

The financial impact of cultural diversity on multinational firms

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To my family

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Abstract

This thesis investigates the influence of cultural diversity within U.S. multinational firms on their performance, capital structure, and dividend policy. While existing literature has documented that formal institutions and regulations affect multinational firms, less attention has been paid to the influence of culture. However, culture is important because cultural diversity is an inherent characteristic of multinational firms. During their overseas expansions, multinational firms establish subsidiaries in different countries where cultures differ from one another. Further, according to North (1990) and Williamson (2000), culture affects financial activities either through the daily routines of individuals' behavior or countries' overall value systems. Therefore, cultural diversity can significantly influence corporate strategy, operating efficiency and the financial aspects of multinational firms.

To investigate the effects of cultural diversity, first, we need to understand what culture is. Chapter 2 provides this background information, which includes definitions and characteristics of culture. Further, there are substantial cross-cultural differences in financial activities and outcomes and Chapter 2 looks into how cultural traits and cultural distances cause these differences. Finally, based on theoretical foundations established in existing studies, Chapter 2 develops arguments on how cultural diversity affects the financial aspects of multinational firms.

Chapter 3 constructs a sample of U.S. listed firms over a ten-year period 2004-2013 and an entropy measure of cultural diversity used throughout this thesis. Empirical analyses are carried out starting from Chapter 4, which investigates the impact of cultural diversity on the value of multinational firms. The results in Chapter 4 show that there is a significant and negative relation between cultural diversity and firm value. This negative

relation holds after controlling for the firm-level factors, economic treaties, and macroeconomic risks. The negative valuation effect of cultural diversity becomes stronger when controlling for shared language, shared law, and colonial relations, indicating that the effect of cultural diversity is distinctive and not a proxy for these country-level similarities. Further, the negative relation between cultural diversity and firm value does not disappear after using alternative culture and valuation measures. Finally, the negative effect of cultural diversity on firm value is robust over time and to endogeneity tests, suggesting that the result is not driven by the business cycle and that the relation between cultural diversity and firm value is causal. These results support the idea that global diversification negatively affects firm value (Denis *et al.* 2002). Chapter 4 extends this idea by showing that this valuation effect is associated with the cultural diversity of multinational firms.

Chapter 5 examines the impact of cultural diversity on the capital structure of multinational firms. The results show that cultural diversity is negatively related to book and market leverage ratios after controlling for firm-level determinants, country-level factors, and macroeconomic variables. Further, these results are robust to alternative cultural measures, different periods, and endogeneity. The results provide complementary evidence to multinational capital structure studies, in particular to Desai *et al.* (2008) who show how foreign expansion risk affects the leverage ratios of multinational firms. Therefore, the results suggest that both formal and informal institutional variables are important for determining leverage ratios in a multinational setting. Moreover, Chapter 5 looks into the channels through which cultural diversity reduces leverage ratios and finds that lower leverage ratios associated with higher degrees of cultural diversity are mainly caused by equity issuance rather than debt reduction. These results are in line with Vijn (2006) who finds that firms with parent-subsidiary structures tend to issue equity and Myers (2000) who documents that complex firms are more likely to conduct equity

activities. Chapter 5 demonstrates that cultural diversity is related to firm complexity and therefore is a relevant factor in managerial decision-making on the capital structures of multinational firms.

Chapter 6 investigates the relation between cultural diversity and the dividend policies of U.S. multinational firms. Specifically, this chapter examines the effect of cultural diversity in the context of the outcome and substitute of agency models. The results show that the effect of cultural diversity on dividend ratios is negative and significant, after controlling for the determinants of dividend decisions documented in prior research. The negative effects of cultural diversity are robust to alternative cultural measures, alternative estimation techniques, as well as a range of subsample analyses. Further analyses show that the effect of cultural diversity is not related to factors that may be associated with dividend decisions in international operations. Therefore, Chapter 6 provides evidence supporting the substitute model that shareholders of U.S. multinational firms with higher cultural diversity concern less about agency problems and therefore accept a lower dividend payout ratio.

In conclusion, multinational firms inherently differ from purely domestic firms as their operating environment is more complex. Financial performance, activities, and policies of multinational firms are influenced not only by firm characteristics but also by cultural challenges. However, so far the effect of culture is largely neglected in existing studies. By focusing on cultural diversity and its effects on financial aspects of multinational firms, this thesis fills several important research gaps in the existing literature.

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Attestation of Authorship

I, Fan Zhang, hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Signed: **Fan Zhang**

Date: **September/2017**

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Chapter 1 Introduction

“When in Rome, do as the Romans do.”

-- Aurelius Ambrosius (Saint Ambrose)

This thesis focuses on the impact of cultural diversity of U.S. multinationals on their operations. Why multinational firms? The most evident and also important reason is that multinational firms nowadays play an increasingly influential role in the economic development of global markets. By diversifying their production, marketing, finance, and staffing across international borders, multinational firms not only generate taxable revenue for their home countries, but also facilitate worldwide innovation and productivity (Keller & Yeaple 2009), knowledge transfer (Gupta & Govindarajan 2000), and job creation (Birkinshaw & Hood 1998).

While the main motion of a multinational’s operations is driven by economic factors, its basic functioning is contingent on cross-cultural cooperation and communication (Hofstede 2001). This is because different value systems are inevitably encountered when firms operate overseas. Foreign subsidiaries operate inherently according to local value and customs, even if they adopt multinational policies that are based on the home culture (Hofstede 2001). Furthermore, Hofstede (2001) argues that the effect of value differences can be stronger for U.S. than non-U.S. multinationals. As most non-U.S. multinationals are almost always multicultural, the expatriate managers of non-U.S. multinationals tend to stay in local societies longer to absorb the local culture. In contrast, U.S. multinationals “put the burden of biculturality on the foreign nationals”. The expatriate managers of U.S.

multinationals tend to stay overseas for a short duration and use unified worldwide policies to fulfil their duties (Hofstede 2001).

Existing finance studies on multinational firms mainly stress the effects of geographical diversification, foreign exchange risks (Bartov *et al.* 1996; Allayannis & Weston 2001; Brown 2001), and formal institutions¹ on multinational firms (Henisz 2000; Fauver *et al.* 2003; Desai *et al.* 2006, 2008; Bilir 2014), the impact of cultural diversity remains less known. However, among all of the international environmental factors, culture is the most fundamental because it not only directly governs the daily routines of multinational firm managers through individual values, norms, and preferences, but also can indirectly affect multinational firms through formal institutions such as legal and political frameworks (North 1990; Williamson 2000). This is in particular important for multinational firms with various subsidiaries in different countries. Further, as Hofstede (2001) points out, “.....cultural value plays a role in the interactions of individuals. More importantly, however, is their impact on corporate policies.....” (Hofstede 2001). This argument is in line with Gómez-Mejía and Palich (1997) and Palich and Gomez-Mejia (1999), who suggest that cultural diversity can impact the financial outcome, strategy, activity, policy, and efficiency of multinational firms.

To manifest the significant impact of cultural diversity on multinational firms, this thesis focuses on three issues: firm value, capital structure, and dividend policy. These three aspects are among the most important areas of corporate finance. First, this thesis examines the relation between cultural diversity and firm value. Firm value is the core issue of corporate finance as maximizing shareholder value to align the interests of shareholders and managers is the modern firms’ ultimate goal (Jensen & Meckling 1976).

¹ Formal institutions refer to written regulations, laws, policies, and administrative orders enforced by official authorities. Informal institutions refer to culture. See, for instance, North (1990) and Salimath and Cullen (2010) for detailed explanations.

However, as international operations increase firm complexity during the process of foreign expansion, multinational firms encounter cultural differences. As suggested by Gómez-Mejia and Palich (1997) and Palich and Gomez-Mejia (1999), cultural diversity significantly affects corporate strategies and operating efficiencies and therefore is critical to value creation of multinational firms. This thesis documents that the costs and frictions associated with cultural diversity lead to a valuation deduction. By examining the role of culture in firm value, this thesis provides insights regarding the financial outcomes of global diversification.

Second, this thesis analyses the relation between cultural diversity and capital structure. The determinant of capital structure is another important issue in corporate finance and is closely related to firm value. Masulis (1983) and Myers (1984) argue that when a firm agency problem is severe, debt levels should be increased as it can constrain agency issues and thus increase firm value. However, literature documents that multinational firms, which are argued to have higher agency problems, have lower leverage ratios than purely domestic companies (Lee & Kwok 1988; Park *et al.* 2013). Another strand of study documents that cultural difference significantly affects the way that firms finance their capital needs (Chui *et al.* 2002; Kwok & Tadesse 2006; Zheng *et al.* 2012). These studies suggest that cultural diversity has a significant influence on the capital structures of multinational firms. This thesis connects the aforementioned two strands of literature and shows that the lower leverage ratios of multinational firms are associated with cultural diversity. The findings of this study shed light on research that investigates the capital structure of multinational firms and provide new insights for multinational managers to understand better the underlying factors that lead to effective financing decisions.

Finally, this thesis focuses on the relation between cultural diversity and dividend policy, an important corporate finance topic in parallel to capital structure (Jalilvand &

Harris 1984; Myers 1984). Existing cross-country studies provide evidence that national culture has a significant impact on payout policies (Shao *et al.* 2010; Chen *et al.* 2015). Moreover, prior studies document that the dividend policies of U.S. multinational firms are significantly different from those of purely domestic firms. U.S. multinationals hold the majority of their cash overseas, and thus their dividend policies are impacted by the local environments of their foreign operations (Hines 1996). Building on these studies, this chapter argues that culture is a crucial factor leading to this difference, given that cultural diversity is closely related to both agency costs and information asymmetry, two core arguments in dividend policy theory. By investigating how cultural diversity affects the dividend policy of multinational firms, this thesis makes an important contribution to culture and dividend policy studies.

By examining the aforementioned three aspects, this thesis aims to attain an in-depth understanding of how cultural diversity affects the financial practices of multinational firms. Before embarking on empirical analyses, the next chapter will offer theoretical and empirical bases about the nature of culture and develop arguments on how cultural diversity influences multinational finance.

Chapter 2 Background and Arguments

2.1 Background

This chapter presents a theoretical background for this thesis. As this thesis emphasises the influences of culture, this chapter starts with discussions of the definition of culture and how it evolves within the context of academic research. Thereafter, it connects culture with finance research by reviewing the mechanisms through which culture affects financial activities and outcomes. This chapter then extends discussions to cultural diversity. Finally, this chapter develops theoretical arguments on the mechanism and channels through which cultural diversity can affect financial outcomes, activities and policies of multinational firms.

2.1.1 What is culture?

To understand the financial impact of culture, it is critical to understand what culture is. Culture is a core concept in anthropology and was first used in English scholarly research by British anthropologist Tylor (1871, 1881). According to Tylor (1871), culture “includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society”. Afterwards, in the process of his research on the evolution of society and religion, Tylor (1881) redefined culture as value systems and activities that distinguish people in all human societies. This definition links culture with modern social science and opens the door for academic research on culture. Modern culture research is an important area in sociology. As one of the key founders of modern sociology, Weber (1930, 1968) pioneered research on the impact of cultures on economic systems and activities. More recently, culture has been intensively studied in the discipline of social psychology. For example, Hofstede (1980, 2001) defines culture as “the collective programming of the mind distinguishing the

members of one group or category of people from others”. Similarly, Schwartz (2006) views culture as “the rich complex of meanings, beliefs, practices, symbols, norms, and values prevalent among people in a society. The prevailing value emphases in a society may be the most central feature of culture..... These value emphases express shared conceptions of what is good and desirable in the culture, the cultural ideals”.

The above definitions indicate that culture has two important characteristics. First, culture represents the collective value of a group. According to Hofstede (2001), while culture can be manifested in superficial ways, such as symbols, heroes and rituals, value is the core. However, not all values stand for culture. The mind of each human being is constituted by three levels of values: universal value (shared by all mankind), collective value (shared by a group of people), and individual value (personality). Only the value in the middle level – collective value – belongs to culture. Further, during social evolution, the human population is diversified in three causally unrelated directions: genes, languages and cultures. Among them, only culture represents value.

Second, culture is acquired through learning. According to Hofstede (2001), universal values are entirely inherited, and individual values are partly inherited. Unlike these two levels of values, collective values or cultures are entirely learned after birth from people who have experienced the same learning process. While this learning process is lifelong, it is easier to acquire different cultural knowledge during childhood, when people form the fundamental facts of life. Therefore, in a work environment where people have to deal with different cultures in adulthood, there must be value conflicts. Because no culture is perfect and “cultural strengths imply cultural weaknesses”, promoting intercultural understanding and learning become critical for an organization to establish competitive advantage in today’s business where advances in technology and transportation significantly increase the chances of cultural interactions (Hofstede 2001).

In addition, contemporary research views a nation as a cultural unit. This notion is grounded in the theory of nationalism epitomized by Gellner (1983).² This approach is widely adopted by social psychologist (Hofstede 1980, 2001; Schwartz 2006) as well as finance scholars (Stulz & Williamson 2003; Guiso *et al.* 2006). In line with the existing research, this thesis uses nation as a cultural unit.

2.1.2 How does culture affect finance?

While culture is unobservable, it governs an individual's value system and decision-making process, leading to different actions that can result in huge differences in financial outcomes (North 1990; Boyadgiller *et al.* 2004). Dating back to the early 20th Century, Weber (1930) argued that the development of capitalism was fundamentally influenced by cultural transformations, in particular, the Calvinist Reformation. Lal (1999) agrees with this viewpoint, arguing that the rapid growth of free markets in Western countries was largely shaped by individualistic culture. Landes (2000) claims that differences in economic development are determined by culture. According to Williamson (2000), culture is the base level and corporate finance activities are at the outermost level in the economic architecture of institutions (between these two levels are formal institutions), suggesting that finance is fundamentally influenced by culture.

Recent studies examine the impact of culture on finance by comparing cultural traits and investigating cultural distances. Cultural traits are captured by cultural dimensions that reflect a set of values shared by people within a country. Studies in this area investigate how cross-country differences in financial activities and decisions vary with national cultures. The second aspect, cultural distance, measures how different one culture is from another. Studies in this field examine how cross-cultural financial

² One of the core arguments of nationalism in Gellner (1983) is that there is a process of societal fractionalisation and cultural homogenisation in each country. This cultural homogenisation is the basis for a unified political system, which legitimizes an independent country.

activities and decisions are affected by the degree of cultural differences. The following sections review the literature of these two aspects.

2.1.2.1 Evidence from comparing cultural traits

Recent finance studies have investigated the impact of cultural traits on investment practices, risk-taking activities and corporate policies and strategies. Regarding investment practices, Eun et al. (2015) argue that culture is an important factor affecting cross-country differences in the correlation of stock returns. They find that culturally loose (measuring a society's tolerance for abnormal behavior) and individualistic (measuring an individual's attributes that differentiate his or her behavior from that of others) countries tend to have a lower degree of co-movement among stock prices. Chui et al. (2010) find that individualism has a positive impact on stock volatility, trading volume and momentum profits. Their explanation is that individualism is associated with overconfidence and self-attribution. Therefore, stock markets in countries with higher degrees of individualism tend to generate greater trading volume, return volatility and momentum profits. Further, Guiso *et al.* (2008) find that in countries with higher levels of trust, investors are more likely to participate in stock markets and buy stocks. Pevzner *et al.* (2015) find that investor reactions to corporate earnings announcements are stronger in countries with higher levels of trust.

Concerning risk-taking activities, Li et al. (2013) find that firms located in countries characterized by high degrees of individualism and low degrees of uncertainty avoidance tend to take greater risks. Lievenbrück and Schmid (2014) investigate hedge activities and argue that long-term orientation cultures focus on long-term interest and masculine culture emphasizes assertiveness. Therefore, these two cultures are willing to take on more risks and use fewer hedges. As evidence, they find that firms in countries with higher values of long-term orientation have a lower volume of hedging positions, and firms in countries that emphasize masculinity use fewer derivatives, such as options. The

results suggest that national culture affects a firm's hedging decisions, which are one aspect of risk-management strategy. Further, Frijns et al. (2013) examine mergers and acquisitions (M&As) and argue that a CEO's risk tolerance is critical when determining takeover activities because these activities can affect the CEO's personal wealth. Using uncertainty avoidance to capture CEOs' perception of risk, they find that CEOs from countries with higher degrees of uncertainty avoidance are less likely to conduct both domestic and cross-border takeovers. This result suggests that uncertainty avoidance, as a proxy for risk tolerance, affects M&A outcomes.

With respect to corporate policies and strategies, Ferris et al. (2013) link individualism and long-term orientation with overconfidence as an explanation of cross-border M&As, arguing that overconfidence is positively related to individualism and negatively related to long-term orientation. As evidence, they observe that overconfident CEOs are more likely to serve companies in Christian countries, where individualism is emphasized, and long-term orientation is disregarded. They find that CEOs with higher levels of overconfidence are more likely to conduct cross-border M&As and use more cash than equity to finance M&As. Their results indicate that national culture has close ties to a manager's personal state of mind and affects managerial decisions. Further, Holderness (2014) finds that a higher level of egalitarianism in a country leads to more concentrated ownership of public corporations, suggesting that large blockholders are valuable if a society prefers equality to hierarchy and indicates that culture affects shareholder structures across nations. In addition, culture has also been found to affect CEO compensation structure (Tosi & Greckhamer 2004; Bryan *et al.* 2015; Burns *et al.* 2017).

2.1.2.2 Evidence from investigating cultural distances

Studies on cultural distance mainly focus on investment and capital flows, overseas asset allocation, cross-border M&As and firm value and performance. As for investment

and capital flows, Siegel *et al.* (2011) argue that unfamiliarity increases frictions between two cultures, causing firms to be less likely to conduct financial activities in culturally distant markets. They find that the higher the distance in egalitarianism between two countries, the lower the cross-border investment flows, such as bond and equity issuance and syndicate loans. These results suggest that unfamiliarity associated with cultural distance blocks cross-border capital flows. Mian (2006) argues that cultural distance restrains foreign capital flow into local businesses as it restricts conveying “soft information”³, showing that cultural distance impedes foreign banks from making loans to local firms.

In terms of overseas asset allocation, studies on mutual funds provide abundant evidence that cultural distance is associated with unfamiliarity, causing “home bias” and “foreign bias” when making asset allocation decisions. For instance, Beugelsdijk and Frijns (2010) find that for mutual funds in developed countries, cultural distance is negatively associated with the amount of asset allocation in different foreign markets. Anderson *et al.* (2011) show that cultural distance discourages mutual funds from allocating assets overseas. By further considering debt positions and using the gravity model, Aggarwal *et al.* (2012) confirm the aforementioned effects of cultural distance on foreign asset allocation. Karolyi (2016) offers an overview of this literature and ascertain the statistical explanatory power of cultural distance for “home bias” and “foreign bias”.

Regarding cross-border M&As, Ahern *et al.* (2015) argue the frictions between firms in culturally distant countries not only arise from unfamiliarity but also give rise to additional costs. This is because a larger cultural distance makes it difficult for cross-border M&As to realize synergistic gains as employees are more likely to mistrust,

³ Mian (2006) argues that “soft information” facilitates close relationship lending, endorses borrower’s honesty, and promotes bilateral negotiation. Therefore, it is different from “hard information” such as financial information disclosed in an audited annual report.

misunderstand and mismatch goals. They find that a cultural distance not only lowers the number of cross-border M&As, but also reduces announcement returns. Further, Lim et al. (2015) emphasize the asymmetric influences of cultural distance and find that U.S. bidders pay relatively higher premiums for foreign targets, whereas foreign bidders pay relatively lower premiums for U.S. targets. They explain that U.S. culture is well known in the rest of the world; therefore, foreign bidders can accurately value U.S. firms. In contrast, U.S. firms know less about foreign cultures. Therefore, U.S. firms are more likely to overpay foreign targets in cross-border takeovers. This result implies that the combined effect of unfamiliarity and information asymmetry stemming from cultural distance magnifies the barriers in cross-border M&As.

When considering firm value and performance, however, the results are mixed. Hutzschenreuter and Voll (2008) find that an irregular increase in cultural distance reduces firm profitability, suggesting that costs of cultural distance can outweigh the benefits of internationalization and negatively affect firm performance. In contrast, recent studies provide evidence that cultural distance is positively related to firm value and performance. For instance, Shi and Tang (2015) find that cultural similarity increases the likelihood of alliance formation and decreases combined alliance announcement returns. Nahata *et al.* (2014) show that a higher cultural distance stimulates stricter monitoring and screening. Investments that go through these rigorous processes result in better performance. Therefore, it seems that while cultural distance discourages alliances, it does not prevent firms from achieving higher value and better performance.

2.2 Why does cultural diversity affect multinational firms?

While national culture remains constant for a fairly long period (Hofstede 1980), cultural diversity within multinational firms can change more frequently. This is because multinational firms need to develop financial and management practices for subsidiaries

in accordance with the national culture where the subsidiaries operate, cultural diversity inevitably influences multinational finance (Palich & Gomez-Mejia 1999). This section looks into the underlying mechanisms and channels through which cultural diversity affects multinational financial outcomes, activities and policies. Specifically, this section discusses the following aspects: integration difficulties, firm complexity, information asymmetry, and agency problems.

