	55.0
Pakistan	200.5	14.0	55.0	50.0	70.0
Peru	83.7	16.0	64.0	42.0	87.0
Philippines	98.7	32.0	94.0	64.0	44.0
Poland	76.4	60.0	68.0	64.0	93.0
Portugal	214.3	27.0	63.0	31.0	99.0
Singapore	74.2	20.0	74.0	48.0	8.0
Slovenia	84.2	27.0	71.0	19.0	88.0
Spain	170.8	51.0	57.0	42.0	86.0
Sri Lanka	111.8	35.0	80.0	10.0	45.0
Thailand	148.7	20.0	64.0	34.0	64.0
Turkey	133.6	37.0	66.0	45.0	85.0
Cluster cluster two	119.5	29.3	70.4	46.9	67.4

Panel F:
Firms per country

Country	Firms
Argentina	117
Australia	2866
Austria	169
Belgium	255
Brazil	595
Canada	4465
Chile	262
France	1611
Germany	1538
Ghana	27
Greece	414
Hong Kong	1550
Indonesia	585
Ireland	145
Italy	527
Japan	5009
Kenya	59
Korea. Rep.	2443
Lebanon	9
Malaysia	1294
Mexico	220
Netherlands	302
New Zealand	240
Nigeria	145
Norway	469
Pakistan	374
Peru	176
Philippines	296
Poland	668
Portugal	137
Singapore	894
Slovenia	64
South Africa	873
Spain	307
Sri Lanka	255
Switzerland	410
Thailand	827
Turkey	460
United Kingdom	3637
United States	18563

Panel D2:
Christian

Christian	DTE	CAT	PRO	%Islam
Catholic	147.5	63.4	10.0	2.5
Protestant	113.2	13.8	47.8	5.3

Panel E2:
First vs. last quarter cultural dimensions

Percentiles	DTE IDV	DTE PDI	DTE MAS	DTE UAI
Lowest	118.5	159.0	141.4	105.3
Highest	133.6	104.5	153.9	133.9

Appendix 3 – Correlation matrix

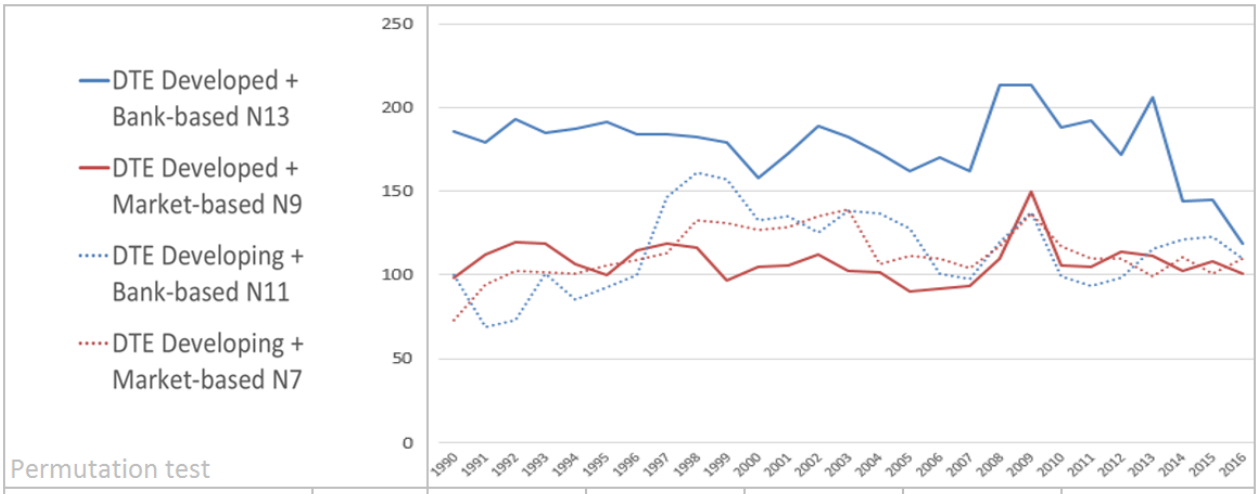
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) logDTE	1.000							
(2) L.logDTE	0.874	1.000						
(3) logGDPpc	0.191	0.179	1.000					
(4) HDI	0.100	0.091	0.942	1.000				
(5) logMCR/GDP	-0.213	-0.171	0.290	0.255	1.000			
(6) logSTR/GDP	0.095	0.113	0.441	0.365	0.614	1.000		
(7) logTR	0.283	0.275	0.336	0.267	0.009	0.795	1.000	
(8) logBA/GDP	0.361	0.353	0.629	0.578	0.449	0.486	0.270	1.000
(9) logcredit	0.139	0.136	0.628	0.565	0.643	0.622	0.294	0.857
(10) shareholder	0.051	0.049	0.091	0.024	0.039	0.069	0.057	0.073
(11) creditor	-0.024	-0.028	0.096	0.078	0.176	0.140	0.042	0.298
(12) Catholic	-0.040	-0.050	0.056	0.125	-0.211	-0.354	-0.286	-0.170
(13) Protestant	-0.278	-0.260	0.202	0.174	0.495	0.430	0.164	0.043
(14) islam	0.010	0.022	-0.435	-0.490	-0.202	-0.055	0.086	-0.252
(15) I	-0.057	-0.053	0.686	0.634	0.354	0.419	0.258	0.366
(16) PD	-0.185	-0.189	-0.639	-0.573	-0.173	-0.292	-0.237	-0.346
(17) MAS	-0.126	-0.111	0.038	-0.024	0.087	0.059	0.009	0.033
(18) UA	0.134	0.109	-0.062	-0.030	-0.452	-0.246	0.036	-0.198
(19) logFDII	-0.046	-0.031	0.107	0.134	0.104	0.005	-0.074	0.062
(20) logNI	0.103	0.109	-0.227	-0.205	-0.081	-0.157	-0.136	0.089
(21) taxi	-0.177	-0.180	0.232	0.165	0.393	0.356	0.149	0.110
(22) loginf	-0.124	-0.157	-0.511	-0.542	-0.324	-0.287	-0.115	-0.510

Variables	(9)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(9) logcredit	1.000							
(10) shareholder	0.179	1.000						
(11) creditor	0.318	0.357	1.000					
(12) Catholic	-0.308	-0.350	-0.461	1.000				
(13) Protestant	0.373	-0.080	0.103	-0.250	1.000			
(14) islam	-0.300	0.192	0.125	-0.435	-0.242	1.000		
(15) I	0.448	0.083	0.142	0.031	0.405	-0.346	1.000	
(16) PD	-0.435	-0.181	-0.225	0.073	-0.375	0.367	-0.673	1.000
(17) MAS	0.007	-0.222	-0.033	0.166	0.170	-0.036	0.284	-0.120
(18) UA	-0.339	-0.207	-0.386	0.356	-0.300	-0.148	-0.421	0.249
(19) logFDII	0.011	-0.008	0.021	0.233	-0.091	-0.057	0.081	-0.056
(20) logNI	0.060	0.138	0.123	-0.221	-0.430	0.297	-0.440	0.350
(21) taxi	0.357	0.287	0.186	-0.303	0.423	0.001	0.489	-0.173
(22) loginf	-0.465	0.087	-0.013	-0.049	-0.056	0.325	-0.311	0.287

Variables	(18)	(19)	(20)	(21)	(22)	(23)
(18) MAS	1.000					
(19) UA	-0.139	1.000				
(20) logFDII	-0.248	-0.124	1.000			
(21) logNI	-0.347	-0.026	-0.010	1.000		
(22) taxi	0.277	-0.548	-0.036	-0.148	1.000	
(23) loginf	-0.062	0.100	-0.072	0.001	-0.090	1.000