2.2.1 Integration difficulties

Cultural diversity gives rise to higher integration difficulties because of culture clashes that arise both at the managerial and employees levels. Prior studies have found that managers' values and styles are different across cultures (Bigoness & Blakely 1996; Ralston *et al.* 1997; Lee *et al.* 2000). For example, there is a cross-culture difference in managers' attitudes toward incorporating the social responsibility of host countries into decision-making (Waldman *et al.* 2006; Campbell *et al.* 2012; Ioannou & Serafeim 2012). These differences are critical to multinational firms because employees in different nations have different perceptions of senior leadership (Levy *et al.* 2015). Further, because the value, style, attitude, behavior and effectiveness of leadership cannot be simply transferred to other cultures (Pillai *et al.* 1999), a culture clash could be serious if the top managers are "hard-edged" and uncompromising to local cultures. The consequences of culture clashes at the managerial level could lead to a difficulty in cost-cutting, the resignation of key personnel, and an increase in restructuring costs (Moeller & Schlingemann 2005).

At the employee level, studies document that subsidiary human resource management practices closely follow local cultures that are different from one another (Rosenzweig & Nohria 1994; Fey *et al.* 2009). In this case, expatriate deployment is most likely to create a culture clash as the expatriate employees represent the cultures of home countries (Manev & Stevenson 2001; Brock *et al.* 2008). Recruiting local employees can

be a way to overcome cultural differences, but this may also greatly increase agency costs (Wu *et al.* 2008; Caprar 2011). Moreover, local recruitment needs substantial investments to assist human resource development and configure intellectual capital across subsidiaries in different cultures. Supporting cultural distant subsidiaries in developing countries is particularly costly (Andrews & Chompusri 2001; Uhlenbruck 2004).

The above discussion suggests that cultural diversity may require a significant amount of extra costs for a multinational firm to integrate different cultures, as it can be difficult for the multinational firm to effectively coordinate human resources, knowledge transfer, and marketing campaigns across-cultures (Gómez-Mejia & Palich 1997; Palich & Gomez-Mejia 1999). This can increase costs of capital when the firm operates in a large number of different cultures. The likelihood of inefficient coordination may cause the firm difficult to realize synergies (Ahern *et al.* 2015). These effects can be detrimental to the value of the firm. The integration difficulties also increase future performance uncertainty, which is documented to negatively affect leverage ratios (Desai *et al.* 2008).

2.2.2 Firm complexity

Cultural diversity increases the complexity of organizational environment and the ownership structure of multinational firms. First, Lau and Ngo (2001) and Rosenzweig and Singh (1991) find that multinationals are complex in terms of their organizational structures; Bloom *et al.* (2012) and Williamson (1998) show that in large part this organizational complexity stems from cultural differences across countries where multinational firms operate. As evidence, Buck and Shahrim (2005) use German companies as an example and show that when the culture changes, corporate governance also changes. Griffin *et al.* (2017) conduct cross-country studies and find that national culture (individualism and uncertainty avoidance) captures 90% of the country-level explanations for the variation of corporate governance. The organizational complexity of multinational firms fundamentally influences firm strategies, such as coordination and

control, resource configuration, and overseas expansion patterns (Egelhoff 1982; Ghoshal & Bartlett 1990; Sundaram & Black 1992; Hutzschenreuter *et al.* 2011). The increased organizational complexity can also impede transferring firm-specific knowledge across business units (Naveen 2009). These effects would eventually affect operating efficiencies and financial outcomes.

Second, studies also show that cultural difference matters for ownership decisions. Chang and Taylor (1999) find that U.S. and Japanese multinational firms exert different types of control over subsidiaries, suggesting that national cultures matter for ownership structure decisions. Using foreign multinational entries into the U.S., Hennart and Larimo (1998) and Kogut and Singh (1988) find that the higher the cultural distance, the stronger the tendency that multinational firms assume control of foreign subsidiaries. Similar evidence is documented from foreign entries in China (Tse *et al.* 1997; Pan & Li 2000) and U.S.- and Dutch-based multinationals (Tihanyi *et al.* 2005; Slangen & Hennart 2008). Therefore, when a multinational firm has higher degrees of cultural diversity, its ownership structure is expected to become more complex, which can lead to high agency costs (Ang *et al.* 2000) and costs of debt (Lin *et al.* 2011).

Firm complexity associated with cultural diversity can negatively affect the value and capital structure of multinational firms. As for firm value, firm complexity increases the likelihood of inefficient asset allocation, where culturally similar but poorly performed subsidiaries are more likely to be subsidized (Dellestrand & Kappen 2012). As for capital structure, Myers (2000) documents that firm complexity is the fundamental reason for a firm to issue equity to outside investors. Therefore, *ceteris paribus*, increased equity can lead to lower leverage ratios.

2.2.3 Information asymmetry

Cultural diversity can significantly increase information asymmetry, as different

cultures have different ways of generating, transferring and interpreting information (Sperber & Hirschfeld 2004). First and most obviously, cultural diversity increases communication barriers; thus, increasing information asymmetry. While shared language may be a remedy to a certain extent (Luo & Shenkar 2006), it is insufficient to mitigate completely the increased information asymmetry (Reiche *et al.* 2015). For example, Campbell *et al.* (1988) investigate negotiation processes between the U.K. and the U.S., finding that their ways of negotiation are fundamentally different, although they share a common language. Within multinational firms, communication efficiency is critical because the interactions between individuals are more frequent. According to George *et al.* (1998) and Money (1998), effective communication between individuals depends not only on personalities but also on cultural backgrounds. As a result, communication barriers caused by a higher degree of cultural diversity can discourage knowledge-sharing (Makela *et al.* 2007) and reduce value-creation activities within multinational firms.

More insidiously, cultural diversity would worsen the transparency of multinational firms. Aabo *et al.* (2015) report that the breadth of cultural dispersion is associated with firm opaqueness. In other words, when cultural diversity increase, the opaqueness of a multinational firm also increase. This increased opaqueness worsens the information quality and increases information asymmetry between the firm and its outside shareholders. As another piece of evidence, Huang (2015) finds that the shareholders of U.S. multinationals respond more rapidly to information from subsidiaries in English-speaking countries and more slowly to information from subsidiaries in Asian countries, suggesting that culture plays an important role in investors' capacity to process information. The low transparency of multinational firms can lead to serious financial consequences, such as suboptimal investment decisions (Shroff *et al.* 2014), lower credit ratings (Tang 2009) and higher financing costs (Sufi 2007).

Increased information asymmetry associated with higher cultural diversity can have

a significant impact on the value, capital structure, and dividend policy of multinational firms. In terms of firm value, information asymmetry may increase costs of capital as investors require a higher return to compensate for their informational disadvantage, and reduce firm value (Krishnaswami & Subramaniam 1999; Shroff *et al.* 2014). In terms of capital structure, information asymmetry is the core factor of pecking order theory, which suggests due to the different degree of information asymmetry, internal capital should be first considered, followed by external debt, and lastly external equity (Bharath *et al.* 2009).

2.2.4 Agency problems

Cultural diversity can aggravate agency problems at both subsidiary and parent levels. Increased agency costs at the subsidiary level are primarily because cultural diversity provides subsidiary managers with the opportunity to build their own empire (Roth & O'Donnell 1996). Wang *et al.* (2014) suggest that the higher the cultural distance, the greater the subsidiary autonomy delegation. In such a case, subsidiaries' managers may have more of a chance to build their own social work in host markets and acquire local resources that are out of headquarters' control (Venaik *et al.* 2005; Hada *et al.* 2013; Smale *et al.* 2015).

Even if subsidiary managers act in the best interests of multinational firms, CEOs and the shareholders of multinational firms may still incur extra costs to understand local practices due to cultural differences. This would result in increased monitoring costs because local subsidiary managers from different cultures may have different ways of problem solving and behaviours responding to the strategic orders from headquarters (Ling *et al.* 2005). As evidence, Gong (2003) studies Japanese multinational firms where expatriate staffing is common, and expatriate employees highly align with the interests of parent firms, finding that agency costs are still higher when cultural distances are greater. One possible solution to reduce monitoring costs arising from cultural diversity is to encourage managers to learn local cultures. However, this learning effect does not come

free; it may require further costs in terms of both time and money (Shin *et al.* 2007; Slangen & Beugelsdijk 2010; Casillas & Moreno-Menéndez 2014). At the parent level, cultural diversity increases agency costs mainly due to the increased firm complexity and information asymmetry, as discussed in the previous sections. These issues are closely related to the costs of capital and to a firm's financial decisions (Bolton & Freixas 2000; Cohen & Lou 2012).

Greater agency problems are associated with higher cultural diversity and can significantly influence the value, capital structure and dividend policy of multinational firms. In terms of firm value, when agency problems are severe, firm-monitoring costs are high and firm value can be reduced (Roth & O'Donnell 1996; Gong 2003; Harford *et al.* 2017). In terms of capital structure, agency problems are associated with trade-off theory, which suggests that a higher debt level should be applied when there is a greater agency problem (Jensen 1986; Leland 1998). In terms of dividend policy, agency problems are associated with the cash flow argument, which suggests that there would be a low dividend payout ratio when agency problems are higher because managers can manipulate cash flow for empire-building purposes (Dewenter & Warther 1998; La Porta *et al.* 2000).

2.3 Conclusion

In Chapter 2, we review definitions of culture and discuss influences of culture on finance. In particular, we argue that cultural diversity affects financial outcomes, activities, and policies through four channels: integration difficulties, firm complexity, information asymmetry, and agency problems. With respect to the analyses of this thesis, through these channels, cultural diversity is expected to have a significant impact on firm value, capital structure, and dividend policy of multinational firms.

In short, the existing literature offers abundant evidence that national cultural traits

and cultural distance significantly affect financial outcomes, practices, and activities. Studies also suggest that cultural diversity is an important issue for multinational firms as cultural interactions and potential conflicts appear frequently and have direct economic consequences in practice. However, so far, how cultural diversity within a multinational firm influences its financial activities and value has received less attention in the culture and finance research. This thesis aims to fill this important gap and offers a new viewing angle for studying multinational firms, namely by constructing a measure of cultural diversity at the firm level and its impact on value, capital structure, and dividend policy of the firm. The next chapter discusses the construction of cultural diversity, as a starting point for empirical analysis.

Chapter 3

Methodology and Data

3.1 Introduction

This chapter explains the approach that this thesis uses to measure cultural diversity. Given that cultural diversity increases coordination problems, firm complexity, information asymmetry, and agency problems, these issues in turn affect financial performance and activities of multinational firms as discussed in the previous chapter, it is important to provide empirical evidence to verify these impacts. To conduct the empirical tests, it is necessary to construct a measure of cultural diversity and the sample.

3.2 Capturing national culture

This section firstly reviews commonly adopted cultural measures in the existing literature. Then it discusses the measures of culture applied in this thesis and rationales for the uses of these measures.

3.2.1 Measures of culture in the literature

To measure cultural diversity, the first step is to capture the dominant culture of a country. As mentioned in Section 2.1.2, more recent finance studies capture different aspects of the dominant culture of a country through various dimensions.⁴ Each dimension is evaluated by numerical scores according to the degree of country differences

⁴ Early culture-finance studies focus on non-numeric culture proxies, including language, religion, and geographical area. For example, Grinblatt and Keloharju (2001) report that investors are willing to hold the shares of Finnish firms communicating with investors in a native tongue, that are geographically close and that have CEOs with the same cultural background as investors. Mian (2006) distinguishes cultures as Asian and non-Asian and finds that non-Asian multinational banks make few loans to Pakistani local firms. Stulz and Williamson (2003) focus on religion and show that, in general, Catholic countries protect the rights of creditors less effectively than Protestant countries.

in that cultural dimension. Certain sets of cultural dimensions compose a cultural framework. Three cultural frameworks are commonly cited in the finance literature. They are Hofstede's (1980, 2001, 2011),⁵ GLOBE's (House *et al.* 2004),⁶ and Schwartz's (1992, 1994, 1999, 2004, 2006)⁷ cultural frameworks. Among them, the Hofstede's (1980, 2001, 2011) framework seems to be the most influential culture measurement system so far.

A cultural framework can measure culture more directly than cultural proxies, such as language, religion and geographical proximity since it captures an amalgamation of the values, views, practices and social beliefs of a country (Hofstede & Hofstede 2005; Hofstede *et al.* 2010). Further, since there are differences in cultures among countries, a national culture can only be systematically reflected when considering a set of indicators that represent different aspects of the main characters of a country and that differentiate

⁵ Hofstede's (1980, 2001, 2011) cultural measurement system consists of six dimensions: power distance (PDI), individualism (IDV), uncertainty avoidance (UAI), masculinity (MAS), long-run orientation (LTO) and indulgence (IND). PDI measures the degree to which people in a society are willing to accept power-based inequalities. IDV measures the degree to which people in a society focus on him or herself rather than a group. UAI indicates the degree to which people in a society tolerate unstructured or unknown situations. MAS refers to the degree to which people in a society focus on men's values versus women's values, with the former examples including competitiveness and ambition, and the latter examples including modesty and caring. LTO reflects the degree to which people in a society foster of virtue toward the future, rather than the past and present. IND embodies the degree to which people in a society place more value on enjoying life than on self-control (Hofstede *et al.* 2010).

⁶ The GLOBE project (House *et al.* 2004) is based on and extends Hofstede's cultural dimensions to nine: power distance, uncertainty avoidance, institutional collectivism, in-group collectivism, assertiveness, gender egalitarianism, future orientation, humane orientation and performance orientation. As can be seen, the GLOBE project remains the power distance and uncertainty avoidance dimensions in Hofstede. The individualism-collectivism dimension in Hofstede is divided into institutional collectivism and in-group collectivism in GLOBE. Masculinity-femininity in Hofstede is split into assertiveness and gender egalitarianism in GLOBE. Long-term orientation in Hofstede is re-labelled as future orientation in GLOBE. In addition, humane orientation and performance orientation as added in GLOBE. The GLOBE project assigns scores in terms of cultural value and practice to each of these dimensions, arguing that individuals in a culture think "the way things should be" is not necessarily the same as "the way things are". It is worth noting that while the concepts are similar, the intrinsic values of the same label may be different between Hofstede's and GLOBE's dimensions as they use different survey and methodology to construct these dimensions (Hofstede 2006).

⁷ Schwartz's cultural framework identifies seven cultural dimensions: egalitarianism vs. hierarchy, harmony vs. mastery, and embeddedness vs. intellectual autonomy and affective autonomy. Egalitarianism emphasises social justice and equality, whereas hierarchy stresses authority and obedience. Harmony emphasises understanding and appreciating the world as it is, while mastery stresses an ambition to change the world. embeddedness emphasises participating in the collectivity. In contrast, intellectual autonomy encourages individuals to pursue their own ideas, and affective autonomy stresses pleasure and exciting life experiences.

one country from another country (House *et al.* 2014). For example, Shenkar (2001) argues that when a study includes East-Asian countries, it can be unjustified if the sample of the study does not include long term orientation, a traditional value difference between Eastern and Western countries. Moreover, different aspects of national cultural characteristics cannot be mutually exclusive and isolated from one another; therefore, an aggregated measure that consists of different cultural aspects can more accurately reflect the common conditions and social characteristics of a country (House *et al.* 2014).

Apart from the cultural frameworks, it is also common that recent financial and economic studies use dimensions derived from other surveys that explore the values and beliefs of people in different countries to capture a particular aspect of the cultural traits of society. Such surveys include the World Values Survey, the General Social Survey, the European Value Survey, the Eurobarometer Survey, the annual Dutch National Bank (DNB) Household Survey, and the Italian bank customer survey. In addition, some cultural dimensions developed in particular studies have also introduced specific cultural proxies to investigate financial activities and outcomes.⁸

3.2.2 Measures of culture in this thesis

The main measure of culture throughout this thesis is based on the Hofstede's cultural framework. The Hofstede's framework has been applied by studies investigating cultural diversity of multinational firms, such as Gómez-Mejia and Palich (1997) and Hutzschenreuter *et al.* (2011). Hofstede's framework has also been widely applied to studies in financial research, such as venture capital (Nahata *et al.* 2014), board of directors (Frijns *et al.* 2016), information from foreign operations (Huang 2015) and foreign asset allocation (Beugelsdijk & Frijns 2010; Karolyi 2016).

⁸ For example, Gelfand *et al.* (2011) assign scores to 33 countries in terms of tightness and looseness, arguing that individuals in tight cultures tend to have more homogeneous behaviours, whereas people in loose cultures have a high tolerance for deviant behaviours. This measure is adopted by Eun *et al.* (2015)

To ensure robustness, cultural diversity is also estimated based on GLOBE's (2004) cultural framework and three single dimensions – egalitarianism, individualism and trust. Although there may be a conceptual similarity in some dimensions between the GLOBE and Hofstede cultural measures, the GLOBE project uses a different method to construct the measures and captures more aspects than the Hofstede dimensions. Therefore, the GLOBE framework is commonly used as an important alternative cultural measure to the Hofstede dimensions in prior studies, such as Frijns *et al.* (2016), Hutzschenreuter *et al.* (2011) and Karolyi (2016).

Further, while Hofstede's and GLOBE's frameworks are commonly used in culture and finance studies and, as discussed in Section 3.2.1, they thoroughly reflect different aspects of a country's culture, one concern may arise from that it is hard to interpret what cultural traits exactly these measures capture as they are composite measures. Specifically, one may be concerned that the composite measure of culture, such as Hofstede's and GLOBE's framework, is that not all aspects of cultural difference are equally important (Shenkar 2001) and, in some cases, single culture dimensions can more clearly capture national cultural traits (Dow & Karunaratna 2006). To address these concerns, this thesis also estimates cultural diversity using single cultural dimensions as alternatives. In particular, the Schwartz's egalitarianism scores (in the year 2005 release of cultural values dataset) (Siegel *et al.* 2011), and the World Value Survey (WVS) individualism⁹ and trust¹⁰ are applied. According to Ahern *et al.* (2015), these three cultural dimensions

⁹ Following Ahern *et al.* (2015), we measure individualism by using the following question from the WVS: "*Incomes should be made more equal*" versus "*We need larger income differences as incentives for individual effort*". We normalize the average answer to the questions bounded between zero and one for the countries in the sample.

¹⁰ Following Guiso *et al.* (2003), we use the following WVS question to measure trust: "*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*". We normalize the average answer to the questions bounded between zero and one for the countries in the sample.

significantly affect financial decisions.¹¹

3.3 Measuring cultural diversity

This thesis employs an entropy measure of cultural diversity. Entropy has become a well-accepted measure of corporate diversity.¹² Using the entropy measure of cultural diversity has several advantages. First, the entropy measure can appropriately capture firm complexity (Palepu 1985). This is important to our study because cultural diversity increases a firm's complexity in the information transfer, organizational control system, ownership structure, and in human resource programs (Gómez-Mejia & Palich 1997; Palich & Gomez-Mejia 1999). Second, Jacquemin and Berry (1979) compare the entropy measure with the Herfindahl index and demonstrate that while the Herfindahl index has an edge as a measure of corporate concentration, the entropy measure has a substantial advantage to measure corporate diversification. Finally, entropy is recommended by Nijkamp and Poot (2015) as an effective measure of cultural diversity. Following existing global diversification studies, such as Errunza and Senbet (1984) and Hitt *et al.* (2006), we construct an entropy measure of cultural diversity as follows:

$$\text{Cultural diversity}_{it} = \sum_{j=1}^J \text{Distance}_{us,j} \cdot N_{ijt} \ln (1/N_{ijt}) \quad (3A)$$

where N_{ijt} is the proportion of the number of firm i 's subsidiaries in country j to the

¹¹ The main arguments are as follows. First, the degree of egalitarianism in a country is closely tied to the historical progress of the country and can reflect the large part of the culture of the country (Siegel *et al.* 2011). Within multinational firms, differences in egalitarianism can be the cause of conflicts and misunderstandings. For instance, employees in low egalitarian cultures tend to follow instructions of superiors, while employees in high egalitarian cultures are more likely to express their own thoughts (Brett & Okumura 1998). Second, it has been documented that different cultural backgrounds in individualism among employees is one of the main causes of conflicts in a firm, as individualistic culture addresses self-interest, whereas collectivist culture emphasises making personal sacrifices for the benefits of a group (Ahern *et al.* 2015). Third, the trust level of a society is shaped by the dominant religion and civilization of a society (Guiso *et al.* 2006). In particular, trust is important to the fulfilment of financial transactions; therefore, it has a significant impact on financial and economic outcomes.

¹² Jacquemin and Berry (1979) is the milestone paper that introduces entropy into corporate diversification studies. Thereafter, an increasing number of finance studies have adopted entropy to evaluate business and geographical diversity (Jacquemin & Berry 1979; Errunza & Senbet 1984; Palepu 1985; Hitt *et al.* 1997; Villalonga 2004; Hitt *et al.* 2006; Hund *et al.* 2010; CustÓDio 2014).

total number of firm i 's subsidiaries at the end of calendar year t . $Distance_{US,j}$ is the cultural distance between the U.S., the home country of firm i , and country j where the subsidiary is located. To evaluate cultural distance, we assign cultural scores to each subsidiary according to its host country and use a Euclidean version of Kogut and Singh's (1988) formula to calculate the cultural distance between a parent firm and each of its subsidiaries. This approach is commonly used in the finance literature, such as Beugelsdijk and Frijns (2010), Huang (2015) and Karolyi (2016). Specifically,

$$Distance_{US,j} = \sqrt{\sum_{k=1}^K \frac{(I_{k,j} - I_{k,US})^2}{V_k}} \quad (3B)$$

where $Distance_{US,j}$ is cultural distance between the United States and host country j . $I_{k,j}$ is the score of the k th cultural dimension of the foreign country j . $I_{k,US}$ is the score of the k th cultural dimension of the United States. V_k is the in-sample variance of the k th cultural dimension. The Euclidean distance as shown in Equation (3B) is particularly suitable as it is a measurement of distance in a multi-dimensional space. Since the distribution of each dimension of cultural score is different from another, we introduce V_k to standardize the Euclidean cultural distance.

3.4 Sample selection

To empirically measure cultural diversity of multinational firms, this thesis focuses on the U.S. listed firms on the three main stock exchanges: NYSE, NASDAQ, and Amex from 2004 to 2013. Data are obtained from Orbis maintained by Bureau van Dijk. Orbis offers subsidiary-level information on the nation where each subsidiary is incorporated. This information enables us to measure the cultural diversity of a firm effectively. We exclude firms that have no subsidiaries and select firms with an ultimate controlling interest (at least 50.01% ownership) over subsidiaries to ensure that the multinational firms in our sample actively manage their foreign operations, rather than passively

holding foreign financial assets. To further ensure this point, we exclude financial and real estate firms (SIC codes 6000–6799). As for data at the subsidiary level, one concern could be that financial subsidiaries are likely to be special purpose vehicles (SPV) whose main objective is risk management to prevent parent firms from loan default or bankruptcy and thus is irrelevant to firm operational activities. To alleviate this concern, we include only industrial subsidiaries.¹³

The final sample contains 3,615 parent firms with 193,747 subsidiaries operating in 190 countries. This provides us with 17,957 parent-level firm-year observations. Table 3-1 presents the firm-level sample distribution. Throughout the whole sample period, most of the firms have one or two foreign subsidiaries (Panel A) and operate in one or two foreign countries (Panel B). Further, both panels A and B show that over the sample period, there are increases in the number of firms that own more than ten foreign subsidiaries and in more than ten countries. Panel C shows that the percentages of firms that have foreign operations are fairly stable over the sample period.

In an unreported subsidiary distribution, we observe that half of the sample subsidiaries of U.S. firms are established overseas. As for particular foreign countries, the most popular foreign destination in terms of the number of subsidiaries is the U.K. The second place was Germany in 2004, but it has been taken over by Canada since 2005. It is worth noting that China only hosted 1.16% of U.S. subsidiaries in 2004; however, the figure increased to 3.06% in 2013, which makes China the third largest foreign destination for U.S. foreign operations. Similar patterns are observed from Hong Kong, India,

¹³ Orbis classifies subsidiaries into nine types: Bank; Financial company; Foundation/research institute; Industrial company; Insurance company; Mutual and pension fund/nominee/trust/trustee; Private equity firms; Venture capital, and Public, state, government institutions. Among the subsidiaries that Orbis classifies as the industrial company, we look into the names of these subsidiaries, finding that several subsidiaries contain words such as “holding”, “investment”, “fund”, “finance” and “trust” in their titles and remove these subsidiaries.

Table 3-1: Sample distribution of parent firms, 2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Obser.	%Total
Panel A: By number of subsidiaries												
0	58	99	187	208	215	204	165	177	204	201	1,718	9.57%
1	262	330	454	453	404	403	345	340	331	347	3,669	20.43%
2	175	198	292	275	255	216	208	207	209	203	2,238	12.46%
3	111	134	152	164	163	163	151	137	145	117	1,437	8.00%
4	85	95	123	115	100	104	97	98	95	112	1,024	5.70%
5	77	95	112	87	77	82	85	76	100	94	885	4.93%
6	64	64	57	51	65	81	49	58	86	77	652	3.63%
7	40	30	48	57	65	65	51	57	64	57	534	2.97%
8	31	38	43	50	58	53	59	41	53	43	469	2.61%
9	26	36	32	41	32	39	37	31	42	42	358	1.99%
10	38	19	25	26	35	41	46	34	37	43	344	1.92%
>10	304	383	323	406	467	487	487	532	611	629	4,629	25.78%
>10%	23.92%	25.18%	17.48%	21.00%	24.12%	25.13%	27.36%	29.75%	30.91%	32.01%		
Panel B: By number of nations												
0	58	99	187	208	215	204	165	177	204	201	1,718	9.57%
1	333	424	597	591	526	507	424	426	419	430	4,677	26.05%
2	198	229	300	284	265	253	261	262	265	246	2,543	14.16%
3	132	150	172	159	169	171	142	137	151	142	1,525	8.49%
4	95	110	124	116	104	104	94	110	115	123	1,095	6.10%
5	77	82	84	73	77	88	75	67	88	77	788	4.39%
6	62	45	52	64	75	73	70	67	77	75	660	3.68%
7	47	53	35	48	57	58	54	43	64	59	518	2.88%
8	24	35	32	46	39	40	41	42	53	45	397	2.21%
9	26	33	27	25	29	36	48	40	34	47	345	1.92%
10	21	25	14	24	29	35	24	35	40	32	283	1.58%
>10	198	236	224	295	351	365	382	402	467	488	3,408	18.98%
>10%	15.58%	15.52%	12.12%	15.26%	18.13%	18.87%	21.46%	22.23%	23.62%	24.83%		
Panel C: Whole sample												
Foreign%	95.44%	93.49%	89.88%	89.24%	88.89%	89.47%	90.73%	90.10%	89.68%	89.77%		90.43%
Total	1,271	1,521	1,848	1,933	1,936	1,938	1,780	1,788	1,977	1,965	17,957	100%

This table reports the number of sample firms that have different number of subsidiaries and that operate in different nations during the 2004-2013 period. “% Foreign” shows the percentage of sample firms given number of foreign subsidiaries in Panel A and the percentage of sample firms operating in a given number of foreign countries in Panel B, respectively. “Obser.” Column reports the number of firm-year observations. “% Total” Column reports the percentage of a given number of foreign subsidiaries or foreign nations over the total number of observations.

Singapore, Malaysia, and South Korea. This provides preliminary evidence that U.S. firms have increased their foreign operations to more culturally distant markets, especially Asian countries.

Summary statistics are shown in Table 3-2. The first column gives cultural diversity based on Hofstede's cultural framework; it shows that the mean (median) of cultural diversity is 2.49 (1.54) with a maximum value of 9.53. It is noteworthy that cultural diversity in 2013 is significantly higher than that in 2004. This result responds to the trend of sample distribution shown in Table 3-1, suggesting there is an increase in cultural diversity over the sample period.

As for alternative measures, we re-estimate cultural distance using the Euclidean version of Kogut and Singh's (1988) formula as defined in Equation (3B) and then incorporate the values of cultural distance into Equation (3A) to obtain the values of cultural diversity. The second to last column Table 3-2 report summary statistics for cultural diversity based on the GLOBE framework, egalitarianism, individualism, and trust. Three out of four measures show that cultural diversity in 2013 is significantly higher than that in 2004; the only exception is cultural diversity measured by egalitarianism. Overall, these results are in line with cultural diversity measured by the Hofstede's framework, indicating that cultural diversity increases over the sample period.

Table 3-2: Summary statistics for cultural diversity

	CD_Hofstede	CD_GLOBE	CD_Egali.	CD_Indiv.	CD_Trust
Panel A: Summary statistics					
Mean	2.49	2.40	0.74	0.55	0.68
2004	2.46	2.41	0.83	0.58	0.73
2005	2.31	2.25	0.76	0.53	0.67
2006	1.65	1.63	0.54	0.38	0.47
2007	2.14	2.08	0.65	0.48	0.59
2008	2.38	2.30	0.71	0.52	0.63
2009	2.52	2.42	0.74	0.55	0.66
2010	2.73	2.60	0.78	0.60	0.72
2011	2.77	2.64	0.79	0.60	0.74
2012	2.89	2.76	0.82	0.62	0.78
2013	2.95	2.82	0.83	0.63	0.80
Difference (2013-2004)	0.49*** (4.99)	0.41*** (4.45)	0.00 (0.07)	0.05** (2.36)	0.07** (2.47)
Median	1.54	1.52	0.51	0.33	0.43
Std. Dev	2.57	2.43	0.71	0.57	0.73
Min	0.00	0.00	0.00	0.00	0.00
Max	9.53	8.84	2.49	2.13	2.83
Observations	16,658	16,658	16,658	16,658	16,658

This table reports the summary statistics of and correlations between cultural diversity measures. Cultural diversity is calculated as an entropy measure: $Cultural\ Diversity_i = \sum_{j=1}^J Distance_{US,j} * N_j \ln(1/N_j)$, where N_j is the proportion of firm i 's subsidiaries incorporated in country j to the total number of firm i 's subsidiaries, $Distance_{US,j}$ is cultural distance between the United States and country j. $Distance_{US,j}$ is computed using a Euclidean version of the Kogut and Singh (1988)'s formula and is based on the following cultural measures. (1) CD_Hofstede is cultural diversity based on a composite index of Hofstede's six cultural dimensions include: power distance index (PDI), individualism index (IDV), masculinity index (MAS), uncertainty avoidance index (UAI), long-term orientation (LTO), and Indulgence (IND). (2) CD_GLOBE is cultural diversity based on a composite index of GLOBE's (House *et al.* 2004) nine cultural dimensions. (3) CD_Egali. is cultural diversity based on Schwartz's (2005) egalitarianism scores, as reported in Siegel *et al.* (2011). (4) CD_Indiv. is cultural diversity based on the average of the World Value Survey question: "Incomes should be more equal or we need larger income differences as incentives for individual effort". The scores are normalized between zero and one. (5) CD_Trust is cultural diversity based on the average answer of the World Value Survey question: "Generally speaking, would you say that (i) Most people can be trusted (ii) Need to be very careful". The scores are normalized between zero and one. The significance of the difference in mean is shown as t-statistic based on Satterthwaite's unpair and unequal test. The significance of difference in median is shown as z-statistic based on Wilcoxon signed-rank test. ***, ** and * indicates significance at the 1%, 5% and 10% levels, respectively.

3.5 Conclusion

In Chapter 3, we present data and construct the measure of cultural diversity. The sample firms selected to investigate cultural diversity is from U.S. listed firms over a ten-year period from 2004 to 2013 and cultural diversity is constructed by using an entropy measure. Throughout this thesis, Hofstede's framework is used as the main measure of culture on account of its influence in academic research. Four other cultural measures: the GLOBE framework, egalitarianism, individualism, and trust are employed as alternative measures to ensure the robustness of our results. Therefore, the sample and measure of cultural diversity constructed in this chapter are ready for empirical analysis of the impact of cultural diversity on financial aspects as proposed in Chapter 2. Subsequently, we will use these data and measures in the following three chapters to investigate the effect of cultural diversity on firm value, capital structure, and dividend policy, respectively.

Chapter 4

Cultural Diversity and Firm Value

4.1 Introduction

Whether multinational firms facilitate value enhancement by international diversification is one of the most debated questions in finance research. Earlier studies, such as Agmon and Lessard (1977) and Errunza and Senbet (1981, 1984), show that multinational operations increase firm value by allowing firms to take advantage of market imperfections across countries.¹⁴ However, later studies, such as Christophe (1997), Denis *et al.* (2002), Fauver *et al.* (2004) and Moeller and Schlingemann (2005) provide empirical evidence that there is a valuation discount for multinational firms relative to purely domestic firms. Similarly, among multinationals, firm value is lower as the degree of international diversification increases. Why does the literature show contradictory results? Barnea *et al.* (1981) and Senbet and Taggart (1984) argue that to realize valuation enhancement through market imperfections can be difficult because international diversification also aggravates various frictions. These frictions can result in the costs of international diversification outweighing the benefits (Denis *et al.* 2002). We argue that cultural diversity within a multinational firm can represent one of those frictions.

Cultural diversity is an important characteristic of multinational firms. Multinational firms establish subsidiaries in different countries and are thus exposed to the local cultures of these countries, which can be significantly different from the culture

¹⁴ The idea of market imperfections through multinational operations is developed by Cohn and Pringle (1973), who argue that due to differences across markets, global diversification can reduce the risk premium component of the cost of capital. Errunza and Senbet (1981) suggest that market imperfections include three aspects: imperfections in real goods and factor markets, imperfections in financial markets, and different taxation across countries. Because of these imperfections, multinational firms manifest higher value by using their advantageous positions to explore market differences internationally, which purely domestic firms are not able to do.

of their home countries (Dean & Shenkar 2002; Meyer *et al.* 2011). In Chapter 2, we discussed the channels through which cultural diversity affects multinational firms. Based on the discussions, we argue that cultural diversity can affect firm value through these channels. Cultural differences may increase agency problems, which give rise to extra costs for the top managers to reconcile various cultural differences in subsidiaries (Roth & O'Donnell 1996). Further, cultural differences may increase information asymmetry, which creates barriers for outside investors to evaluate the performance of subsidiaries (Aabo *et al.* 2015; Huang 2015). In addition, cultural diversity may affect asset allocation and lead to inefficient investments (Dellestrand & Kappen 2012). Cultural diversity not only influences the overall organization and structure (Rosenzweig & Singh 1991; Sundaram & Black 1992) but also affects the strategy and efficiencies of multinational firms (Palich & Gomez-Mejia 1999). Therefore, if the frictions and costs of cultural diversity are considerably larger than the benefits of international diversification, we would expect a negative effect of cultural diversity on the value of multinational firms.

Using a sample of U.S. firms and the entropy index developed in Chapter 3, we find that cultural diversity is negatively related to the value of multinational firms after controlling for the firm- and country-level determinants and macroeconomic factors. We conduct several robustness checks. First, we show that the above result remains valid when we use alternative cultural and valuation measures. Second, we examine whether the relation between cultural diversity and firm value is persistent over time, particularly considering that the sample period covers the 2008 financial crisis. By including year fixed effects, implementing sub-sample period analyses, and using the Fama and MacBeth (1973) procedure, we demonstrate that the main result is robust over time. Finally, we address endogeneity concerns by following Guiso *et al.* (2009) and Ahern *et al.* (2015), using genetic diversity developed by Spolaore and Wacziarg (2016) as an instrument for cultural diversity.

To ascertain that the negative relation between cultural diversity and firm value is not influenced by other factors arising from international operations, we extend the main analysis in two ways. First, we investigate whether the degree of foreign operations affects the main result. Errunza and Senbet (1981, 1984) report that international operations enhance firm value. If this is the case, then it would be expected that a higher degree of foreign operations mitigates the negative effect of cultural diversity. However, we do not find any evidence of this mitigating effect. This result demonstrates the independence of the valuation effect of cultural diversity. Second, we examine whether host country characteristics affect the negative effect of cultural diversity. In particular, we consider the level of market development (Morck & Yeung 1991; Wells 1998), creditor rights (Gande *et al.* 2009; Nini *et al.* 2009), and government corruption (Husted 1999; Khatri *et al.* 2006; Zeume 2017) of host countries. The inclusion of these host country characteristics does not affect the negative relation between cultural diversity and firm value.

This chapter makes three important contributions to the literature. First, we contribute to culture and finance studies. While there are numerous studies about the relation between culture and finance, the exploration of the valuation effect of cultural diversity within a firm is relatively limited. Culture is shown to affect foreign direct investment (Guiso *et al.* 2009), cross-border mergers (Frijns *et al.* 2013; Ahern *et al.* 2015), international asset allocation (Beugelsdijk & Frijns 2010; Karolyi 2016), international equity and bond issuances (Siegel *et al.* 2011), and global venture capital investment (Nahata *et al.* 2014; Bottazzi *et al.* 2016). These studies, in general, document that the larger the degree of cultural differences between two countries, the lower the bilateral financial activities and cash-flows, and the more difficult the realization of benefits from bilateral financial transactions. Building on these studies, this chapter focuses on financial outcomes. Although the perspective of this chapter is different from

that of the papers above, our argument about the effect of cultural difference is similar to these papers, where cultural differences are associated with agency problems, information asymmetry and asset allocation efficiency. These frictions lead to a negative effect of cultural diversity on firm value.

Second, we contribute to multinational valuation studies. Using the unique data set containing the foreign subsidiaries of U.S. multinational firms, we study the influence of cultural diversity on firm value and meanwhile consider other country-level effects documented to affect the value of multinational firms, such as the development level (Morck & Yeung 1991), creditor rights (Gande *et al.* 2009) and government corruption (Zeume 2017) of host countries. In particular, we extend Denis *et al.* (2002), who find that an increase in global diversification destroys firm value, by showing that the negative effect of global diversification on firm value is associated with cultural diversity. While the negative valuation effect of cultural diversity is impervious, we confirm that operating in developed economies and in countries that have strong creditor rights can enhance firm value. These findings are in line with La Porta *et al.* (2002) who suggest that better legal and financial fundamentals provide a better protection for investments, and thus help value enhancement. The findings of this chapter extend the above study by showing that both culture and formal institutions are important to firm value in a multinational setting.

In addition, we contribute to firm diversification studies by distinguishing between cultural diversity and geographical diversity. Landier *et al.* (2009) and Bernile *et al.* (2015) document that geographical diversity is also associated with agency problems and information asymmetry, which affect corporate decision-making. However, empirical evidence provides mixed results. For example, Deng and Elyasiani (2008) find that geographical diversity increase firm value due to risk reduction; whereas Goetz *et al.* (2013) show that geographical diversity reduces firm value because of increased agency costs. Therefore, it is still unclear whether the frictions are associated with geographical

diversity affecting firm value. Given that global diversification is accompanied by both cultural diversity and geographical diversity, it is important to identify whether cultural diversity is the main channel through which costs of international diversification are more likely to arise.

The remainder of this chapter is organized as follows. Section 4.2 reviews the literature and identifies the research gap. Section 4.3 constructs variables and describes data. Section 4.4 presents the results. Section 4.5 concludes the chapter.

4.2 The effect of cultural diversity: An explanation

Chapter 2 has briefly discussed how cultural diversity can affect firm value. In this section, we explain the valuation effect of cultural diversity in more detail. While the aim of a firm expanding overseas is to seek revenues and growth opportunities, global diversification inevitably engenders cultural diversity. The effect of cultural diversity is twofold. On the one hand, interaction within culturally diversified groups can promote problem-solving and thus enhance performance in the long-run (Watson *et al.* 1993). As overseas expansions are driven by economic motives, firms tend to establish businesses in fast-growing markets or markets with the resources that the firm needs, even though these markets may be culturally distant from the home market (Hart 1995). To integrate the core competitive advantages of multinational firms with the natural endowments of local markets, it is imperative for firms to accept and manage these cultural differences. In turn, under the trend of global economic integration, expanding to culturally distant markets provides a firm with valuable learning opportunities that can facilitate the firm's long-term growth (Barkema *et al.* 1996).

On the other hand, cultural diversity gives rise to frictions including, but not limited to, agency problems, information asymmetry, and inefficient asset allocation. Cultural diversity increases agency problems at both parent and subsidiary levels. Comparing to

the agency conflict between shareholders and top managers, the agency conflict between shareholders and subsidiary managers can be higher. Given that the disclosure of financial information is not compulsory for subsidiaries (Hope & Thomas 2008), shareholders would have more difficulties to understand and evaluate subsidiaries located in distant cultures. In this case, it would be more costly for shareholders to monitor subsidiary managers. Further, cultural diversity intensifies agency problems between the top managers of multinational firms and subsidiary managers (Roth & O'Donnell 1996). Thomas and Ravlin (1995) and Chang and Taylor (1999) show that cultural differences have a negative impact on the effectiveness of managerial control that parent firms exert over subsidiaries. These studies suggest that a higher cultural diversity weakens subsidiary managers' abilities to view the firm as a whole. Consequently, the goal of maximizing shareholder interests is likely to be compromised.

Second, the information environment of multinationals can deteriorate with cultural diversity, intensifying information asymmetry between multinational firms and shareholders.¹⁵ Huang (2015) provides evidence that cultural distance impedes the speed of information incorporation and finds that the investors for U.S. multinational firms respond more slowly to information from Asian countries, less slowly to information from European countries, and fastest to information from English-speaking countries. Further, Shroff *et al.* (2014) and Aabo *et al.* (2015) indicate that the cultural dispersion of multinationals is significantly and positively associated with the opacity of a firm. This suggests that the more a multinational's operations span diverse cultures, the worse the information quality perceived by investors. These studies demonstrate that informational frictions caused by cultural diversity are closely related to the cultural orientation of

¹⁵ Sperber and Hirschfeld (2004) show that methods of information distribution are repeated and constant within a cultural group but not beyond it. Consequently, the process of information generation, delivery, and interpretation in one cultural group are different from that in another. Therefore, the patterns of information processing and the connotation of information are easily predicted and understood within the same culture, but it is difficult to predict and understand information coming from different cultures.

multinational firms. To compensate for what they perceive to be a weakened information environment, investors are likely to require higher returns as cultural diversity increases.

Finally, cultural diversity may reduce the efficiency of asset allocation within multinationals. Dellestrand and Kappen (2012) suggest that cultural differences between parent firm and subsidiaries are likely to result in serious cross-subsidization issues, where culturally proximate foreign subsidiaries are more likely to be subsidized, even if these subsidiaries are less profitable than culturally distant foreign subsidiaries. Shi and Tang (2015) investigate the effect of in-group favouritism associated with cultural similarity and find that investments based on cultural similarity have negative announcement returns. The above studies suggest that if a firm operates in various cultures, capital allocation decisions by the firm can be affected by familiarity, which can result in inefficient asset allocations and eventually damage firm value.