Appendix 4 – Permutation with combined country-categorization groups

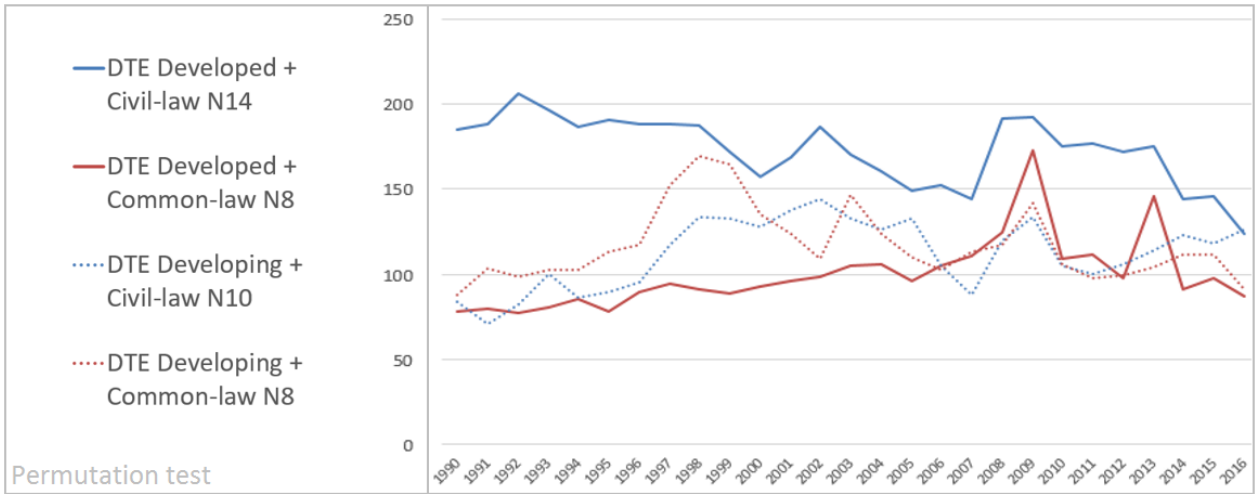
FIGURE 6. PERMUTATION TEST DEVELOPMENT + FINANCIAL SYSTEM



Debt-to-equity	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
DC=0*MB=0 vs. DC=0*MB=1	0.9084*	0.9598*	0.8610	0.8606	0.9260*	0.8960
DC=0*MB=0 vs. DC=1*MB=0	0.9088*	0.9604*	0.8680	0.8554	0.9270*	0.9048*
DC=0*MB=0 vs. DC=1*MB=1	0.9056*	0.9668**	0.8708	0.8592	0.9346*	0.9022*
DC=0*MB=1 vs. DC=1*MB=0	0.3214	0.5324	0.3804	0.2436	0.2824	0.3160
DC=0*MB=1 vs. DC=1*MB=1	0.3266	0.5250	0.3804	0.2424	0.2788	0.3152
DC=1*MB=0 vs. DC=1*MB=1	0.3190	0.0482	0.2472	0.4540	0.2956	0.3024

Notes: N= Number of countries (40 countries in total) and T= 27 years (1990-2016). The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

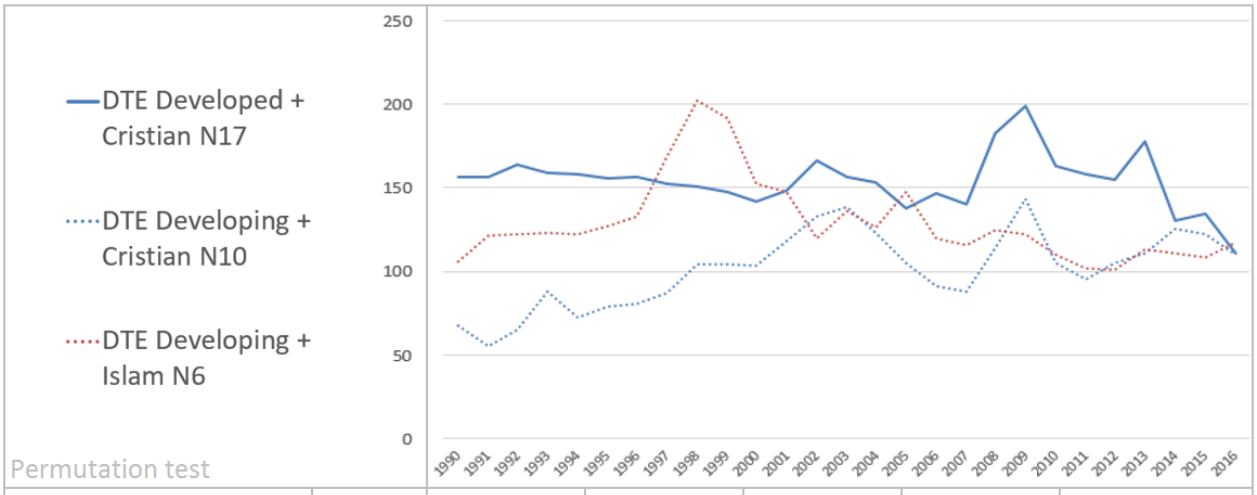
FIGURE 7. PERMUTATION TEST DEVELOPMENT + LEGAL SYSTEM



Debt-to-equity	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
DC=0*CL=0 vs. DC=0*CL=1	0.9338*	0.9918***	0.9292*	0.8692	0.8878	0.8950
DC=0*CL=0 vs. DC=1*CL=0	0.9300*	0.9916***	0.9284*	0.8626	0.8912	0.8892
DC=0*CL=0 vs. DC=1*CL=1	0.9224*	0.9926***	0.9334*	0.8718	0.8808	0.8960
DC=0*CL=1 vs. DC=1*CL=0	0.2498	0.2330	0.1924	0.2192	0.3922	0.3276
DC=0*CL=1 vs. DC=1*CL=1	0.2326	0.2390	0.2126	0.2130	0.3832	0.3338
DC=1*CL=0 vs. DC=1*CL=1	0.2794	0.1548	0.3492	0.4150	0.2714	0.3586

Notes: N= Number of countries (40 countries in total) and T= 27 years (1990-2016). The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