The impact of cultural diversity on operating performance has been considered by a number of studies. Gómez-Mejia and Palich (1997) draw from a sample of 442 Fortune 500 firms over 1985-1989 and 228 firms over 1990-1994, and Hutzschenreuter and Voll (2008) investigate a sample of 91 listed German multinational firms over the period 1994-2004. These results show that cultural diversity does not have a consistent significant impact on a firm's operating performance. There have been limited studies investigating the valuation effect of cultural diversity within a firm. Siegel *et al.* (2011) look into cross-border M&A transactions and find that the greater the cultural differences, the lower the post-M&A marginal q . This result implies that a higher level of cultural diversity can destroy firm value.

Overall, prior studies suggest that global diversification matters for firm value and that an increased global diversification gives rise to a higher degree of cultural diversity within multinational firms. However, the valuation effect of cultural diversity has not yet been explicitly examined. The purpose of this chapter is to address this research gap.

Given the pros and cons of cultural diversity discussed above, we conjecture that costs and frictions associated with cultural diversity outweigh benefits. Therefore, the main hypothesis of this chapter is that cultural diversity negatively affects multinational firm value. By examining this hypothesis, this chapter provides insights into the relation between global diversification and firm value.

4.3 Variables

To examine the effect of cultural diversity on firm value, we also needed to find ways to measure firm value. This is in addition to proxies for cultural diversity, which we constructed in Section 3. The main measure of firm value is Tobin's Q, which is commonly used in international diversification studies (Morck and Yeung (1991), Christophe (1997), and Gande *et al.* (2009)). Tobin's Q is the ratio of the market value of assets to the replacement value of assets at the end of a calendar year. Following Christophe (1997), we compute the numerator of Tobin's Q as the book value of total assets plus the market value of equity minus the book value of equity and the denominator of Tobin's Q as the book value of total assets.¹⁶ The advantage of using Tobin's Q to capture the benefits and costs of diversification is that, according to Lang and Stulz (1994), it incorporates capitalized value and therefore is comparable across firms. However, for robustness purpose, we use two other alternatives for firm value, namely, market value of capital to the book value of total assets as well as the ratio of enterprise value to the book value of assets.

The summary statistics for cultural diversity are shown in Table 4-1. The mean and the median of cultural diversity of the sample firms decreases at the beginning of the sample period and reaches a low point in 2006. After 2006, both mean and median

¹⁶ The original version of this measure of Tobin's Q is developed by Chung and Pruitt (1994), and is well-accepted to firm diversification studies, such as Lang and Stulz (1994) and Christophe (1997).

increase steadily. The summary statistics for cultural diversity suggest that cultural diversity within a firm changes over time. The average Tobin's Q in our sample is 2.17, which is higher than Tobin's Q calculated by 1984 data in Lang and Stulz (1994) of 1.11 and Tobin's Q calculated by 1994-2002 data in Gande *et al.* (2009) of 1.88. This indicates that the overall firm market value has increased over time.

To investigate the effect of cultural diversity on firm value, we control for several well-documented firm characteristics. Following Denis, Denis, and Yost (2002), we control for firm size, leverage, operating margin, capital expenditures, and intangible assets. In addition to the above variables, we also control for two firm diversification measures: geographical diversity and business diversification. Prior studies, such as Deng and Elyasiani (2008) and Goetz *et al.* (2013) find that geographical diversity affects firm value. Because global diversification can be accompanied by both cultural diversity and geographical diversity, it is important to distinguish the effect of cultural diversity from that of geographical diversity. Finally, the effect of business diversification on valuation discounts has been documented by Lang and Stulz (1994) and Berger and Ofek (1995). Following these studies, we use the number of business segments as a proxy for business diversification.

Following Siegel *et al.* (2011) and Ahern *et al.* (2015), we control a range of country-level variables. First, we control for the proportion of subsidiaries operating in countries that have free trade agreements, tax treaties, and investment treaties with the U.S. These treaties and agreements may offer protection for cross-border investments and mechanisms for resolving trade disputes, reducing the barriers for U.S. firms to trade and invest overseas, and facilitating valuation improvement. Second, we control for three measures of macroeconomic risks (growth rate volatility, inflation rate volatility and exchange rate volatility), as prior studies document that macroeconomic risks can be contagious across countries and fundamentally affect the value of multinational firms

(Desai *et al.* 2008). Finally, we follow Siegel *et al.* (2011) to control for shared language, law, and colonial relations. In Appendix, we provide detailed descriptions of the above variables.

As for the summary statistics for control variables, we notice that the mean of operating revenue to sales is -0.40. The negative figure is in line with Gande *et al.* (2009) who report an average EBIT to sales of -0.652. In addition, industry diversification as measured by the number of segments has a mean and median of 2.47 and 2, respectively, compared to a mean and median of 2.54 and 2 reported in Lang and Stulz (1994).

4.4 Results

Using variables constructed in the previous section and samples selected in Chapter 3, this section reports empirical results. We first present the main result of the effect of cultural diversity on firm value, then check the robustness of the results. Lastly, we examine the effect of cultural diversity to account for other factors regarding international operations.

4.4.1 Main results

To evaluate the effect of cultural diversity on firm valuation, we use a model that controls for the aforementioned variables as follows,

$$Tobin's\ Q_{i,t} = f \left(\begin{array}{c} \text{Cultural diversity}_{i,t}, \text{Firm-level controls}, \\ \text{Country-level controls}, \\ \text{Time dummies, Industry dummies} \end{array} \right) \quad (4A)$$

where *Tobin's Q_{i,t}* is the valuation measure of firm *i* at time *t*, *Cultural diversity_{i,t}* is the measure of cultural diversity as described in Chapter 3. *Firm-level controls* include firm size, leverage, profit margin, capital expenditures, intangible assets, geographical diversity and business diversification. In *Country-level controls*, we include three categories of variables: bilateral or regional treaties (agreements), macro-

Table 4-1: Summary statistics for cultural diversity, firm value and controls

	Mean	Median	Std. Dev	Min	Max	Observations
Cultural diversity (CD)	2.48	1.54	2.57	0	9.53	16,658
2004	2.46	1.75	2.27	0	9.53	1,216
2005	2.31	1.57	2.29	0	9.53	1,424
2006	1.65	1.01	1.90	0	9.53	1,728
2007	2.14	1.25	2.41	0	9.53	1,792
2008	2.38	1.45	2.55	0	9.53	1,796
2009	2.52	1.55	2.60	0	9.53	1,785
2010	2.73	1.80	2.71	0	9.53	1,651
2011	2.77	1.80	2.76	0	9.53	1,650
2012	2.89	1.96	2.81	0	9.53	1,810
2013	2.95	1.96	2.85	0	9.53	1,806
Difference	0.49***	0.21**	--	--	--	--
(2013-2004)	(5.20)	(2.13)	--	--	--	--
<i>Alternative cultural measures:</i>						
CD_GLOBE	2.39	1.52	2.42	0	8.84	16,658
CD_ Egalitarianism	0.74	0.51	0.71	0	2.49	16,658
CD_ Individualism	0.55	0.33	0.57	0	2.13	16,658
CD_ Trust	0.68	0.43	0.73	0	2.83	16,658
<i>Firm value measures:</i>						
Tobin's Q	2.17	1.65	1.61	0.57	10.14	22,441
Market capital/Total assets	2.16	1.64	1.59	0.59	9.97	22,438
Enterprise value/Total assets	1.62	1.18	1.46	0.03	8.83	22,433
<i>Firm-level controls:</i>						
Firm size (ln(Total assets))	13.92	13.89	1.98	9.53	18.74	22,439
Leverage (Equity multiplier)	2.64	1.86	2.80	0.00	21.54	22,473
Operating revenue/Sales	-0.40	0.07	2.92	-25.54	0.45	23,502
Capital expenditure /Sales	0.09	0.03	0.22	0.00	1.68	23,391
Intangible/Sales	0.21	0.13	0.23	0.00	1.00	20,212
Geographical diversity	6.40	3.96	6.78	0.00	25.34	16,599
Industrial diversification	2.47	2.00	1.76	1.00	10.00	17,898
<i>Country-level controls:</i>						
Shared language	0.20	0.14	0.23	0.00	1.00	16,692
Shared law	0.25	0.20	0.24	0.00	1.00	16,692
Colonial relations	0.14	0.07	0.21	0.00	1.00	16,692
Free trade agreement	0.12	0.09	0.16	0.00	1.00	16,692
Tax treaty	0.43	0.42	0.30	0.00	1.00	16,692
Investment treaty	0.02	0.00	0.05	0.00	1.00	16,692
Growth rate volatility	2.47	2.45	1.31	0.34	8.06	16,660
Inflation rate volatility	0.84	0.73	0.63	0.11	4.26	16,660
Exchange rate volatility	18.61	14.25	19.44	0.29	104.69	16,660
<i>Influencing factors:</i>						
Foreign to total assets (FATA)	0.12	0.03	0.19	0.00	0.92	18,329
Advanced economies	0.38	0.33	0.29	0.00	1.00	16,692
Credit rights	0.40	0.38	0.16	0.00	1.00	14,367
Corruption	0.27	0.24	0.09	0.11	1.00	14,367

This table reports descriptive statistics for the sample firms. All variables are detailed defined in Appendix: Variable Description. "Difference" reports the difference in mean using Satterthwaite's unequal test and the difference in median using the Wilcoxon rank-sum test. Data are winsorized at 1%. ***, ** and * indicates significance at the 1%, 5% and 10% levels, respectively.

economic risks, and common language, law and colonial relations. In all regressions, we include year fixed effects and industry fixed effects to control for worldwide and industry-wide economic shocks. All standard errors are White-corrected standard errors and robust to heteroscedasticity.

Table 4-2 reports results for the effect of cultural diversity on Tobin's Q. The first column of Table 4-2 considers cultural diversity while controlling for firm-level variables. The result shows that all variables are significant. More importantly, the coefficient on cultural diversity is negative and significant at the 5% level. The negative effect of cultural diversity on Tobin's Q suggests that the frictions associated with cultural diversity outweigh the potential benefits of operating in culturally diverse countries. In Column 2, we control further for bilateral or regional treaties (agreements). The inclusion of these variables does not alter the significant and negative relation between cultural diversity and Tobin's Q. Next, we control for economic growth rate volatility, inflation volatility and exchange rate volatility in Column 3, and find that the negative effect of cultural diversity remains.

The above results may reflect other national similarities rather than culture. For example, Siegel *et al.* (2011) argue that common language and colonial ties may represent similarities between countries but these similarities are different from cultural similarity. Further, Ahern *et al.* (2015) claim that a shared legal system, which belongs to formal institutions, is different from culture. To isolate the effect of cultural diversities from these national similarities, Column 4 further includes shared law and colonial relations as control variables. The result shows that the negative effect of cultural diversity on firm value become stronger compared with the previous three specifications, as shown by the magnitude of the coefficient on cultural diversity. The negative effect are significant at the 1% level. The result in Column 4 suggests that the effect of cultural diversity on firm value is also economically significant. On average, firms have a Tobin's Q that is 0.14

Table 4-2: The effect of cultural diversity on firm value

Independent variables	Tobin's Q			
	(1)	(2)	(3)	(4)
Cultural diversity	-0.047** (-2.33)	-0.121*** (-5.70)	-0.135*** (-6.14)	-0.141*** (-5.68)
Firm size	0.240*** (30.32)	0.283*** (33.89)	0.284*** (33.94)	0.291*** (33.50)
Leverage	-0.035*** (-6.32)	-0.029*** (-5.40)	-0.028*** (-5.25)	-0.028*** (-5.19)
Operating margin	-0.143*** (-4.83)	-0.140*** (-5.34)	-0.139*** (-5.43)	-0.139*** (-5.41)
Capital expenditure to sales	-0.533*** (-5.81)	-0.595*** (-6.75)	-0.607*** (-6.92)	-0.607*** (-6.92)
Intangibles to sales	-0.747*** (-14.57)	-0.758*** (-15.06)	-0.760*** (-15.12)	-0.752*** (-15.01)
Business diversification	-0.173*** (-24.90)	-0.148*** (-22.20)	-0.147*** (-22.04)	-0.145*** (-21.76)
Geographical diversity	0.018** (2.43)	0.015** (2.04)	0.022*** (2.91)	0.015* (1.68)
Free trade agreement		-0.278** (-2.47)	-0.330*** (-2.71)	-0.23 (-1.47)
Tax treaty		1.416*** (17.71)	1.401*** (15.94)	1.488*** (13.19)
Investment treaty		-0.393 (-1.44)	-0.342 (-1.23)	-0.217 (-0.76)
Growth rate volatility			0.089*** (3.55)	0.061** (2.26)
Inflation rate volatility			-0.120*** (-5.10)	-0.125*** (-5.30)
Exchange rate volatility			-0.004** (-2.01)	-0.003 (-1.35)
Shared language				-0.898*** (-3.43)
Shared law				0.596** (2.50)
Colonial relation				0.154 (0.92)
Constant	0.549*** (4.87)	-0.940*** (-6.67)	-0.984*** (-5.60)	-0.975*** (-5.30)
Year dummy	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes
Adjusted R^2	0.183	0.222	0.224	0.225
Number of observations	10,581	10,581	10,581	10,581

This table presents the results from ordinary least square regressions of firm value on cultural diversity and a set of control variables. The dependent variable is firm value as measured by Tobin's Q. All variables are defined in Appendix: Variable Description. In parentheses, we report t-statistics. Standard errors are White-corrected. The sample covers the period 2004-2013. ***, ** and * indicates significance at the 1%, 5% and 10% levels, respectively.

lower than firms with one unit lower in cultural diversity. This is a remarkable effect as it corresponds to a 6.5% decrease in unconditional Tobin's Q. Therefore, the result in Column 4 demonstrates that cultural diversity is not a proxy for other national characteristics and that the negative valuation effect of cultural diversity is statistically and economically significant.

As for country-level control variables, the tax treaty has a consistently positive effect on firm value, indicating that firms can have a higher value if a greater proportion of foreign operations are in the countries that have tax treaties with the United States. This result is in line with existing literature, suggesting that taxation is an important consideration for the internal asset allocation of multinational firms (Barrios *et al.* 2012; Karkinsky & Riedel 2012). Further, inflation risk is negatively related to firm value. This is consistent with our expectations as not all firms can transfer inflation to consumers. Finally, the coefficients on shared law are positive and in line with La Porta *et al.* (1998), suggesting that operating in common law countries can enhance firm value.

As for the two diversification control variables, it is worth noting that business diversification is negatively associated with firm value. This result is in line with prior corporate diversification studies, such as Lang and Stulz (1994). We also observe that geographical diversity has a positive impact on firm value. This result is in line with Gande *et al.* (2009) suggesting that the valuation discount of global diversification documented by Denis *et al.* (2002) may not be caused by the geographical distribution of firm operations. Instead, the results demonstrate that the negative valuation effect of global diversification is consistently associated with cultural diversity.

4.4.2 Robustness tests

In this section, we carry out a range of robustness checks using alternative culture and valuation measures, different periods, and addressing endogeneity concerns.

4.4.2.1 *Alternative culture frameworks*

We begin robustness tests by employing several alternative measures for cultural dimensions and frameworks as discussed in Chapter 3. The alternative cultural measures include: GLOBE's (2004) cultural value framework, Schwartz's egalitarianism scores in the 2005 release of cultural values dataset (Siegel et al., 2011), and the World Value Survey (WVS) of individualism and trust. In Table 4-3, we report the valuation effects of cultural diversity by using the aforementioned alternative measures of culture. We include all control variables in each specification. The results confirm the main result and show that all four measures provide negative coefficients for cultural diversity and are statistically significant at the 1% level.

All control variables, except geographical diversity, show signs consistent with the main results. Geographical diversity here shows insignificant or negative effects on firm value, contradicting to its positive valuation effect in the main result. The inconsistent effect of geographical diversity on firm value reflects disagreement in the literature. Some find that geographical diversity enhances firm value (Deng & Elyasiani 2008) and others find that it reduces firm value (Goetz *et al.* 2013). One possible explanation is that geographical diversity itself does not have a consistent effect on firm value; it is frictions, costs, and benefits along with geographical diversity that matters. If this is the case, then the above results suggest that cultural diversity is one of these frictions that negatively affect firm value.¹⁷

4.4.2.2 *Alternative measures of firm value*

To ensure the above results are robust to valuation measures, we re-estimate Equation (4A) using two alternative dependent variables: the ratio of the market value of

¹⁷ An alternative argument by Siegel *et al.* (2011) is that geographical distance can never directly capture cultural distance. For instance, operating in Mexico may not necessarily generate higher value for a U.S. firm, compared to operating in countries with a greater geographical distance.

Table 4-3: Cultural diversity and firm value -- alternative culture measures

Independent variables	Tobin's Q			
	(1)	(2)	(3)	(4)
CD_GLOBE	-0.118*** (-4.89)			
CD_Egalitarianism		-0.381*** (-5.33)		
CD_Trust			-0.187*** (-3.52)	
CD_Individualism				-0.174*** (-2.88)
Firm size	0.290*** (33.39)	0.290*** (33.30)	0.290*** (33.38)	0.288*** (32.98)
Leverage	-0.029*** (-5.35)	-0.029*** (-5.37)	-0.029*** (-5.25)	-0.029*** (-5.38)
Operating margin	-0.164*** (-5.60)	-0.146*** (-5.56)	-0.150*** (-5.56)	-0.149*** (-5.58)
Capital expenditure to sales	-0.639*** (-7.28)	-0.635*** (-7.17)	-0.616*** (-7.02)	-0.624*** (-7.05)
Intangible to sales	-0.746*** (-14.78)	-0.731*** (-14.45)	-0.743*** (-14.65)	-0.732*** (-14.48)
Business diversification	-0.147*** (-21.88)	-0.145*** (-21.62)	-0.144*** (-21.39)	-0.146*** (-21.86)
Geographical diversity	0.005 (0.64)	-0.003 (-0.44)	-0.015** (-2.34)	-0.022*** (-3.99)
Free trade agreement	-0.22 (-1.38)	-0.507*** (-3.15)	-0.164 (-1.04)	-0.318** (-2.00)
Tax treaty	1.432*** (13.09)	1.569*** (13.19)	1.295*** (12.27)	1.371*** (12.66)
Investment treaty	-0.416 (-1.43)	-0.709** (-2.48)	-0.054 (-0.19)	-0.271 (-0.94)
Growth rate volatility	0.056** (2.04)	0.04 (1.45)	0.050* (1.78)	0.052* (1.88)
Inflation rate volatility	-0.114*** (-4.70)	-0.113*** (-4.67)	-0.106*** (-4.44)	-0.113*** (-4.68)
Exchange rate volatility	-0.003 (-1.23)	-0.004* (-1.93)	-0.002 (-0.87)	-0.002 (-0.87)
Shared language	-0.843*** (-3.17)	-0.683** (-2.53)	-0.899*** (-3.35)	-1.068*** (-3.95)
Shared law	0.633** (2.58)	0.620** (2.53)	0.772*** (3.20)	1.005*** (4.31)
Colonial relation	0.175 (1.03)	0.108 (0.64)	0.291* (1.68)	0.178 (1.04)
Constant	-0.975*** (-5.28)	-0.931*** (-5.03)	-1.000*** (-5.37)	-0.993*** (-5.34)
Year dummy	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes
Adjusted R^2	0.225	0.226	0.225	0.225
Number of observations	10,540	10,535	10,525	10,525

This table presents the results from ordinary least square regressions of firm value on cultural diversity, which is measured by a set of different cultural framework and dimensions. All variables are described in Appendix. T-statistics are reported in parentheses. Standard errors are White-corrected. ***, ** and * indicates significance at the 1%, 5% and 10% levels, respectively.

capital to the book value of total assets (MC/TA) and the ratio of enterprise value to the book value of total assets (EV/TA). The MC/TA is a commonly used alternative valuation measure in the corporate diversification literature, such as Berger and Ofek (1995) and Denis et al. (2002), and the market value of capital is defined as the market value of equity plus the book value of debt. Further, Ferreira and Laux (2007) suggest that enterprise value reflects the true value of a firm recognized in capital market transactions and is important for evaluating information flows and investment efficiency associated with corporate finance decisions. Similar to Ferreira and Laux (2007), we define enterprise value as the market capitalization plus debt, minority interest and preferred shares, minus total cash and cash equivalents. Table 4-4 reports regression results using these alternative valuation measures. Panel A presents results for the ratio of market capital to total assets. The negative effect of cultural diversity obtained here is similar to the main result. Panel B presents the results for the ratio of enterprise value to total assets. The negative effect of cultural diversity obtained in these regressions, though slightly smaller compared to the main result, remains significant. Hence, the results are not driven by choice of valuation measures.