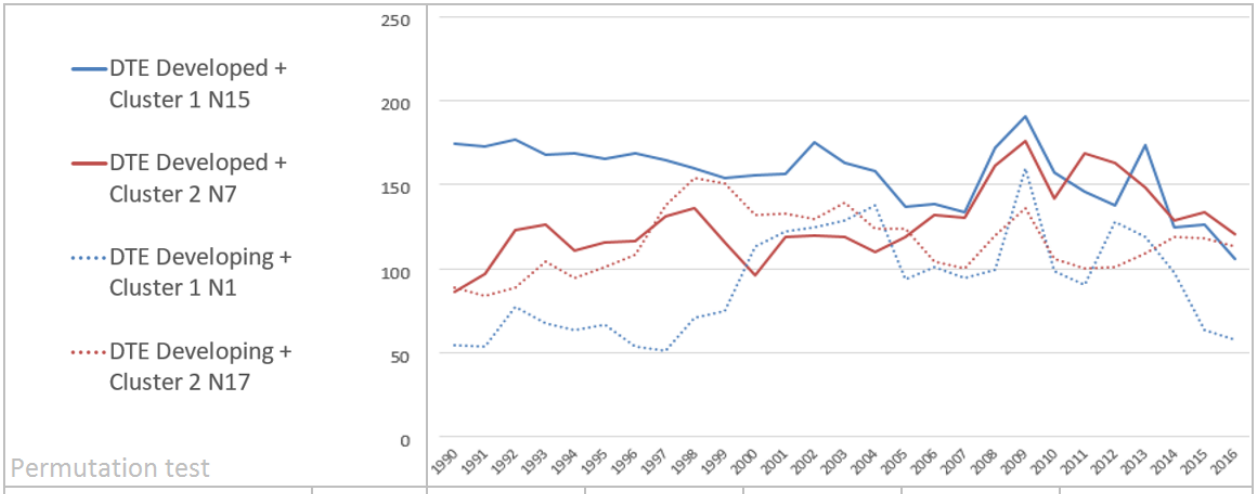
FIGURE 8. PERMUTATION TEST DEVELOPMENT + RELIGION



Debt-to-equity	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
DC=0*IS=0 vs. DC=0*IS=1						
DC=0*IS=0 vs. DC=1*IS=0	0.8398	0.9458*	0.7598	0.7676	0.8716	0.8234
DC=0*IS=0 vs. DC=1*IS=1	0.8264	0.9456*	0.7552	0.7572	0.8778	0.8160
DC=0*IS=1 vs. DC=1*IS=0						
DC=0*IS=1 vs. DC=1*IS=1						
DC=1*IS=0 vs. DC=1*IS=1	0.1960	0.0566*	0.0874*	0.2884	0.2186	0.3274

Notes: N= Number of countries (33 countries in total) and T= 27 years (1990-2016). The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

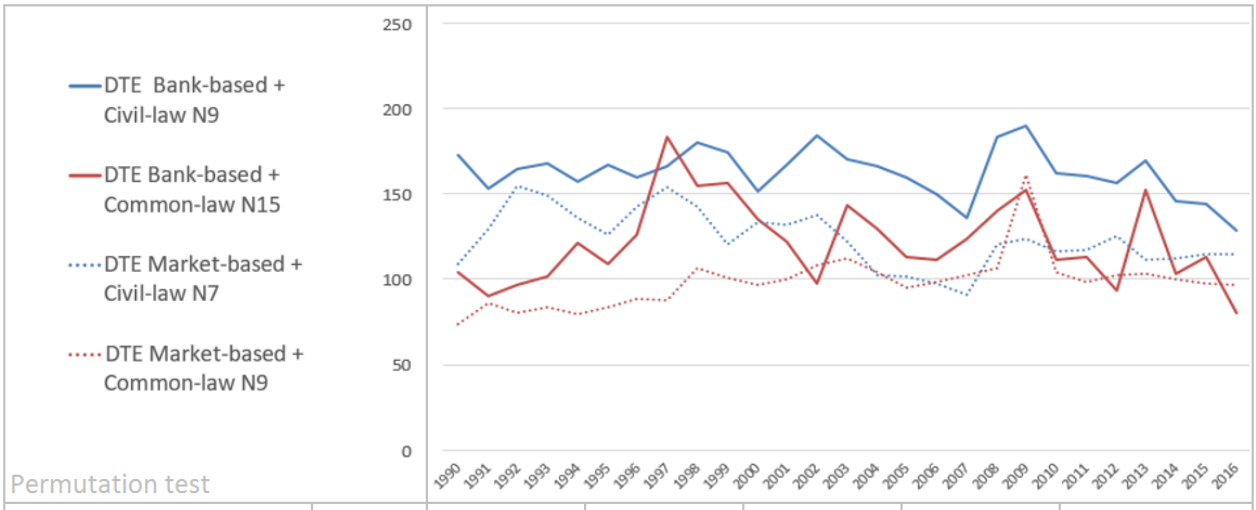
FIGURE 9. PERMUTATION TEST DEVELOPMENT + CULTURE



Debt-to-equity	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
DC=0*CC2=0 vs. DC=0*CC2=1	0.7984	0.9774**	0.8422	0.7712	0.7404	0.6700
DC=0*CC2=0 vs. DC=1*CC2=0						
DC=0*CC2=0 vs. DC=1*CC2=1	0.7992	0.9742**	0.8474	0.7638	0.7420	0.6776
DC=0*CC2=1 vs. DC=1*CC2=0						
DC=0*CC2=1 vs. DC=1*CC2=1	0.4554	0.5108	0.4352	0.5342	0.4772	0.4292
DC=1*CC2=0 vs. DC=1*CC2=1						

Notes: N= Number of countries (33 countries in total) and T= 27 years (1990-2016). Developing countries with Culture cluster one are omitted from the permutation test because of too few observations. The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

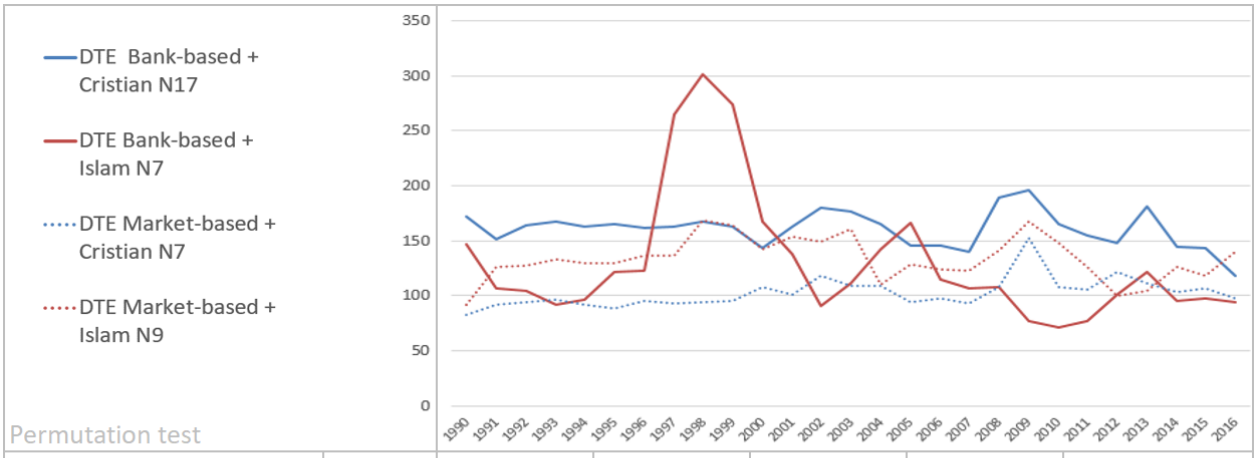
FIGURE 10. PERMUTATION TEST FINANCIAL SYSTEM + LEGAL SYSTEM



Debt-to-equity	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
MB=0*CL=0 vs. MB=0*CL=1	0.8462	0.8770	0.8432	0.8692	0.8526	0.8530
MB=0*CL=0 vs. MB=1*CL=0	0.8552	0.8718	0.8334	0.8602	0.8498	0.8512
MB=0*CL=0 vs. MB=1*CL=1	0.8624	0.8698	0.8284	0.8602	0.8584	0.8478
MB=0*CL=1 vs. MB=1*CL=0	0.4000	0.1278	0.2540	0.3936	0.4392	0.3800
MB=0*CL=1 vs. MB=1*CL=1	0.4054	0.1232	0.2430	0.3794	0.4432	0.3662
MB=1*CL=0 vs. MB=1*CL=1	0.4480	0.6866	0.5758	0.3928	0.3066	0.4386

Notes: N= Number of countries (40 countries in total) and T= 27 years (1990-2016). The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