4.4.2.3 Robustness over time

There is a decrease in the mean and median of cultural diversity before 2006 and an increase after that until 2013 as shown in Table 4-1 summary statistics. A relevant concern regarding this trend is that the results may be driven by business cycles. It might be the case that during the boom periods of the U.S. economy, firms partially shift their businesses back to the domestic market, thus reducing cultural diversity. Meanwhile, given that the booming economy could promote firm value, it is possible that the business cycle would cause the negative relation between cultural diversity and firm value. Further, as the sample includes the year 2008 and 2009, the negative effect of cultural diversity on firm value may have been driven by the financial crisis. Giannetti and Laeven (2012)

Table 4-4: Cultural diversity and firm value -- alternative valuation measures

Independent variables	Firm value			
	(1)	(2)	(3)	(4)
Panel A: Market capital to total assets as the dependent variable (MC/TA)				
Cultural diversity	-0.046** (-2.32)	-0.118*** (-5.66)	-0.133*** (-6.12)	-0.141*** (-5.73)
Firm level controls	Yes	Yes	Yes	Yes
Tax/Trade/Investment treaty	No	Yes	Yes	Yes
Economic risks	No	No	Yes	Yes
Country level controls	No	No	No	Yes
Constant	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes
Adjusted R^2	0.188	0.226	0.228	0.229
Number of observations	10,581	10,581	10,581	10,581
Panel B: Enterprise value to total assets as the dependent variable (EV/TA)				
Cultural diversity	-0.030 (-1.59)	-0.093*** (-4.68)	-0.103*** (-5.00)	-0.117*** (-5.02)
Firm level controls	Yes	Yes	Yes	Yes
Tax/Trade/Investment treaty	No	Yes	Yes	Yes
Economic risks	No	No	Yes	Yes
Country level controls	No	No	No	Yes
Constant	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes
Adjusted R^2	0.154	0.185	0.186	0.188
Number of observations	10,548	10,548	10,548	10,548

This table presents the results from ordinary least square regressions of two alternative measures of firm value on cultural diversity and control variables. Two measures of firm value are market capital to total assets and enterprise value to total assets. Market capital is defined as the market value of equity minus book value of equity plus the book value of total assets at the end of the calendar year. Enterprise value is calculated as the market capitalization plus debt, minority interest and preferred shares, minus total cash and cash equivalents at the end of the calendar year. All variables are defined in Appendix: Variable Description. In parentheses, we report t-statistics. Standard errors are White-corrected standard errors and robust to heteroscedasticity. The sample covers the period 2004-2013. ***, ** and * indicates significance at the 1%, 5% and 10% levels, respectively.

suggest that during the financial crisis, cultural unfamiliarity exacerbates home bias, leading to a large amount of capital backflow diminishing shareholder value. While we include year dummies to control for overall valuation effects each year, the above concerns may not be mitigated, as observations for each sample firm may be auto-correlated and not independent across time.

We address the issues raised above in two ways. First, we split the sample into two sub-periods: the pre-crisis period (2004-2008) and the post-crisis period (2009-2013), and estimate the valuation effect of cultural diversity for each sub-period. Second, in the spirit of Fama and MacBeth (1973), we estimate the regressions separately for each of the ten years. Then, we calculate the annual average coefficient estimates and compute the t-statistics based on the standard deviation of annual estimates for each firm. Standard errors are heteroscedasticity and autocorrelation corrected by using Newey and West's (1987) approach.

In Table 4-5, we report the results. In Columns 1 and 2, we examine the valuation effect of cultural diversity for the pre-crisis and post-crisis periods, respectively. The results show that indeed, the magnitudes of the coefficients on cultural diversity are larger during 2009-2013 than 2004-2008, suggesting that the effect of cultural diversity is relatively stronger in the post-crisis period. Nevertheless, the effect of cultural diversity is significant at the 1% level in both periods, suggesting that macroeconomic shocks not fundamentally change the negative valuation effect associated with cultural diversity. Column 3 reports the results of the Fama and MacBeth (1973) approach, showing that the negative coefficient on cultural diversity remains and that the magnitude of the coefficient is close to the main result. Findings in this section offer evidence that the business cycle does not fundamentally affect the negative valuation effect of cultural diversity.

Table 4-5: Cultural diversity and firm value -- subsample period analysis

Independent variables	2004-2008	2009-2013	Full sample (Fama-MacBeth)
Cultural diversity	-0.103*** (-2.79)	-0.164*** (-4.94)	-0.134*** (-5.23)
Firm size	0.279*** (23.03)	0.299*** (25.32)	0.287*** (31.64)
Leverage	-0.016* (-1.68)	-0.037*** (-5.86)	-0.029*** (-6.23)
Operating margin	0.014 (0.24)	-0.167*** (-6.25)	-0.008 (-0.08)
Capital expenditure to sales	-0.431*** (-3.24)	-0.709*** (-5.93)	-0.520*** (-9.04)
Intangible to sales	-0.721*** (-9.61)	-0.768*** (-11.36)	-0.728*** (-17.16)
Business diversification	-0.126*** (-14.53)	-0.160*** (-16.42)	-0.141*** (-12.91)
Geographical diversity	0.006 (0.48)	0.015 (1.28)	0.012 (1.47)
Free trade agreement	-0.434** (-2.09)	-0.077 (-0.35)	-0.294* (-2.22)
Tax treaty	1.463*** (8.59)	1.609*** (10.40)	1.581*** (19.81)
Investment treaty	-0.565* (-1.80)	-0.074 (-0.17)	-0.279 (-1.78)
Growth rate volatility	0.049 (1.26)	0.055 (1.53)	0.052** (3.04)
Inflation rate volatility	-0.144*** (-3.96)	-0.086*** (-2.79)	-0.128*** (-4.82)
Exchange rate volatility	0.004 (1.14)	-0.010*** (-3.16)	-0.001 (-0.32)
Shared language	-1.173*** (-2.65)	-0.878*** (-2.66)	-1.240*** (-3.72)
Shared law	0.939** (2.38)	0.481 (1.59)	0.900** (3.04)
Colonial relations	-0.122 (-0.51)	0.342 (1.41)	0.045 (0.25)
Constant	-1.422*** (-6.23)	-1.104*** (-4.54)	-1.975*** (-13.13)
Year dummy	Yes	Yes	No
Industry dummy	Yes	Yes	Yes
(Adjusted) R^2	0.233	0.228	0.218
Number of observations	4,959	5,622	10,581

This table presents the results from ordinary least square regressions for two sub-periods and the Fama-MacBeth approach for the whole sample of firm value on cultural diversity and a set of control variables. The dependent variable is firm value as measured by Tobin's Q. All variables are detailed in Appendix: Variable Description. In parentheses, we report t-statistics. Standard errors are White-corrected. The sample covers the period 2004-2013. ***, ** and * indicates significance at the 1%, 5% and 10% level, respectively.

4.4.2.4 Endogeneity concerns

While the above results offer strong evidence that cultural diversity has a negative effect on firm value, one concern is that this effect might be affected by endogeneity in the sense that it may be not that cultural diversity reduces firm value, but that firms with lower valuations tend to have higher levels of cultural diversity. This is a relevant concern as managers of low-value firms may try to avoid shareholder monitoring by diversifying internationally (Dastidar 2009). To address this concern, we adopt an instrumental variable approach. Following Guiso *et al.* (2009) and Ahern *et al.* (2015), we use genetic diversity as an instrument for cultural diversity. While “genes and culture are often thought of as opposite ends of the nature-nurture spectrum” (Way & Lieberman 2010), genetic differences reflect the history of invasions and hence cultural roots (Guiso *et al.* 2009).¹⁸ Specifically, we use weighted genetic distances between the U.S. and foreign countries developed by Spolaore and Wacziarg (2009, 2016), and then apply this measure of genetic distances to Equation (3A) to construct the instrumental variables: genetic diversity.¹⁹

In Table 4-6, we report the results of the instrumental variable regressions. Column 1 reports the first-stage regression. Genetic diversity has the expected positive sign and is highly significant. This suggests that the chosen instrumental variable is not a poor predictor of cultural diversity, the potentially endogenous variable, and thus it could be used in the second-stage equation. The first-stage regression also shows that all country-level variables, except shared language, are significantly related to cultural diversity. This is consistent with Fearon (2003), who documents that language commonality does not represent the sense of common identity in many regions. As for firm-level variables, firm

¹⁸ A large body of scientific theory documents that there is a culture-gene coevolution (see Chudek and Henrich (2011)). For example, Danchin *et al.* (2004) find that cultural evolution affects genetic evolution. On the other hand, Way and Lieberman (2010) report that genetic variations lead to cultural differences.

¹⁹ The pairwise correlation between genetic diversity and cultural diversity is 0.47.

size is positively related to cultural diversity and intangible to sales is negatively related. We observe that the first-stage for F-statistics is 8,171. This exceeds the threshold value of ten suggested by Stock *et al.* (2002) and indicates the validity of the instrument.

Columns 2 to 4 in Table 4-6 reports the results of the second stage regressions where dependent variables are Tobin's Q, the ratio of market capital to total assets (MC/TA), and the ratio of enterprise value to total assets (EV/TA), respectively. We find that controlling for endogeneity inflates the magnitudes of coefficients, but the main results that cultural diversity lowers firm value are identical to the previous tests. Thus, the negative relation between cultural diversity and firm value can be interpreted casually. That is, the higher the cultural diversity, the lower the firm value. In short, the findings in this section confirm the main results and suggest that endogeneity issues do not affect the negative effect of cultural diversity on firm value.

4.4.3 International operations, cultural diversity and firm value

Existing literature has documented that factors other than cultural diversity generated in the process of global diversification can affect firm value. In this section, we investigate whether these factors influence the valuation effect of cultural diversity.

4.4.3.1 Cultural diversity and the degree of foreign operations

One concern related to the above findings is the degree of foreign operations. There are two strands of competing literature explaining the valuation effect as a function of foreign operations. On the one hand, Errunza and Senbet (1981, 1984) and Gande *et al.* (2009) find that a higher degree of foreign operations enhances firm value. The main argument of this strand of literature is that larger foreign operations may achieve diversification benefits that investors may be unable to achieve due to barriers to direct overseas investment. If this argument holds, then it would be expected that a higher degree of foreign operations could mitigate the negative effect of cultural diversity.

Table 4-6: Cultural diversity and firm value -- instrumental variables regressions

Dependent variable	Cultural Diversity	Tobin's Q	MC/TA	EV/TA
	First stage	Second stage		
Independent variable	(1)	(2)	(3)	(4)
Genetic diversity	4.372*** (7.56)			
Cultural diversity		-1.102*** (-3.78)	-1.090*** (-3.77)	-0.935*** (-3.36)
Firm size	0.040*** (11.38)	0.330*** (22.13)	0.333*** (22.55)	0.299*** (21.07)
Leverage	0.002 (1.27)	-0.025*** (-4.35)	-0.028*** (-5.01)	-0.036*** (-7.02)
Operating margin	-0.010 (-1.11)	-0.149*** (-6.09)	-0.148*** (-6.17)	-0.100*** (-3.83)
Capital expenditure to sales	-0.064 (-1.20)	-0.671*** (-6.29)	-0.669*** (-6.46)	-0.316*** (-3.39)
Intangible to sales	-0.047** (-2.08)	-0.799*** (-14.21)	-0.794*** (-14.33)	-0.487*** (-9.33)
Business diversification	0.001 (0.18)	-0.143*** (-19.20)	-0.144*** (-19.41)	-0.122*** (-17.56)
Geographical diversity	0.325*** (138.90)	0.330*** (3.44)	0.326*** (3.43)	0.276*** (3.02)
Free trade agreement	0.735*** (9.92)	0.489* (1.73)	0.486* (1.73)	0.551** (2.05)
Tax treaty	1.134*** (23.51)	2.578*** (7.28)	2.550*** (7.29)	2.206*** (6.57)
Investment treaty	1.337*** (5.91)	1.053* (1.94)	1.012* (1.89)	1.068** (2.12)
Growth rate volatility	-0.131*** (-7.06)	0.029 (0.90)	0.027 (0.85)	0.027 (0.91)
Inflation rate volatility	-0.008*** (-7.30)	-0.247*** (-5.28)	-0.244*** (-5.28)	-0.210*** (-4.69)
Exchange rate volatility	-0.032** (-2.19)	-0.010*** (-3.19)	-0.010*** (-3.21)	-0.008*** (-2.60)
Shared language	-0.170 (-1.17)	-1.058*** (-3.60)	-1.107*** (-3.80)	-1.017*** (-3.73)
Shared law	-2.314*** (-18.42)	-1.640** (-2.25)	-1.591** (-2.20)	-1.393** (-2.00)
Colonial relation	0.414*** (5.57)	0.564** (2.51)	0.568** (2.56)	0.470** (2.20)
Constant	0.118 (1.61)	-0.462** (-2.54)	-0.492*** (-2.75)	-1.317*** (-7.78)
Year dummy	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes
Adjusted R^2	0.226	0.071	0.075	0.056
N of observations	10,535	10,565	10,565	10,532

This table presents the results from instrumental variables regressions. Column 1 reports the first-stage results of the two stage least square (2SLS) regressions with Cultural diversity as the dependent variable. The instrument is the genetic diversity and calculated as an entropy measure: $Genetic\ Diversity_{it} = \sum_{j=1}^J Genetic\ Distance_{US,j} * N_{ijt} \ln(1/N_{ijt})$. The genetic distance data is from Spolaore and Wacziarg (2016). Columns 2 and 3 report the second-stage results from 2SLS regressions for Tobin's Q, market capital to total assets (MC/TA) and enterprise value to total assets (EV/TA), respectively. All variables are detailed in Appendix: Variable Description. In parentheses, we report t-statistics. Standard errors are White-corrected. The sample covers the period 2004-2013. ***, ** and * indicates significance at the 1%, 5% and 10% levels, respectively.

On the other hand, a higher degree of foreign operations may increase the liability of foreignness, which refers to the disadvantage that firms encounter when operating in countries outside their home country (Zaheer 1995; Denk *et al.* 2012). According to Zaheer (1995), the liability of foreignness gives rise to four costs: costs caused by transportation and coordination, costs due to unfamiliarity, costs resulting from host country legitimacy, and costs because of home country regulation. These extra costs imply that a higher degree of foreign operation would reduce firm value. Christophe (1997) provides empirical evidence of this implication. What is more, the above definition suggests that cultural differences can be a source of the liability of foreignness (Calhoun 2002; Mezias *et al.* 2002). Therefore, if cultural diversity is at least as important as the other costs of going international, then we would expect that the effect of cultural diversity to remain significant after controlling for the degree of foreign operations.

To examine whether the degree of foreign operations affects the negative relation between cultural diversity and firm value, we introduce the commonly used measure of a firm's foreign operations: foreign assets to total assets (FATA) (Sullivan 1994, 1996). Holding many foreign assets can be an indicator that a firm is strongly involved in foreign operations. In Panel A of Table 4-7, we test the effect of foreign operations by splitting the sample according to the mean of FATA,²⁰ and use cultural diversity measured by five alternative cultural frameworks (dimensions) to make sure of the robustness of our findings. The results show that, no matter whether the level of foreign operations is high or low, cultural diversity negatively affects firm value. This negative effect is significant in nine out of ten regressions. Therefore, these results do not provide evidence that a higher degree of foreign operations mitigates the negative effect of cultural diversity.

One limitation of subsample analysis is that it does not capture the relation between cultural diversity and the degree of foreign operations. Given the nature of global

²⁰ Similar results are obtained when we split the sample by the median of FATA.

diversification, one criticism is that cultural diversity may just be a proxy for the degree of foreign operations. Specifically, it is likely that firms with a lower level of foreign operations have a lower cultural diversity, whereas firms with a higher level of foreign operations have a higher cultural diversity. To address this concern, panel B of Table 4-7 controls for the degree of foreign operations. The results show that the coefficients of cultural diversity remain significantly negative. These results confirm the findings in Panel A and suggest that the negative valuation effect of cultural diversity is not driven by the degree of foreign operations. In addition, the results show that FATA has negative coefficients throughout five regressions, suggesting that a higher degree of foreign operations has a negative effect on firm value. This result is in line with the argument about the liability of foreignness (Zaheer 1995; Denk *et al.* 2012). In short, while cultural diversity may be a source of the liability of foreignness, the negative valuation effect of cultural diversity is distinctive.

Overall, the findings in this section suggest that increasing foreign operations does not mitigate the negative valuation effect of cultural diversity and are inconsistent with the argument that cultural diversity is a proxy for the degree of foreign operations. These results also provide significant evidence that cultural diversity plays an independent role to other costs of the foreignness liability.

4.4.3.2 Cultural diversity and the development level of host countries

One important country characteristic that can affect the relation between cultural diversity and firm value is the level of development of foreign countries. Pantzalis (2001) finds that multinational firms with a presence in developing economies have higher market values than multinational firms operating only in countries with advanced economies. He argues that this is because operating in developing countries is more likely to exploit market imperfections and drive internationalization advantage. On the other hand, Morck and Yeung (1991) find that the value of a multinational firm derives

Table 4-7: The effects of foreign operations on the cultural diversity and firm value relation

Dependent variable	Tobin's Q									
Panel A: Subsample analysis										
	Low FATA	High FATA	Low FATA	High FATA	Low FATA	High FATA	Low FATA	High FATA	Low FATA	High FATA
CD_Hofstede	-0.09** (-2.25)	-0.18*** (-5.66)								
CD_GLOBE			-0.08** (-2.23)	-0.15*** (-4.82)						
CD_Egalitarianism					-0.39*** (-3.45)	-0.36*** (-4.03)				
CD_Trust							-0.13* (-1.65)	-0.22*** (-3.04)		
CD_Individualism									-0.31*** (-3.35)	-0.07 (-0.92)
Constant	-1.62*** (-7.44)	-0.56** (-2.16)	-1.51*** (-6.88)	-0.52** (-1.99)	-1.64*** (-7.47)	-0.56** (-2.12)	-1.60*** (-7.30)	-0.58** (-2.21)	-1.65*** (-7.58)	-0.51* (-1.95)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.24	0.22	0.25	0.21	0.25	0.21	0.25	0.21	0.24	0.21
Number of observations	5,340	5,241	5,325	5,210	5,322	5,203	5,322	5,203	5,326	5,214
Panel B: The effect of foreign operations on the relation between cultural diversity and firm value										
CD_Hofstede	-0.11*** (-4.20)									
CD_GLOBE			-0.09*** (-3.67)							
CD_Egalitarianism					-0.34*** (-4.36)					
CD_Trust							-0.16*** (-2.75)			
CD_Individualism									-0.14** (-2.21)	
FATA	-0.59*** (-10.52)		-0.60*** (-10.64)		-0.57*** (-10.05)		-0.58*** (-10.27)		-0.58*** (-10.34)	
Constant	-1.31*** (-7.91)		-1.21*** (-7.24)		-1.32*** (-7.92)		-1.31*** (-7.92)		-1.31*** (-7.96)	
Control variables	Yes		Yes		Yes		Yes		Yes	
Year dummy	Yes		Yes		Yes		Yes		Yes	
Industry dummy	Yes		Yes		Yes		Yes		Yes	
Adjusted R^2	0.23		0.23		0.23		0.23		0.23	
Number of observations	8,613		8,588		8,584		8,584		8,592	

This table presents the results from ordinary least square regressions for the effect of foreign operations on the relation between cultural diversity and firm value. The degree of foreign operations is measured by the proportion of foreign assets to total assets (FATA). The dependent variable is firm value as measured by Tobin's Q. All variables are detailed in Appendix: Variable Description. Standard errors are White-corrected. The sample covers the period 2004-2013. ***, ** and * indicates significance at the 1%, 5% and 10% levels, respectively.

from a presence in other developed economies because operating in developed countries facilitates and enhances the use a firm's intangible assets. Further, Alfaro *et al.* (2004) provide evidence that well-developed local financial markets benefit both the growth of local economies and the value of foreign multinational firms. In addition, Wells (1998) suggests that operating in developing countries brings various challenges, such as currency instability, exchange controls, rules on collateral, and the peculiar tax institutions. These challenges could negatively affect firm value. To investigate whether the level of foreign country development influences the valuation effect of cultural diversity, we control for the proportion of subsidiaries operating in advanced economies as defined by the International Monetary Fund.

In Panel A of Table 4-8, we report the results of the five alternative cultural diversity measures. The coefficients on advanced economies are significant and positive in all five regressions, suggesting that a higher degree of operations in advanced economies leads to a positive effect on firm value. Thus, these findings support Morck and Yeung (1991), Wells (1998) and Alfaro *et al.* (2004). However, the inclusion of advanced economies variable does not affect the consistency and significance of the negative effect of cultural diversity on firm value. In sum, there is no evidence that the valuation effect of cultural diversity is driven by the development level of host countries.