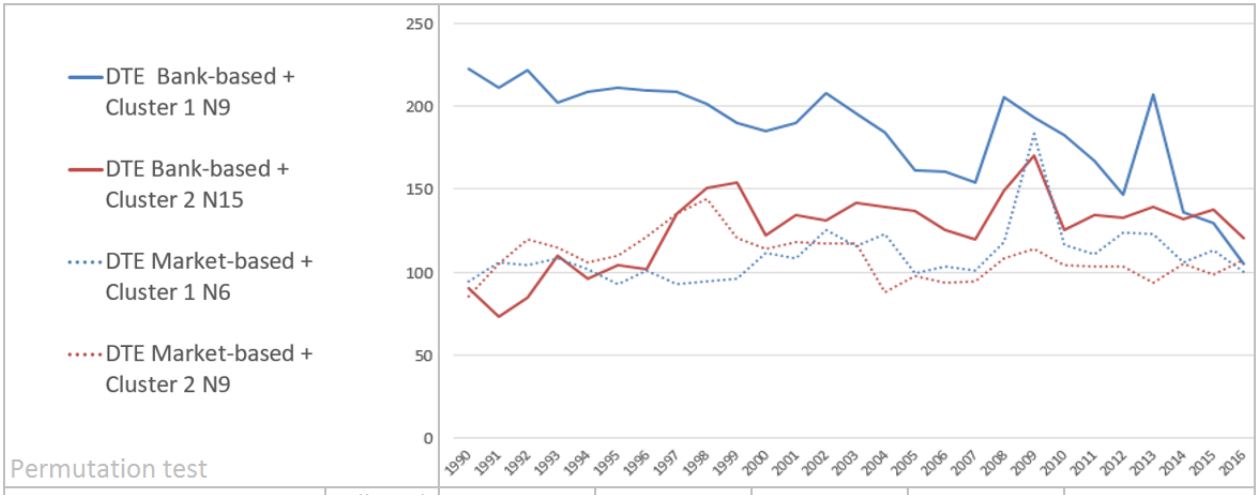
FIGURE 11. PERMUTATION TEST FINANCIAL SYSTEM + RELIGION



Debt-to-equity	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
MB=0*IS=0 vs. MB=0*IS=1	0.8220	0.8002	0.6112	0.8060	0.8480	0.8362
MB=0*IS=0 vs. MB=1*IS=0	0.8084	0.7946	0.6090	0.8020	0.8630	0.8358
MB=0*IS=0 vs. MB=1*IS=1	0.8078	0.7944	0.6212	0.8028	0.8530	0.8380
MB=0*IS=1 vs. MB=1*IS=0	0.4408	0.1646	0.5046	0.5134	0.4120	0.3628
MB=0*IS=1 vs. MB=1*IS=1	0.4326	0.1598	0.4866	0.5096	0.4086	0.3678
MB=1*IS=0 vs. MB=1*IS=1	0.2182	0.3026	0.2132	0.2288	0.2494	0.3116

Notes: N= Number of countries (33 countries in total) and T= 27 years (1990-2016). The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

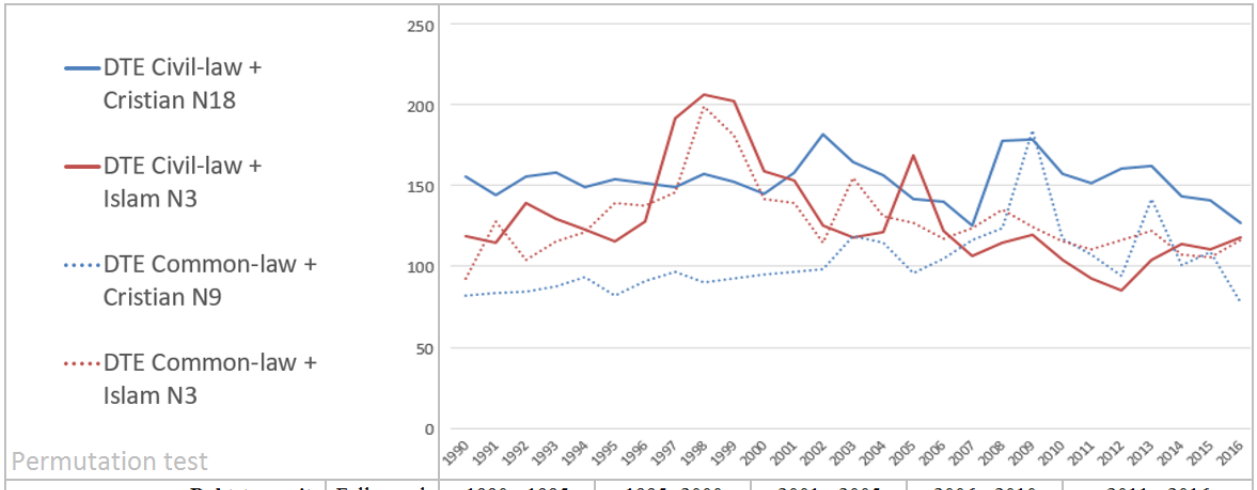
FIGURE 12. PERMUTATION TEST FINANCIAL SYSTEM + CULTURE



Debt-to-equity	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
MB=0*CC2=0 vs. MB=0*CC2=1	0.8864	0.9852**	0.9374*	0.8868	0.8348	0.7650
MB=0*CC2=0 vs. MB=1*CC2=0	0.8916	0.9856**	0.9424*	0.8828	0.8210	0.7472
MB=0*CC2=0 vs. MB=1*CC2=1	0.8966	0.9876**	0.9350*	0.8878	0.8224	0.7625
MB=0*CC2=1 vs. MB=1*CC2=0	0.8980	0.9888**	0.9322*	0.8808	0.8272	0.7520
MB=0*CC2=1 vs. MB=1*CC2=1	0.8158	0.7902	0.6060	0.8042	0.8596	0.8310
MB=1*CC2=0 vs. MB=1*CC2=1	0.4738	0.6436	0.6608	0.4360	0.3500	0.3974