4.4.3.3 Cultural diversity and the creditor rights of foreign countries

Prior culture and finance study distinguishes the effect of culture from that of formal institutional factors (Siegel *et al.* 2011; Shao *et al.* 2013). Among formal institutional factors, creditor rights play a particularly important role. For example, Stulz and Williamson (2003) document that culture results in differences in the protection of creditor rights across countries. Gande *et al.* (2009) argue that countries with strong creditor rights provide firms with better channels to obtain funding in the local markets

Table 4-8: The effect of host country characteristics on the cultural diversity and firm value relation

Dependent variable	Tobin's Q				
Panel A: The effect of operating in developed countries					
CD_ Hofstede	-0.14*** (-5.49)				
CD_GLOBE		-0.10*** (-4.16)			
CD_ Egalitarianism			-0.49*** (-6.59)		
CD_ Trust				-0.12** (-2.19)	
CD_ Individualism					-0.26*** (-4.10)
Advanced economies	0.78*** (5.71)	1.01*** (7.06)	0.73*** (5.10)	0.90*** (6.28)	0.73*** (5.35)
Constant	-1.03*** (-5.57)	-0.97*** (-5.23)	-1.06*** (-5.69)	-1.06*** (-5.67)	-1.03*** (-5.54)
Control variables	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.228	0.230	0.226	0.227	0.227
Number of observations	10,581	10,581	10,581	10,581	10,581
Panel B: The effect of creditor rights					
CD_ Hofstede	-0.13*** (-5.11)				
CD_GLOBE		-0.11*** (-4.38)			
CD_ Egalitarianism			-0.39*** (-5.47)		
CD_ Trust				-0.15*** (-2.69)	
CD_ Individualism					-0.22*** (-3.56)
Creditor rights	0.87*** (3.58)	0.99*** (4.14)	0.87*** (3.45)	1.04*** (4.27)	0.91*** (3.74)
Constant	-1.36*** (-6.85)	-1.37*** (-6.89)	-1.36*** (-6.85)	-1.40*** (-6.94)	-1.45*** (-7.26)
Control variables	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.228	0.227	0.228	0.226	0.226
Number of observations	10,442	10,442	10,442	10,442	10,442
Panel C: The effect of corruption					
CD_ Hofstede	-0.13*** (-5.13)				
CD_GLOBE		-0.10*** (-3.96)			
CD_ Egalitarianism			-0.40*** (-5.56)		
CD_ Trust				-0.16*** (-2.86)	
CD_ Individualism					-0.22*** (-3.58)
Corruption	-0.44** (2.04)	-0.39* (1.72)	-0.70*** (3.29)	-0.50** (2.24)	-0.75*** (3.41)
Constant	-0.98*** (-4.98)	-0.99*** (-5.03)	-0.89*** (-4.45)	-1.01*** (-5.10)	-0.95*** (-4.79)
Control variables	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.226	0.225	0.227	0.225	0.225
Number of observations	10,442	10,442	10,442	10,442	10,442

This table presents the results from ordinary least square regressions for the effect of country development on the relation between cultural diversity and firm value. All variables are detailed in Appendix: Variable Description. In parentheses, we report t-statistics. Standard errors are White-corrected. The sample covers the period 2004-2013. ***, ** and * indicates significance at the 1%, 5% and 10% levels, respectively.

to support growth opportunities. In line with this argument, Gande, Schenzler, and Senbet (2009) find a valuation enhancement for multinational firms diversifying into countries with strong creditor rights. The evidence that valuation benefits from stronger creditor rights is also found in studies of U.S. domestic market. For example, Nini *et al.* (2009) find that strong creditor rights facilitate restrictions on capital expenditure, which subsequently promote firm market value and operating performance. Therefore, one concern regarding our previous findings would be that strong creditor rights in local markets offset the negative effect of cultural diversity on firm value. If this is the case, we would expect an insignificant coefficient on cultural diversity after controlling for creditor rights.

To address this concern, we introduce a variable to control for the effect of creditor rights. Specifically, for each firm, we calculate the weighted average of the creditor rights variable across all countries where the firm has subsidiaries, the weights being the number of subsidiaries in that country as a fraction of the firm's total number of subsidiaries. The creditor rights data are from La Porta *et al.* (1997, 1998) and Djankov *et al.* (2007).²¹ The results, reported in Panel B of Table 4-8, show that credit rights are positively related to firm value. These results are in line with Gande *et al.* (2009), suggesting that operating in countries that provide multinational firms with a better protection for their borrowings facilitates value enhancement. More importantly, the negative effect of cultural diversity on firm value remains negative and significant after introducing credit rights. These results suggest that the valuation effect of cultural diversity within a firm is not offset by and does not proxy for formal institutional factors. Thus, cultural diversity plays an independent and important role in influencing the value of multinational firms.

²¹ In these studies, the creditor rights are scaled between 0 and 4, with a higher value indicating stronger creditor rights. We average scores over years for each country and standardized scores to be bounded between zero and one as a final measure of creditor rights.

4.4.3.4 Cultural diversity and foreign corruption

Another important country characteristic that may affect the relation between cultural diversity and firm value is corruption. Zeume (2017) finds that the passage of anti-bribery law results in a reduction in the value of firms that have subsidiaries in high-corruption countries. Further, the degree of corruption can be related to culture. Husted (1999) reports that corruption is positively related to cultural dimensions such as power distance, masculinity, and uncertainty avoidance. Khatri *et al.* (2006) and Zheng *et al.* (2013) indicate that corruption is more likely occur in collectivist cultures. Therefore, if the effects of cultural diversity seen so far are shaped by the level of corruption in foreign countries, a reduction in the significance of the coefficient on cultural diversity would be expected when we control for corruption.

To test whether this is the case, we use a measure of foreign government corruption compiled by the Transparency International Corruption Perceptions Index, which is well-accepted in finance literature as a measure of corruption (DeBacker *et al.* 2015; Liu 2016). We calculate the weighted average corruption score for each multinational firm,²² the weight is the ratio of the number subsidiaries in a country divided by the total number of subsidiaries. Panel C of Table 4-8 shows the results. Again, we use cultural diversity measured by five frameworks or dimensions to ensure robustness. Consistent with expectations, all regressions produce negative coefficients on corruption, suggesting that there is a valuation destroy in the expansion of subsidiaries into perceptively corrupt countries. However, the negative coefficients on cultural diversity suggest that the effect of cultural diversity on firm value is not influenced by foreign government corruption. Overall, these results confirm that cultural diversity has a distinct effect on firm value.

²² For each country, we calculate a ten-year average score and standardized the score to be bounded between zero and one. Because countries with a higher degree of corruption are assigned lower scores by Transparency International, we use one minus the scores obtained above for the final estimation of corruption.

4.5 Conclusion

In Chapter 4, we examine the impact of cultural diversity on the value of multinational firms. We find strong evidence that there is a negative relation between cultural diversity and firm value. This negative relation holds after controlling for firm-level determinants and country-level economic agreements and treaties. Further, the negative valuation effect of cultural diversity does not materially change controlling for macroeconomic risks. Finally, the negative valuation effect of cultural diversity becomes stronger when we control for shared language, shared law and colonial relations between host countries and the United States, indicating that the effect of cultural diversity is distinctive and not a proxy for these country-level similarities.

We show that the results are robust to alternative culture and valuation measures. We also find the negative effect of cultural diversity on firm value are robust over time, suggesting the results is not driven by the business cycle. Further, we demonstrate that our results are not driven by endogeneity, suggesting that there is a causal relation between cultural diversity and firm value.

The results of this chapter support the idea that global diversification gives rise to frictions that negatively affect the value of multinational firms. We extend this idea by showing that this valuation effect is associated with cultural diversity within a multinational firm. It is expected that U.S. firms would keep adopting the global diversification strategy, as the improvement in transportation and technology made it less costly U.S. firms to do business overseas and easier to expand operations in culturally diversified markets (Dumas & Uppal 2001). In this case, understanding the effect of cultural diversity on firm value is one of the key aspects of understanding global diversification.

Chapter 5

Cultural Diversity and Capital Structure

5.1 Introduction

The extant literature shows that the capital structures of multinational firms are distinctive. One strand of studies finds that multinationals have lower leverage ratios than purely domestic companies (Lee & Kwok 1988; Burgman 1996; Park *et al.* 2013). Another strand of studies reports that, among multinational firms, leverage ratios decrease as the degree of foreign operations increases (Doukas & Pantzalis 2003; Mittoo & Zhang 2008).²³ The main argument of these studies is that multinational firms face higher agency costs as an increased involvement in global markets makes it difficult for investors to monitor the operations of multinational firms. This would make it more costly for multinational firms to obtain external financing therefore reducing leverage.

While these studies consistently find that multinational firms have low leverage ratios, it seems that their arguments contradict Myers (1977), who suggests that higher agency costs should be associated with higher debt levels. As argued by Jensen (1986), debt reduces the amount of free cash flow available to managers and therefore restricts the possibility of overinvestment, consuming perquisites, and empire building. Berger *et al.* (1997) and Friend and Lang (1988) argue that a higher amount of debt increases the probability of bankruptcy, stimulates managers to work harder and therefore facilitates aligning the benefits of managers and shareholders. Harvey *et al.* (2004) report that firms

²³ Mittoo and Zhang (2008) find that U.S. multinational firms display lower leverage than Canadian multinational firms. They argue that U.S. multinational firms operate in a widely global environment, whereas Canadian multinational firms concentrate their foreign operations in the United States. Therefore, their differences in capital structures can be attributed to the difference in agency costs of firms related to their international distributions.

with high agency costs may prefer to be more leveraged, as some of the risks can be shared by debt-holders.

The above inconsistency raises an interesting question about what causes the low leverage ratios of multinational firms. In this chapter, we investigate this issue by focusing on cultural diversity within a firm, which is closely associated with agency problems as discussed in Chapter 2. Cultural diversity is an inherent characteristic of multinational firms and an inevitable result when the firm establishes subsidiaries in various foreign countries, where the management practices and organizational control systems are unlikely to be the same. Consequently, cultural diversity could influence a firm's financial strategies and practices, bringing new challenges to multinational firms. (Gómez-Mejia & Palich 1997; Palich & Gomez-Mejia 1999). These increased challenges can be reflected in two ways regarding agency problems and capital structure decisions. First, cultural diversity intensifies monitoring costs between multinational firms and their shareholders. It would become more difficult for shareholders to monitor firm operations in a number of different countries, especially in cases where those countries are culturally distant from the home territory (Nohria & Ghoshal 1994). Further, cultural diversity would create obstacles for investors accurately evaluating the operations of multinational firms. Aabo *et al.* (2015) suggest that operating in a large number of culturally different settings worsens the information environment of the multinational firm as a whole, making it more opaque for investors to assess multinational firms' operations. The evidence in these studies suggests that cultural diversity exasperates principal-agent issues, which could be the main cause of the lower leverage ratios of multinational firms as suggested by the existing literature.

In this chapter, we provide empirical examination of the effect of cultural diversity within multinational firms on their capital structures. Our proxy for cultural diversity is an entropy measure as constructed in Chapter 3. To examine how capital structures of

multinational firms are impacted by cultural diversity, we start by focusing on leverage ratios. Our results show that an increase in cultural diversity leads to a decrease in both book and market leverage ratios. These results hold after controlling for conventional firm-level determinants, including firm size, asset tangibility, growth opportunity, and profitability. Our findings suggest that cultural diversity has a direct impact on firms' capital structures, apart from affecting capital structures indirectly through firm-level characteristics. The results remain after further controlling for country-level characters, including common religion, language, and law and geographical distance. Further, the negative effect of cultural diversity is not driven by macroeconomic variables, which include economic growth, exchange rate, and inflation volatilities. These results provide an important implication that when evaluating capital structures of multinational firms, it is important to take into account frictions caused by cultural differences.

A decrease in leverage ratios can be the consequence of two decisions: an increase in equity or a reduction in debt. We investigate how cultural diversity can play a role in each of these decisions affecting the leverage ratios of multinational firms. The result shows that cultural diversity is positively related to net equity issuance and not related to net debt issuance. Strikingly, we also find evidence that cultural diversity is negatively associated with debt retirement in the subsequent period, suggesting that the higher the cultural diversity, the lower the likelihood that multinational firms would reduce debt in the following period. This sharply contradicts previous arguments in multinational capital structure studies that argue that the low leverage ratios of multinational firms are caused by debt reduction. Nevertheless, the findings of this chapter are in line with the argument that a higher agency cost is associated with a higher debt level (Myers 1977) and that complex firms tend to issue equity (Myers 2000; Vijn 2006). In addition, we do not find evidence that cultural diversity leads to simultaneous equity issuance and debt reduction. These results illustrate that the negative relation between cultural diversity and the

leverage ratios of multinational firms is mainly driven by equity issuance.

This chapter contributes to the literature in the following ways. First, it contributes to studies on culture and finance, in particular, studies on culture and capital structure. While extensive cross-country research has shown that national culture plays an important role determining capital structures, this is the first study to investigate the effect of cultural exposures within firms on capital structure decisions. Stulz and Williamson (2003) find that national cultures are critical when explaining the effectiveness of creditor rights protection across countries. Sekely and Collins (1988), Chui *et al.* (2002) and Zheng *et al.* (2012) find that differences in national cultures lead to cross-country differences in capital structures after consideration of the formal institution (such as law and regulation) and firm-level determinants of capital structures. The papers above suggest that national culture has a fundamental influence on personal value, formal institutions, and the preference of resource allocation, and therefore has strong explanatory power for a variation in firm financing across countries. In this chapter, we take a further step to show that potential cultural conflicts within a firm can also significantly influence its capital structure decisions.

Second, this chapter contributes to studies on the capital structure of multinational firms. Desai *et al.* (2004) and Huizinga *et al.* (2008) focus on subsidiary leverage, finding that the difference in tax rates motivates firms to shift debt to high-tax countries. Different from the above studies, this chapter investigates how firm-level capital structures can be affected by country exposures. In this sense, this chapter is most closely related to Desai *et al.* (2008) who focus on the aggregated political risks (formal institutions) of multinational firms, finding that the higher the political risk, the lower the leverage ratio of a firm. By contrast, we focus on the cultural diversity (informal institutions) of multinational firms. Therefore, the result of this chapter provides an important complement to Desai *et al.* (2008), suggesting that, in addition to the formal institution,

informal factors should also be taken into account when evaluating the capital structures of multinational firms.

Finally, our findings contribute to studies concerning equity issuance. The survey results of Graham and Harvey (2001) suggest that that agency costs are the most important considerations for equity issuance. An increase in cultural diversity aggravates information asymmetry and provides opportunities for managerial entrenchment (Aabo *et al.* 2015). This may stimulate multinational firms to hoard cash by issuing equity. Further, Myers (2000) reports that firm complexity is the principal reason for firms to issue equity. Vijn (2006) shows that parent-subsidiary structured firms are more likely to issue equity. Cultural diversity increases firm complexity as multinational firms are not only established through parent-subsidiary structures but also have to organize their foreign subsidiaries according to local cultures (Rosenzweig & Singh 1991). This may increase the tendency for multinational firms to issue equity.

The remainder of this chapter is organized as follows. In the next section, we present the theoretical framework and develop hypotheses. In Section 5.3, we describe data and variables. In Section 5.4, we report the results of empirical tests. We conclude this chapter in Section 5.5.

5.2 Literature and hypotheses

As briefed discussed in Chapter 2, cultural diversity can affect the capital structure of multinational firms through several channels. In this section, we provide detailed theoretical arguments on the effect of cultural diversity on capital structures of multinational firms and develop hypotheses for leverage ratios and debt-equity choices.

5.2.1 Cultural diversity and leverage ratios

The existing literature documents that the leverage ratios of multinational firms are

affected by agency problems (Doukas & Pantzalis 2003), information asymmetry (Burgman 1996), and the riskiness of foreign investments (Desai *et al.* 2008). Cultural diversity is closely associated with these factors. First, cultural diversity intensifies agency problems, which is considered to be the main cause of lower leverage ratios of multinational firms in existing studies (Lee & Kwok 1988; Doukas & Pantzalis 2003). Since information delivery is different from one culture to another (Sperber & Hirschfeld 2004), cultural diversity makes monitoring more difficult and expensive. It may be likely that very large investors hire an audit firm who has offices or contracts with local audit firms in these markets. However, this approach would inevitably incur auditing fees and make monitoring more costly (Eichenseher 1985). Further, one of the primary motivations for a firm to expand to culturally distant markets is to integrate its firm-specific advantages, often in the form of intangible assets, with local resources (Hart 1995). However, when cultural diversity is high, the integration process is likely to be more difficult and expensive. This could impede investors from accurately evaluating the potential synergies of overseas expansions. In addition, a well-functioning international capital market can provide arbitrage opportunities that may reduce agency costs (Hodder & Senbet 1990). Nonetheless, cultural differences may render investors reluctant to participate in foreign financial markets and therefore create barriers for investors to take advantage of those market mechanisms to reduce agency costs.

Second, cultural diversity aggravates information asymmetry, which is the main factor influencing capital structures according to the pecking-order theory (Bharath *et al.* 2009). It could be argued that cultural diversity is associated with severe information frictions, therefore making it difficult for investors to collect and analyze financial information on the subsidiaries located in culturally distant markets (Shroff *et al.* 2014; Aabo *et al.* 2015). In the finance literature, Huang (2015) shows, through direct evidence, cultural difference makes it more difficult for investors to understand value-relevant

foreign information. Specifically, the author reports that shareholders of multinational firms respond slowly to information from culturally distant markets, indicating that cultural diversity obstructs information transmission between multinational firms and investors. Therefore, it can be expected that the more cultures that a firm involves, the more serious the informational asymmetry that the firm encounters.

Finally, cultural diversity affects the perception of the riskiness of foreign investments, which is found to have a negative effect on the leverage ratios of multinational firms (Desai *et al.* 2008). The uncertainties of operating in countries with greater cultural distances can be based on unfamiliarity because of the greater the cultural differences, the lower the knowledge about local markets (Cao *et al.* 2011). The effects of these uncertainties can be so significant to result in firms preferring to make direct foreign investments in cultures that are similar to the home country (Davidson 1980) as well as carefully choosing an entry mode for culturally distant markets (Kogut & Singh 1988; Shane 1994; Barkema *et al.* 1996; López-Duarte & Vidal-Suárez 2010). Uncertainty regarding the estimation of future foreign cash flow also increases with cultural diversity, as there are cross-cultural differences in voluntary annual report disclosures (Meek *et al.* 1995). Further, the unfamiliarity of different cultures and cross-cultural differences in financial practices would reduce the effectiveness of multinational firms' hedge strategies (Kerkvliet & Moffett 1991; Chowdhry & Howe 1999; Lievenbrück & Schmid 2014) and subsequently make foreign risk management more difficult. Therefore, we expect that the foreign investment risk associated with cultural diversity would lower the leverage ratios of multinationals.

5.2.2 Cultural diversity and debt-equity choices

Cultural diversity is related to the complexity of the contracting environment and affects financial decisions on the debt-equity choices of multinational firms. Modern corporate finance views a firm as a “nexus of contracts” and a firm's financing choices

reflect the contracting efficiency of the firm (Aghion & Bolton 1992). However, due to the bounded rationality of human actors, it is impossible for all relevant contingencies to be completely contracted. Under incomplete contracting, the choice of financing resources is influenced by the complexity of the contracting environment, which includes not only the formal institutional environment but also the informal institutional environment or culture (Williamson 1998). Culture is a more foundational factor as it represents a system of values and beliefs that underlie formal institutions (Williamson 2000). Therefore, multinational capital structure decisions on the choice of different financing resources (debt or equity) would eventually be influenced by cultural diversity.

5.2.2.1 Cultural diversity and debt decisions

Earlier studies suggest that global diversification increases agency costs of debt, which makes it more difficult for debt-holders to actively monitor multinational firms, leading to a reduced use of debt (Lee & Kwok 1988; Burgman 1996; Doukas & Pantzalis 2003; Mittoo & Zhang 2008; Park *et al.* 2013). Cultural differences can be one of the main causes of increased agency costs of debt. For instance, Burgman (1996) and Mittoo and Zhang (2008) suggest that language differences increase information gaps, leading to higher costs for debtholders to monitor the foreign operations of multinational firms. The phenomenon of informational obscurity associated with multinational operations leading to a lower leverage ratio has been documented in Doukas and Pantzalis (2003) who argue that higher information asymmetries make it costly for multinational firms raising funds from external markets. Consequently, multinational firms tend to rely more on their internal capital markets and have a lower leverage ratio. In addition, from the private lenders' perspective, Mian (2006) suggests that an increased cultural distance is negatively associated with the supply of bank loan.

5.2.2.2 Cultural diversity and the equity decision

Cultural diversity increases firm complexity and, according to Myers (2000), when a firm becomes more complex, the firm is more likely to issue equity. There are two reasons. First, firm complexity increases the monitoring costs of equity investors. Thus, self-interested managers can issue equity to reduce the bargaining power of outside shareholders. Second, monitoring costs can be even higher when issuing equity increases the dispersion of the shareholder base, which exacerbates the difficulty of shareholders to monitor managers. This increased monitoring cost provides managers with more chances for the discretionary uses of free cash flow. Therefore, Myers (2000) argues that it is monitoring associated with firm complexity that causes outside equity issuance, rather than the other way round. Further, Myers (2000) claims that formal institutions such as laws and regulation may alleviate agency problems between managers and outside shareholders to a certain extent; however, the complexity of modern firms is the underlying principles of equity issuing.

Given the fact that cultural diversity in our study is associated with the parent-subsidary structure of multinational firms, the tendency for multinationals to issue equity may increase. Vijh (2006) investigates the equity issuance decisions of parent-subsidary structured firms and finds that these firms tend to issue equity to exploit the overvaluation associated with parent-subsidary structures, rather than enhancing finance flexibility. This finding is in line with Myers (2000), suggesting that parent-subsidary structured firms are complex and more likely to issue stock when managers have private information that outside shareholders do not have. Firms can become even more complex when they establish subsidiaries in various countries with different cultures. In this case, the firm complexity associated with cultural diversity may impede shareholders to evaluate firms' operations accurately. Therefore, cultural diversity can increase agency costs by inhibiting the shareholders' ability to share the benefits they deserve. This may lead to managers of multinational firms having a stronger incentive to issue equity.

5.3 Sample and variables

In this section, we describe the sample distribution and variable construction for capital structure and control variables.

5.3.1 Sample

The detailed data selection process is described in Chapter 3. This chapter excludes firms that do not have information regarding capital structures and focuses on firms that diversify their business in at least two foreign countries to address endogeneity concerns.²⁴ The final sample contains 2,367 parent firms with 165,645 subsidiaries, providing 11,562 parent-level firm-year observations.

Table 5-1 reports the sample distribution. It shows that the property of data closely mimics the whole sample described in Chapter 3. In particular, the first row of Table 5-1 shows that the number of sample firms steadily increases from 2004 to 2013. The second row of Table 5-1 shows that the number of subsidiaries of sample firms also increases gradually from 29,726 to 62,727. On a ten-year average, 52.78% of the sample firm subsidiaries are incorporated in foreign countries. Throughout the sample period, the number of foreign subsidiaries increases from 17,170 to 33,346, and the number of nations that the sample covers increases from 147 to 174, suggesting that there is an increase in the number of firms operating overseas and therefore in cultural diversity during this period.

Panel A of Table 5-2 shows the summary statistics for cultural diversity. The mean (median) value of cultural diversity measured by the Hofstede framework is 3.03 (2.26) with the maximum value of 9.53. The mean value of cultural diversity regarding the GLOBE framework, egalitarianism, individualism, and trust are 2.93, 0.91, 0.67, and 0.83,

²⁴ See Endogeneity concern in the Results section of this chapter.

Table 5-1: Sample distribution for capital structure data

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Dist. count	Obser.
# Parent firm	880	998	1,064	1,134	1,195	1,227	1,191	1,185	1,354	1,334	2,367	11,562
# Subsidiary	29,726	40,675	38,745	45,893	51,037	51,412	50,918	52,495	61,437	62,727	165,645	514,425
% Foreign subsidiary	57.76%	55.10%	52.59%	51.82%	52.52%	52.55%	54.51%	54.49%	52.90%	53.16%	--	52.78%
% Domestic subsidiary	42.24%	44.90%	47.41%	48.18%	47.48%	47.45%	45.49%	45.51%	47.10%	46.84%	--	47.22%
# Nation	147	157	161	170	169	164	167	167	175	174	190	1,655

This table reports the number or percentage of a sample of U.S. listed companies, their subsidiaries, and nations where subsidiaries are incorporated throughout the period from 2004 to 2013. “# Parent firm”, “#Subsidiary” and “#Nation” are the number of firms, subsidiaries, and nations. “% *Foreign subsidiary*” reports the proportion of foreign subsidiaries to the total number of subsidiaries and “% *Domestic subsidiary*” reports the proportion of domestic subsidiaries to the total number of subsidiaries. “Dist. count” reports the number of distinct firms, subsidiaries and nations from 2004 to 2013. “Obser.” reports the total number (percentage) of observations over the ten-year period 2004-2013. According to Orbis, two unincorporated U.S. territories: Puerto Rico and U.S Virgin Islands are separately reported. The other two unincorporated U.S. territories: Guam and Northern Mariana Islands are not reported.

respectively.²⁵

5.3.2 Measures of capital structure

We use two ways to measure capital structure. First, we use leverage ratios that are computed as the sum of short- and long-term debts to total capital. This measure of capital structure is consistent with Welch (2011), who suggests that using total capital instead of total assets is more appropriate to estimate leverage ratios. To ensure the robustness of the results, we use both book and market leverage ratios (Rajan & Zingales 1995). The book leverage ratio is calculated as the sum of short- and long-term debts divided by total capital, and the market leverage ratio is calculated as the sum of short- and long-term debts divided by book value of total debt plus the market value of equity. Financial data for leverage ratios are obtained from the Thomson Reuters Datastream.

The second way to examine the capital structure is to investigate debt and equity activities. To do so, we first investigate how cultural diversity affects the debt-equity choice by introducing dummy variables for equity and debt decisions, respectively. We then examine the net issuance of debt and equity. Following Hovakimian *et al.* (2001) and Frank and Goyal (2003), we define net debt issuance as the proceeds from long-term debt issuance minus the amount of long-term debt reduction plus changes in short-term debt. We define net equity issuance as proceeds from the sales of common and preferred equity minus retirements, redemption, and repurchases of common and preferred equity. In line with, Hovakimian *et al.* (2001) and Frank and Goyal (2003), both net debt issuance and net equity issuance are scaled by total assets. The data for net equity and debt issuance are obtained from Worldscope.

²⁵ The data also reveal that the mean values of cultural diversity increase from 2004 to 2013 and that firm-year observations are mainly from the manufacturing and service industry.

Table 5-2: Summary statistics for cultural diversity, capital structure and controls

	Observations	Mean	St.dev.	Minimum	Median	Maximum
Panel A: Cultural diversity						
Hofstede cultural diversity	11,526	3.03	2.57	0.01	2.26	9.53
GLOBE cultural diversity	11,484	2.93	2.41	0.01	2.22	8.84
Egalitarian cultural diversity	11,472	0.91	0.70	0.001	0.70	2.49
Individualistic cultural diversity	11,462	0.67	0.57	0.001	0.53	2.13
Trust cultural diversity	11,462	0.83	0.73	0.002	0.63	2.83
Panel B: Capital structure						
Book debt ratio (%)	19,522	29.18	33.03	0.00	22.08	187.20
Market debt ratio (%)	18,620	18.25	22.80	0.00	10.69	118.12
Panel C: Control variables						
Growth opportunity	19,734	0.88	0.82	-1.19	0.83	3.49
Tangibility (%)	21,778	21.25	20.34	0.34	14.21	87.78
Firm size	21,907	13.23	1.99	8.72	13.21	18.01
Profitability (%)	21,899	2.74	20.73	-102.75	7.13	36.74
Shared religion (%)	16,692	15.26	21.23	0.00	9.09	100.00
Shared language (%)	16,692	20.35	22.88	0.00	14.29	100.00
Shared law (5)	16,692	24.62	23.82	0.00	20.00	100.00
Geographical distance	16,730	0.10	0.22	0.00	0.02	1.38
Economic growth rate volatility	15,522	1.35	1.22	0.00	1.03	12.16
Exchange rate volatility	15,584	4.69	4.16	0.00	4.27	144.89
Inflation volatility	15,512	2.25	49.97	0.00	0.82	3384.70

This table reports descriptive statistics for variables of 3,326 firms from 2004 to 2013. “St.dev.” represents standard deviations of variables. All variables are detailed in Appendix: Variable Description. Data are winsorised at the 1% of the both sides of data distribution.

Panel B of Table 5-2 reports summary statistics for the measures of capital structure. The means (medians) of book and market leverage ratios are 29.18% (22.08%) and 18.25% (10.69%), respectively. The means (medians) of net debt and equity issuance are 0.60 (0.00) and -0.06 (0.01), respectively. The data indicate that, on average, the proceeds of debt issuance are slightly higher than the amount of debt reduction and those values of equity issuances and reductions are more or less the same. Further, the average of the net proceeds of equity issuance is higher than that of the debt issuance. In addition, the net proceeds of equity issuance are more volatile than that of the debt issuance as suggested by their standard deviations of 9.91 and 8.07, respectively.

5.3.3 Determinants of capital structure

To investigate the effect of cultural diversity on multinational capital structure, we control for firm-level determinants, country-level factors, and macroeconomic risks. Firm-level determinants include firm size, profitability, tangibility, and growth opportunity (Rajan & Zingales 1995). Country-level factors include geographical distance and shared religion, language and law (Siegel *et al.* 2011; Ahern *et al.* 2015; Karolyi 2016). Finally, Desai *et al.* (2008) argue that macroeconomic volatilities also reflect the riskiness of foreign investments and therefore influence the leverage decisions of multinational firms. Similar to Desai *et al.* (2008), three measures of macroeconomic risks considered in our study are economic growth volatility, exchange rate volatility, and inflation volatility, measured by standard deviations of the GDP growth rate, the real exchange rate and the real consumer price index (CPI), respectively. Summary statistics for control variables are reported in Panel C of Table 5-2. All the variables above are described in Appendix.

5.4 Results

In this section, we present our results for the effects of cultural diversity on multinational capital structures. We first report the results on the relation between cultural diversity and leverage ratios, and then show our findings on the relation between cultural diversity and debt-equity choice.

5.4.1 Cultural diversity and leverage ratios

5.4.1.1 Conventional leverage regressions

We evaluate the effect of cultural diversity on leverage ratios in the context of a standard leverage ratio regression as follows:²⁶

$$\text{Leverage ratios}_{i,t} = \beta_0 + \beta_1 \cdot \text{Cultural Diversity}_{i,t-1} + \beta_2 \cdot f(Z_{t-1}) + \varepsilon_{i,t} \quad (5A)$$

where $\text{Leverage ratios}_{i,t}$ is the book or market leverage ratio of firm i at year t . $\text{Cultural Diversity}_{i,t-1}$ is the entropy measure of cultural diversity of firm i at year $t-1$. $f(Z)$ corresponds to a vector of the control variables that may affect the relation between cultural diversity and leverage ratios as discussed in the previous section.

The estimation results are shown in Table 5-3, where Panel A reports results using book leverage ratio as the dependent variable and Panel B reports results using market leverage ratio as the dependent variable. Column 1 of Table 5-3 presents the baseline result for which only conventional firm-level determinants of capital structures are controlled. In Panel A, the result shown in Column 1 suggests that cultural diversity has a negative impact on the book leverage ratio, and this negative effect is highly significant. Moreover, this effect is causal, as indicated by specification (5A) in where we use the

²⁶ Earlier studies about the institutional determinants of capital structure argue that institutional factors impede the adjustment of leverage ratios (Öztekin & Flannery 2012; Öztekin 2015). Following these studies, we examine how lagged cultural diversity affects leverage ratios. We also test the contemporaneous relation between cultural diversity and capital structures, the results do not materially change.

Table 5-3: The effect of cultural diversity on leverage ratios

	Panel A: Book leverage ratio _t					
	(1)	(2)	(3)	(4)	(5)	(6)
Cultural diversity _{t-1}	-1.0427*** (-11.23)	-0.7773*** (-4.53)		-0.8187*** (-6.49)		-0.6680*** (-3.71)
Growth opportunity _{t-1}	5.7584*** (12.37)	5.8669*** (12.44)	5.7241*** (12.19)	5.8412*** (12.51)	5.8290*** (12.39)	5.9300*** (12.54)
Tangibility _{t-1}	1.2570*** (10.33)	1.1958*** (9.80)	1.1985*** (9.81)	1.2561*** (10.29)	1.1943*** (9.75)	1.1915*** (9.74)
Firm size _{t-1}	5.0211*** (33.89)	4.7478*** (28.49)	4.8301*** (29.29)	4.9569*** (33.08)	4.7383*** (28.05)	4.7077*** (27.78)
Profitability _{t-1}	-0.2926*** (-9.36)	-0.3129*** (-9.81)	-0.3172*** (-9.89)	-0.2983*** (-9.43)	-0.3208*** (-9.90)	-0.3166*** (-9.82)
Shared religion _{t-1}		-14.8931*** (-6.10)	-14.1265*** (-5.77)		-14.5366*** (-5.91)	-14.9417*** (-6.09)
Shared language _{t-1}		13.8614*** (3.91)	17.0694*** (4.76)		16.1781*** (4.11)	13.9168*** (3.56)
Shared law _{t-1}		-11.4228*** (-3.78)	-14.1054*** (-4.61)		-12.5718*** (-3.64)	-11.0105*** (-3.21)
Geographical distance _{t-1}		0.2448 (0.85)	-0.6568*** (-3.67)		-0.2991 (-1.39)	0.3185 (1.09)
GDP growth rate volatility _{t-}				-0.3894 (-1.47)	-0.6405** (-2.44)	-0.3353 (-1.24)
Exchange rate volatility _{t-1}				-0.2162*** (-2.98)	-0.1552** (-2.10)	-0.1075 (-1.42)
Inflation volatility _{t-1}				-0.0008 (-0.28)	-0.0004 (-0.13)	-0.0003 (-0.10)
Constant	-72.2498*** (-35.79)	-64.6975*** (-23.89)	-58.6160*** (-25.76)	-68.7346*** (-30.73)	-58.5363*** (-25.04)	-63.6222*** (-23.02)
Industry + year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.1722	0.1778	0.1762	0.1727	0.1766	0.1777
Number of observations	10,444	10,444	10,444	10,414	10,414	10,414
	Panel B: Market leverage ratio _t					
	(1)	(2)	(3)	(4)	(5)	(6)
Cultural diversity _{t-1}	-0.9489*** (-13.23)	-0.5582*** (-4.01)		-0.8649*** (-8.39)		-0.5437*** (-3.73)
Growth opportunity _{t-1}	-6.1582*** (-17.97)	-6.1021*** (-17.70)	-6.2043*** (-18.11)	-6.1121*** (-17.84)	-6.1497*** (-17.95)	-6.0683*** (-17.63)
Tangibility _{t-1}	0.7527*** (7.88)	0.7212*** (7.50)	0.7234*** (7.51)	0.7540*** (7.87)	0.7230*** (7.48)	0.7206*** (7.46)
Firm size _{t-1}	2.9761*** (24.45)	2.9480*** (21.34)	3.0074*** (22.04)	2.9571*** (24.08)	2.9746*** (21.36)	2.9492*** (21.09)
Profitability _{t-1}	-0.1830*** (-10.20)	-0.1985*** (-10.80)	-0.2016*** (-10.92)	-0.1884*** (-10.39)	-0.2065*** (-11.09)	-0.2031*** (-10.96)
Shared religion _{t-1}		-9.9174*** (-5.10)	-9.3644*** (-4.76)		-10.0481*** (-5.31)	-10.3835*** (-5.53)
Shared language _{t-1}		6.1144** (2.04)	8.4046*** (2.83)		8.0655** (2.48)	6.2380* (1.92)
Shared law _{t-1}		-3.3504 (-1.34)	-5.2653** (-2.12)		-4.0569 (-1.43)	-2.7951 (-0.99)
Geographical distance _{t-1}		-0.3537 (-1.47)	-1.0009*** (-6.77)		-0.8319*** (-4.57)	-0.3290 (-1.34)
GDP growth rate volatility _{t-}				-0.074 (-0.30)	-0.2468 (-0.99)	0.0016 (0.01)
Exchange rate volatility _{t-1}				-0.1294** (-2.00)	-0.103 (-1.59)	-0.0644 (-0.98)
Inflation volatility _{t-1}				-0.0011 (-0.33)	-0.0007 (-0.21)	-0.0007 (-0.19)
Constant	-25.2486*** (-15.00)	-18.1256*** (-7.88)	-13.7632*** (-7.29)	-23.3834*** (-12.39)	-13.4704*** (-6.85)	-17.6025*** (-7.46)
Industry + year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.1647	0.1687	0.1674	0.1658	0.1687	0.1697
Number of observations	10,389	10,389	10,389	10,358	10,358	10,358

This table reports coefficient estimates of OLS regressions of leverage ratios on cultural diversity, firm- and country- level and macro-economic control variables. All variables are detailed in Appendix: Variable Description. Numbers in parentheses report t-statistics based on White-corrected robust standard errors. *, **, and *** stand for 10%, 5%, and 1% significance levels, respectively.

one-year lagged cultural diversity to predict the leverage ratio.

Cultural diversity may be a proxy for other country-level effects, such as religion, language, and law (Stulz & Williamson 2003). In particular, the effects of cultural diversity may be closely related to geographical distance (Mian 2006). To distinguish between the direct effects of cultural diversity on the leverage ratio, we control for the country-level factors. Column 2 of Panel A indicates that while the magnitude of the coefficient on cultural diversity reduces compared to the result in Column 1, it is still negative and significant at the 1% level. This result suggests that cultural diversity distinctively affects the book leverage ratio of multinational firms, rather than being a mere proxy for country-level effects. In Column 3 of Panel A, we exclude cultural diversity and find that the effect of geographical distance becomes significant and negative, while other country-level variables remain significant. This result verifies the close relation between cultural diversity and geographical distance. However, by untangling cultural diversity and geographical distance, our result suggests that the negative effect of global diversification on leverage ratios documented by prior multinational capital structure studies, such as Doukas and Pantzalis (2003), is more closely associated with cultural diversity. These results are also in line with prior culture and finance studies. For instance, Siegel *et al.* (2011), after controlling for geographical distance, find that cultural distance has a significantly negative effect on cross-border syndicated loans.

Studies suggest that macroeconomic factors can affect the capital structures of multinational firms (Burgman 1996; Desai *et al.* 2008). To address the concern that the effect of cultural diversity on capital structure is influenced by macroeconomic risks, we follow Desai *et al.* (2008) and control for economic growth, foreign exchange, and inflation rate volatilities. The result shows that the negative effect of cultural diversity on capital structure holds and remains highly significant. In Column 5, we include country-

level factors but exclude cultural diversity; the result suggests that economic growth and foreign exchange volatilities continue to have the negative impact on leverage ratios. However, in Column 6, when we include cultural diversity along with all the control variables, the effects of macroeconomic factors become insignificant. These results suggest that the influence of cultural diversity on the capital structures of multinational firms is stronger compared to the effects of macroeconomic exposures. There are three possible reasons. First, economic risks can be diversified through international operations. As business cycles are different across countries, international diversification can stabilize cash flows and reduce economic risks (Lee & Kwok 1988). In contrast, the effect of culture cannot be diversified away. Instead, it increases the informational complexity of firms' operations. Second, economic risks can be mitigated if there are bilateral or regional trade agreements between countries. Cultural difference is unlikely to change by signing such agreements. Finally, exchange risks can be hedged using financial derivatives. It is difficult to determine the price, size, and terms of such contracts to hedge against the cultural diversity exposure of multinational firms. Therefore, cultural exposures can be more difficult to manage than economic risks.

The effects of cultural diversity on the book leverage ratio is also economically significant, a one-standard deviation increase in cultural diversity predicts a decrease of 1.73% in the book leverage ratio (where the mean is 29.18%). In Panel B, we examine the effect of cultural diversity on the market leverage ratio by repeating the above estimations. The results show that the negative effect of cultural diversity on leverage remains highly significant. The effect of cultural diversity on the market leverage ratio is also economically significant, a one-standard deviation increase in cultural diversity predicts a decrease in the market leverage ratio of 1.41% (where the mean is 18.25%). Other control variables have expected signs as well. For example, firm size and tangibility are positively related to leverage ratios, and firms with high profitability tend to have a

lower leverage ratio (Titman & Wessels 1988). Interestingly, we find that firm growth opportunity is positively related to the book leverage ratio and negatively related to the market leverage ratio. This divergence is consistent with Fama and French (2002) and has been discussed in prior studies.²⁷

In short, the results in this section confirm that the larger the cultural diversity, the lower the leverage ratios. These results provide important evidence for the existing findings that globalization strategy leads to a lower leverage ratio. By controlling country-level and macroeconomic factors, our results demonstrate that cultural diversity is one of the main causes of the lower leverage ratios of multinational firms.

5.4.1.2 *Alternative cultural measures*

As pointed out in Chapter 3, one concern is that our results could be biased to the cultural framework that we rely on. In this section, we address this concern by employing the four alternative cultural measures discussed in Chapter 3. Specifically, GLOBE's (2004) cultural value framework, Schwartz's egalitarianism scores in the year 2005 release of cultural values dataset (Siegel *et al.* 2011); and individualism and trust from the World Value Survey.

In Table 5-4, we present results using these alternative measures of culture. We repeat the estimation process that we used based on the Hofstede's framework to evaluate the effect of cultural diversity on leverage ratios. In Panel A of Table 5-4, we include only firm-level controls along with cultural diversity, the results consistently show that whichever measures of culture, cultural diversity has a negative effect on book and market leverage ratios, and these effects are statistically significant at the 1% level.

²⁷ On the one hand, as higher growth opportunity increases the value of shareholders and reduces financial distress, leverage ratios are expected to increase to mitigate agency costs between managers and shareholders (Titman & Wessels 1988). On the other hand, although growth opportunities add value to firms, they cannot generate current accounting profits and therefore cannot be collateralised. Thus, growth opportunities should negatively relate to leverage (Goyal *et al.* 2002).