Notes: N= Number of countries (40 countries in total) and T= 27 years (1990-2016). The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

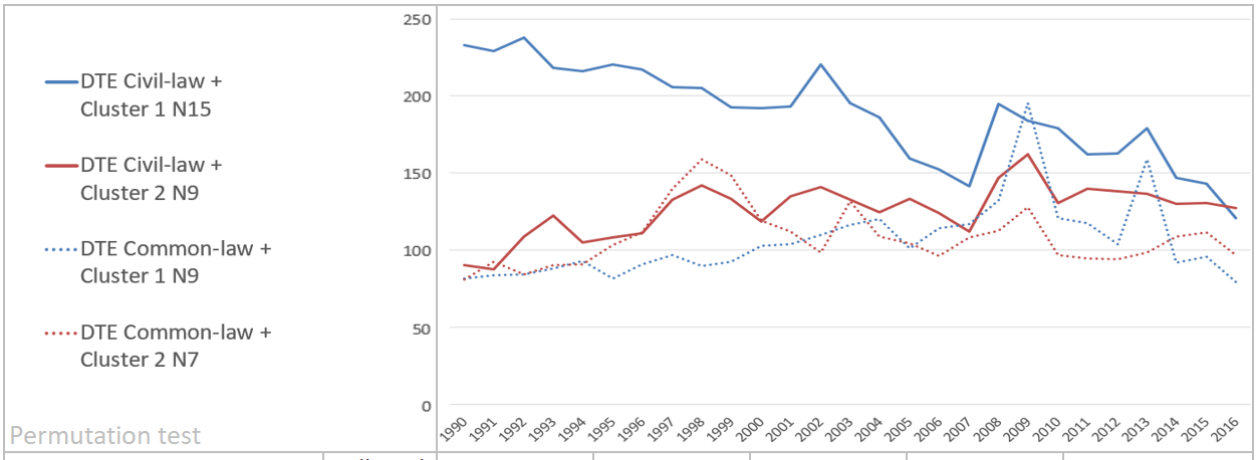
FIGURE 13. PERMUTATION TEST LEGAL SYSTEM + RELIGION



Debt-to-equity	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
CL=0*IS=0 vs. CL=0*IS=1						
CL=0*IS=0 vs. CL=1*IS=0	0.7854	0.8924	0.7220	0.8092	0.7676	0.8176
CL=0*IS=0 vs. CL=1*IS=1						
CL=0*IS=1 vs. CL=1*IS=0						
CL=0*IS=1 vs. CL=1*IS=1						
CL=1*IS=0 vs. CL=1*IS=1						

Notes: N= Number of countries (33 countries in total) and T= 27 years (1990-2016). Combination with Islamic-majority countries are omitted from the permutation test because of too few observations. The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations

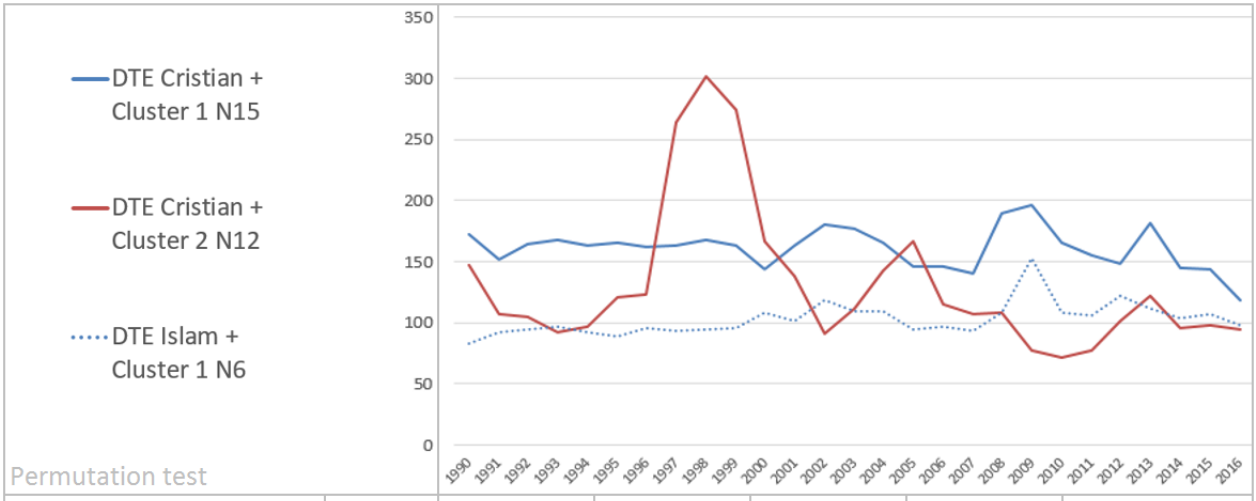
FIGURE 14. PERMUTATION TEST FINANCIAL SYSTEM + CULTURE



Debt-to-equity	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
CL=0*CC2=0 vs. CL=0*CC2=1	0.9044*	0.9948***	0.9446*	0.8986	0.7836	0.7716
CL=0*CC2=0 vs. CL=1*CC2=0	0.9072*	0.9934***	0.9476*	0.8894	0.7814	0.7628
CL=0*CC2=0 vs. CL=1*CC2=1	0.9094*	0.9938***	0.9466*	0.9012*	0.7868	0.7728
CL=0*CC2=1 vs. CL=1*CC2=0	0.3804	0.2040	0.3672	0.4424	0.4948	0.5920
CL=0*CC2=1 vs. CL=1*CC2=1	0.4076	0.1970	0.3636	0.4368	0.4812	0.5970
CL=1*CC2=0 vs. CL=1*CC2=1	0.3054	0.2966	0.2408	0.2986	0.4848	0.3726

Notes: N= Number of countries (40 countries in total) and T= 27 years (1990-2016). The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

FIGURE 15. PERMUTATION TEST RELIGION + CULTURE

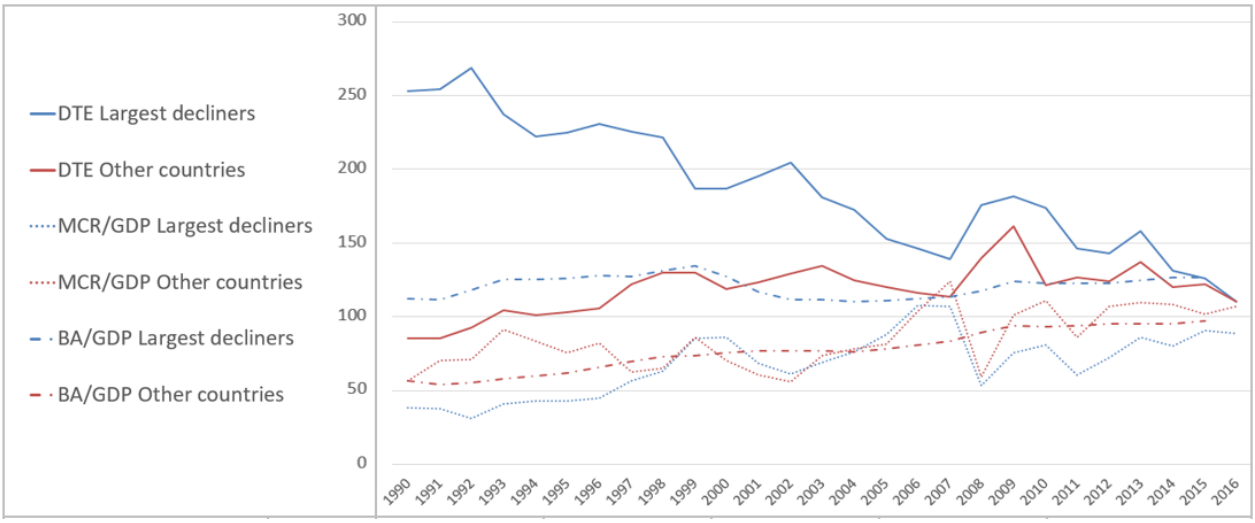


Debt-to-equity	Full sample	1990 - 1995	1995 -2000	2001 - 2005	2006 - 2010	2011 - 2016
IS=0*CC2=0 vs. IS=0*CC2=1	0.5852	0.6136	0.3156	0.5750	0.6746	0.6898
IS=0*CC2=0 vs. IS=1*CC2=0						
IS=0*CC2=0 vs. IS=1*CC2=1	0.7220	0.9030*	0.8252	0.7286	0.6632	0.5576
IS=0*CC2=1 vs. IS=1*CC2=0						
IS=0*CC2=1 vs. IS=1*CC2=1	0.2988	0.0326*	0.1540	0.3602	0.4096	0.4398
IS=1*CC2=0 vs. IS=1*CC2=1						

Notes: N= Number of countries (40 countries in total) and T= 27 years (1990-2016). The *** Significant the at the 1 percent level. ** Significant at the 5 percent level. * Significant at the 10 percent level. Source: Author calculations.

Appendix 5 – Largest decliners vs. other countries in the sample

FIGURE 16. LARGEST DECLINERS VS. OTHER COUNTRIES IN THE SAMPLE



Notes: N= Number of countries (40 countries in total) and T= 27 years (1990-2016). The eight countries with the largest decline in leverage over the years are: Austria, Belgium, France, Germany, Japan, Korea, Rep., Norway and Switzerland.