Table 5-4: Cultural diversity and leverage ratios – alternative cultural measures

Dependent variable	Book leverage ratio _t				Market leverage ratio _t			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Firm-level controls only								
GLOBE cultural diversity _{t-1}	-1.1238*** (-11.49)				-1.0117*** (-13.30)			
Egalitarian diversity _{t-1}		-4.8162*** (-14.52)				-4.2120*** (-16.63)		
Individualistic diversity _t			-6.0140*** (-14.82)				-5.1640*** (-16.07)	
Trust diversity _{t-1}				-2.2977*** (-6.99)				-2.3142*** (-8.80)
Constant	-71.692*** (-35.71)	-71.266*** (-36.23)	-71.799*** (-36.33)	-69.368*** (-34.31)	-24.811*** (-14.86)	-24.351*** (-14.99)	-24.799*** (-15.09)	-23.255*** (-13.70)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.1722	0.178	0.1785	0.1665	0.165	0.1711	0.1736	0.1618
N of observations	10,419	10,406	10,397	10,397	10,364	10,351	10,341	10,341
Panel B: Firm- and country-level controls								
GLOBE cultural diversity _{t-1}	-0.7247*** (-6.56)				-0.7729*** (-8.80)			
Egalitarian diversity _{t-1}		-3.6916*** (-10.05)				-3.5277*** (-12.42)		
Individualistic diversity _t			-4.7422*** (-9.96)				-4.4989*** (-11.77)	
Trust diversity _{t-1}				-0.5233 (-1.43)				-1.1446*** (-3.75)
Constant	-63.805*** (-27.01)	-65.732*** (-28.28)	-65.548*** (-28.15)	-60.703*** (-25.48)	-19.679*** (-10.01)	-20.898*** (-10.91)	-20.815*** (-10.77)	-17.484*** (-8.71)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.1772	0.1813	0.1814	0.1745	0.1685	0.1734	0.1758	0.1673
N of observations	10,419	10,406	10,397	10,397	10,364	10,351	10,341	10,341
Panel C: Firm-and macro-economic controls								
GLOBE cultural diversity _{t-1}	-0.9643*** (-7.27)				-0.9695*** (-8.92)			
Egalitarian diversity _{t-1}		-4.7960*** (-11.33)				-4.3729*** (-12.86)		
Individualistic diversity _t			-5.8579*** (-11.60)				-5.1496*** (-12.24)	
Trust diversity _{t-1}				-0.6691 (-1.56)				-1.2662*** (-3.59)
Constant	-68.808*** (-31.09)	-69.672*** (-32.63)	-69.759*** (-32.49)	-64.222*** (-28.33)	-23.401*** (-12.55)	-23.652*** (-13.32)	-23.559*** (-13.08)	-19.925*** (-10.36)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.1723	0.1779	0.1784	0.1691	0.1658	0.1721	0.1746	0.1644
N of observations	10,390	10,376	10,367	10,367	10,334	10,320	10,310	10,310
Panel D: Firm-level, country-level and macro-economic controls								
GLOBE cultural diversity _{t-1}	-0.6592*** (-4.78)				-0.7650*** (-6.84)			
Egalitarian diversity _{t-1}		-3.9707*** (-9.07)				-3.7921*** (-10.87)		
Individualistic diversity _t			-4.8197*** (-8.80)				-4.5565*** (-10.23)	
Trust diversity _{t-1}				0.5701 (1.30)				-0.3685 (-1.01)
Constant	-62.880*** (-25.44)	-65.604*** (-27.15)	-64.940*** (-26.93)	-57.807*** (-23.28)	-19.246*** (-9.27)	-20.869*** (-10.42)	-20.289*** (-10.07)	-15.364*** (-7.23)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.1768	0.1811	0.181	0.1756	0.1694	0.1745	0.1769	0.1694
N of observations	10,390	10,376	10,367	10,367	10,334	10,320	10,310	10,310

This table reports the coefficient estimates of the effect of cultural diversity on four alternative measures with book and market leverage ratios. Panel A reports the effect of cultural diversity controlling for firm-level variables only. Panel B reports the effect of cultural diversity controlling for firm- and country-level variables. Panel C reports the effect of cultural diversity controlling for firm-level and macro-economic variables. Panel D reports the effect of cultural diversity controlling for firm- and country-level as well as macro-economic variables. The book leverage ratio is total debt divided by total book value of capital. The market leverage ratio is total debt divided by book value of total debt plus market value of equity. Cultural diversity is based on four alternative cultural measures. (1) GLOBE's (House et al, 2004) value dimensions. (2) Schwartz Egalitarianism scores (Siegel et al., 2011) of the 2005 release of the data set. (3) World Value Survey individualism scores. (4) World Value Survey trust scores. All variables are detailed in Appendix: Variable Description. Numbers in parentheses report t-statistics based on White-corrected robust standard errors. *, **, and *** stand for 10%, 5%, and 1% significance levels, respectively.

The negative coefficients on cultural diversity hold when we control for country-level factors (Panel B) and macroeconomic risks (Panel C), respectively. In Panel D of Table 5-4, we control for firm-level determinants, country-level factors, as well as macroeconomic risk factors, the negative effect of cultural diversity on leverage ratios remains significant in seven out of eight specifications, the only exception is the effect of trust diversity on the book leverage ratio.

To summarise, the results suggest that the negative effect of cultural diversity on leverage ratios is robust to alternative cultural frameworks and confirm that cultural diversity is an important factor that lowers the leverage ratios of multinational firms. As we also find evidence that cultural diversity forms frictions that impede firms to adjust back to the optimal debt level (the higher the cultural diversity, the lower the adjustment speed),²⁸ the results reported here suggest the lower leverage ratios are not at the optimal level for multinational firms. In the remaining estimations of Section 4.1, we shall use Hofstede's framework to measure cultural diversity to save space, but similar results hold for alternative measures.

5.4.1.3 Robustness over the global financial crisis

Although the dominant culture of a country remains relatively constant, cultural diversity changes as multinational firms increase or curtail foreign operations. In particular, our sample period covers the global financial crisis. Thus, the influence of cultural diversity on the capital structure may also vary with periods. To address the concern that the effect of cultural diversity on leverage ratios is time- dependent, we estimate cross-sectional regressions for two sub-periods: 2004-2008 and 2009-2013. These two sub-periods can be viewed as before and after the financial crisis periods. In

²⁸ Results are reported in Appendix 5-I, which is attached at the end of this chapter. It can be seen that firms with the lowest cultural diversity (Q1) have the highest speed of adjustment (SOA), with 0.21 in the one-step GMM model and 0.20 in the two-step GMM model, respectively. In contrast, firms with the highest cultural diversity (Q4) have the slowest SOA, with 0.03 in the in the one-step GMM model and 0.04 in the two-step GMM model, respectively.

Panel A of Table 5-5, we report results for the 2004-2008 period; and in Panel B of Table 5-5, we report results for the 2009-2013 period. The results show that the negative impact of cultural diversity on firm leverage is significant in both sub-periods, no matter whether the book or the market leverage ratio is used.

Given that the pooled time-series may render observations not independent, we also conduct Fama and MacBeth (1973) regressions with correction for autocorrelation to evaluate the robustness of the results. Panel C in Table 5-5 reports these results. We find that, after considering time effects, the influence of cultural diversity on leverage ratios remains negative and coefficients are significant at the 1% level. The results also show that all firm-level determinants remain significant. In addition, shared religion consistently shows a significant effect, suggesting that concentrating operations in markets with the same religion may render a firm reluctant to increase leverage ratios compared to firms operating in markets with different religions.²⁹ Overall, these findings suggest that the negative influence of cultural diversity on leverage ratios is robust over time and that the effect is not fundamentally changed by the financial crisis.

5.4.1.4 Endogeneity concern

Roberts and Whited (2013) argue that one endogeneity concern in capital structure studies is that managers may use their private information to determine leverage ratios. However, this information may not be feasibly modelled in regressions and therefore omitted variables can be a problem. To exclude this possibility, we follow the suggestion of Roberts and Whited (2013) and use propensity score matching. We estimate the treatment effect on firms with non-zero cultural diversity matching with firms with zero cultural diversity. In two situations, a firm may have zero cultural diversity. The first

²⁹ Hilary and Hui (2009) document that religiosity is negatively related to risk-taking activities. When a firm concentrates operations in one religion, its investors react more positively to firms' investment decisions and the firm is less likely to increase the use of leverage.

Table 5-5: Cultural diversity and leverage ratios – sub-period analysis

	Panel A: 2004 – 2008		Panel B: 2009 – 2013		Panel C: Whole sample	
	Book leverage ratio _t	Market leverage ratio	Book leverage ratio _t	Market leverage ratio	Book leverage ratio _t	Market leverage ratio
Cultural diversity _{t-1}	-0.6226** (-2.07)	-0.5563** (-2.27)	-0.7683*** (-3.25)	-0.4972*** (-2.67)	-0.7666*** (-6.51)	-0.5579*** (-5.79)
Growth opportunity _{t-1}	6.2294*** (7.45)	-6.6261*** (-11.05)	5.8392*** (10.60)	-5.6292*** (-13.56)	6.3868*** (15.17)	-5.9858*** (-19.32)
Tangibility _{t-1}	1.0479*** (5.60)	0.7163*** (4.90)	1.3438*** (8.48)	0.7334*** (5.71)	1.1683*** (10.17)	0.7115*** (8.72)
Firm size _{t-1}	4.0105*** (14.80)	2.5453*** (10.76)	5.2192*** (24.13)	3.2679*** (19.81)	4.5205*** (11.19)	2.8146*** (10.61)
Profitability _{t-1}	-0.3779*** (-6.39)	-0.2131*** (-5.95)	-0.2812*** (-8.09)	-0.1939*** (-10.14)	-0.3475*** (-8.50)	-0.2147*** (-13.78)
Shared religion _{t-1}	-15.8422*** (-4.13)	-8.8952*** (-2.84)	-14.4899*** (-4.55)	-11.2996*** (-4.99)	-13.0527*** (-18.38)	-7.7020*** (-5.64)
Shared language _{t-1}	8.2922 (1.29)	7.1592 (1.27)	16.7830*** (3.35)	5.6178 (1.40)	9.6965* (1.92)	3.8399 (1.54)
Shared law _{t-1}	-4.6915 (-0.78)	-3.7652 (-0.73)	-13.5423*** (-3.21)	-1.6069 (-0.47)	-6.5405 (-1.50)	-0.5122 (-0.25)
Geographical distance _{t-1}	0.3788 (0.87)	-0.1604 (-0.41)	0.1022 (0.26)	-0.6244** (-1.96)	0.5344 (1.77)	-0.2189 (-0.98)
GDP growth rate volatility _{t-1}	0.3734 (0.84)	0.6872 (1.44)	-0.7934** (-2.31)	-0.3989 (-1.41)	-0.6140* (-1.91)	-0.1555 (-0.81)
Exchange rate volatility _{t-1}	-0.2252* (-1.83)	-0.1882* (-1.74)	-0.0872 (-0.85)	-0.0154 (-0.17)	-0.4065** (-2.59)	-0.2960** (-2.66)
Inflation volatility _{t-1}	-0.0004 (-0.13)	-0.0009 (-0.26)	0.7454** (2.49)	0.2899 (1.28)	0.4758*** (4.74)	0.3609*** (7.90)
Constant	-37.1838*** (-9.32)	-10.1911*** (-2.88)	-67.7492*** (-19.44)	-20.5719*** (-7.12)	-47.0242*** (-16.81)	-12.1796*** (-5.29)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	--	--
Adjusted R ² or R ²	0.144	0.1635	0.2145	0.1761	0.1931	0.1683
Number of observations	4,808	4,788	5,606	5,570	10,414	10,358

This table reports the coefficients estimates of OLS regressions for two sub-sample periods and of the Fama-Macbeth approach for the whole sample. All variables are detailed defined in Appendix: Variable Description. Numbers in parentheses report t-statistics based on White-corrected robust standard errors. We report *Adjusted R²* for OLS and *R²* for Fama-Macbeth regressions. *, **, and *** stand for 10%, 5%, and 1% significance levels, respectively.

situation is that the firm is a purely domestic firm and the second situation is that the firm concentrates the operations in one foreign country.³⁰ If managerial leverage decisions are irrelevant to cultural diversity, we would expect to see a similar treatment effect on the leverage ratios of firms with cultural diversity and those without.

In Panel A of Table 5-6, we match our sample firms with purely domestic firms by four firm-level characteristics. The results of the first stage, the propensity score generating process, shows that the coefficients of growth opportunity, tangibility and firm size are positive and significant at the 1% level. This suggests that firms with a higher growth opportunity, a large proportion of tangible assets and a larger size are more likely to expand overseas and therefore to be culturally diverse. In the second stage, we use three different propensity score matching techniques: the nearest neighbour matching, the satisfaction matching, and the Kernel matching approach. In all three matching approaches, the average treatment effects for the treated sample are negative and significant at the 1% level, suggesting that after matching firm-level determinants of capital structure, both book and market leverage ratios are significantly lower for firms with cultural diversity compared to purely domestic firms.

In Panel B of Table 5-6, we match our sample firms with firms concentrating operations in one foreign country by geographical distance in addition to four firm-level characteristics. The first-stage result shows that the coefficients on geographical distance, tangibility, size, and profitability are positive and significant. In contrast, the coefficient of growth opportunity is significantly negative. In the second stage, the results of the average treatment effect for the treated sample show that for five out of six estimations,

³⁰ Our data suggest that firms concentrating their overseas operation in only one foreign country is common – around 25% of such firms in our whole dataset. Recall our formula to calculate cultural diversity: $Cultural\ diversity_i = \sum_{j=1}^J Distance_{US,j} \cdot N_{ij} \ln(1/N_{ij})$. If all subsidiaries are incorporated in one foreign country, then $N_{ij}=1$ and $\ln(1/N_{ij}) = 0$. Therefore, firms concentrating their operations in only one foreign country would end up with a zero cultural diversity.

Table 5-6: Cultural diversity and leverage ratios – propensity score match

Panel A: Match with purely domestic firms								
First-stage	Coefficient				t-statistic			
Growth opportunity	0.1249***				(4.67)			
Tangibility	0.0300***				(2.70)			
Firm size	0.0832***				(6.57)			
Profitability	0.0004				(0.26)			
Pseudo R^2	0.0226							
N of Observations	10,566							
Second-stage	Book leverage ratio				Market leverage ratio			
	Coef.	t-statistic	# treat	# control	Coef.	t-statistic	# treat	# control
ATT Nearest Neighbour	-10.05***	(-7.15)	9,967	537	-10.63***	(-4.96)	9,967	537
ATT Stratification	-10.04***	(-5.59)	9,967	2,862	-10.08***	(-10.64)	9,967	2,862
ATT Kernel Match	-6.44***	(-3.54)	9,967	598	-8.97***	(-8.14)	9,967	598
Panel B: Match with firms operating in one foreign country								
First-stage	Coefficient				t-statistic			
Geographical distance	0.7788***				(48.57)			
Growth opportunity	-0.0973***				(-4.43)			
Tangibility	0.0325***				(3.07)			
Firm size	0.2038***				(16.99)			
Profitability	0.0058***				(5.22)			
Pseudo R^2	0.4650							
N of Observations	11,854							
Second-stage	Book leverage ratio				Market leverage ratio			
	Coef.	t-statistic	# treat	# control	Coef.	t-statistic	# treat	# control
ATT Nearest Neighbour	-10.57***	(-3.48)	9,639	931	-9.75***	(-5.09)	9,639	930
ATT Stratification	-9.93***	(-3.15)	9,639	2,212	-9.74***	(-4.40)	9,639	2,212
ATT Kernel Match	-2.71	(-1.52)	9,639	2,212	-7.17***	(-5.03)	9,639	2,212
Panel C: OLS regressions results relative to firms with zero cultural diversity								
Dependent variable	Book leverage ratio				Market leverage ratio			
	Coef.	t-statistic	Adj- R^2	N	Coef.	t-statistic	Adj- R^2	N
Cultural diversity	-0.64***	(-3.60)	0.181	10,606	-0.56***	(-3.86)	0.179	10,548
Panel D: Fama-Macbeth regressions results relative to firms with zero cultural diversity								
Dependent variable	Book leverage ratio				Market leverage ratio			
	Coef.	t-statistic	Adj- R^2	N	Coef.	t-statistic	Adj- R^2	N
Cultural diversity	-0.76***	(-5.46)	0.199	10,606	-0.58***	(-5.88)	0.177	10,548

This table reports the results of propensity score matches. Panel A reports results comparing the leverage ratios of multinational firms with non-zero cultural diversity to those of purely domestic firms. Panel B reports results comparing the leverage ratios of multinational firms with non-zero cultural diversity to those of firms operating in only one foreign country. Panel C reports the OLS regression results of leverage ratios for multinational firms with non-zero cultural diversity to those of firms with zero cultural diversity. Panel D reports the Fama-Macbeth regression results of leverage ratios of multinational firms with non-zero cultural diversity to that of firms with zero cultural diversity. ATT Nearest Neighbor is the average effect of the treatment on the treated based on nearest neighbor matching. ATT Stratification is the average effect of the treatment on the treated based on stratification matching. ATT Kernel Match is the average effect of the treatment on the treated matched with kernel weighting. The regressions in Panel C and D include control variables described in Appendix. Numbers in parentheses report t-statistics based on the White-corrected robust standard errors. We report *Adjusted R*² for OLS and *R*² for Fama-Macbeth regressions. *, **, and *** stand for 10%, 5%, and 1% significance levels, respectively.

the effects are negative and significant (except for the Kernel matching on book leverage ratios). This suggests that firms with higher levels of cultural diversity have significantly lower leverage ratios compared to firms that operate in only one foreign country.

In Panels C and D of Table 5-6, we estimate the effect of cultural diversity relative to firms with zero cultural diversity. We adjust book and market leverage ratios relative to the mean value of leverage ratios of firms with zero cultural diversity. In Panel C, we report estimation results from OLS regressions, and in Panel D we report estimation results from the Fama-MacBeth regressions. In all regressions, we control for firm-level determinants, country-level factors, and macroeconomic volatilities. These results consistently show that cultural diversity is negatively associated with adjusted book and market leverage ratios, suggesting that leverage ratios decrease as cultural diversity increases relative to firms with zero cultural diversity. These results confirm that cultural diversity is relevant to leverage ratio decisions.

5.4.1.5 Further robustness and economic importance

Prior studies suggest that industry effects are important for firm capital structure decisions (Titman & Wessels 1988; MacKay & Phillips 2005). Although in previous sections, we include industry dummies to control for industry effects, this approach does not consider that within an industry, a firm's leverage ratio may not be relevant as a key variable of interest (Lang *et al.* 1996). In our case, firms with a higher degree of cultural diversity may have higher or lower leverage in the same industry. To address this concern, we use Lang *et al.* (1996)'s approach by subtracting the industry mean and then estimate Equation (5A).

In Table 5-7, we report the results of industry-adjusted regressions estimated by OLS (Panel A) and Fama-MacBeth regressions (Panel B). Again, we find a negative and significant relation between cultural diversity and leverage ratios. As shown in the first two columns of Panel A and Panel B of Table 5-7, after adjusting for industry effects,

cultural diversity is associated with decreases in both book (A.1 and B.1) and market (A.2 and B.2) leverage ratios. Thus, firms with a higher cultural diversity will have a lower leverage ratio than the industry average. Overall, the results show that the negative relation between cultural diversity and leverage ratios remains across industries.

Another important way to address the economic importance of the effect of cultural diversity on leverage ratios is to assess debt service. On the one hand, debt service is closely related to operating cash flows and a reduction in debt service overestimates operating cash flows (Lang *et al.* 1996). On the other hand, reducing debt service eases bankruptcy costs and reduces agency costs of debt (Mello & Parsons 1992; Mella-Barral & Perraudin 1997). Therefore, if global diversification increases agency costs of debt and leads to lower leverage ratios as argued by prior studies, then we would expect that cultural diversity is positively related to debt service. We measure book and market debt service as interest paid on debt divided by the book and market value of total capital, respectively. In the last two columns of Panel A and B of Table 5-7, we report regression results estimated by OLS and Fama-MacBeth regressions. In Panel A, the result shows that the effect of cultural diversity on both book (A.3) and market (A.4) debt service ratios is negative and significant. In Panel B, the results show that cultural diversity is negatively related to market debt service ratios (B.4), but is insignificantly related to book debt service ratios (B.3). Most important, these results do not provide evidence that cultural diversity is positively related to debt service. Therefore, it seems difficult to argue that cultural diversity lowers leverage ratios because it increases agency costs of debt. In the next section, we provide a further explanation on the channels through which cultural diversity affects multinational capital structures by thoroughly looking into debt and equity activities.

Table 5-7: Economic importance of the relation between cultural diversity and leverage ratios

	Panel A: OLS regression				Panel B: Fama-Macbeth regression			
	IA_Book	IA_Market	DS_Book	DS_Market	IA_Book	IA_Market	DS_Book	DS_Market
	(A.1)	(A.2)	(A.3)	(A.4)	(B.1)	(B.2)	(B.3)	(B.4)
Cultural diversity _{<i>t</i>-1}	-0.5313*** (-3.79)	-0.6504*** (-5.71)	-0.0196* (-1.75)	-0.0148* (-1.92)	-0.4761*** (-7.93)	-0.5828*** (-10.86)	-0.0110 (-0.60)	-0.0226** (-3.07)
Firm level <i>variables</i> _{<i>t</i>-1}	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-level <i>variables</i> _{<i>t</i>-1}	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic <i>variables</i> _{<i>t</i>-1}	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	--	--	--	--
<i>Adjusted R</i> ² or <i>R</i> ²	0.1702	0.1625	0.0702	0.1495	0.1889	0.161	0.0972	0.1537
Number of observations	8,892	8,884	9,663	9,663	8,892	8,884	9,090	8,966

This table reports the coefficient estimates of OLS regressions and of Fama-Macbeth regressions for four robust measures of leverage ratios. IA_Book represents industry adjusted book leverage ratios. IA_Market represents industry adjusted market leverage ratios. Industry adjusted ratios are calculated by subtracting the mean values of industry ratios from each firm's leverage ratio. Industry is based on SIC primary classification. DS_Book represents the book debt service ratio and is calculated dividing interest paid on debt by the book value of total capital. DS_Market represents the market debt service ratio and is calculated dividing interest paid on debt by the market value of total capital. All variables are detailed defined in Appendix: Variable Description. Numbers in parentheses report t-statistics based on White-corrected robust standard errors. We report *Adjusted R*² for OLS and *R*² for Fama-Macbeth regressions. *, **, and *** stand for 10%, 5%, and 1% significance levels, respectively.

5.4.2 Cultural diversity and the debt-equity choice

Our earlier analyses find a negative effect of cultural diversity on leverage ratios. However, the mechanism underlying this effect is unclear. A decrease in leverage ratios can be caused by a reduction in debt or by an increase in equity. Distinguishing the channel is important because the primary concern of this chapter is that changes in cultural diversity lead to changes in the capital structure decisions of multinational firms. Leverage ratios can only reflect overall situations of capital structure, whereas an analysis of debt-equity activities can reveal the underlying structure whereby cultural diversity causes capital structures to change.

To illustrate the importance of investigating financial activities, Panel A of Table 5-8 shows the number and percentage of firm-year observations regarding debt and equity activities. First, we observe that the most common activity for both debt and equity is the simultaneous issuance and retirement in the same firm-year, with 40.26% and 39.32% of total debt and equity activities, respectively. Second, for around 75% of the total firm-year observations where we observe equity activities, 66% of the total observations conduct debt activities. In addition, 1,816 firm-year observations use both equity and debt. Panel B of Table 5-8 reports the dollar amount of debt and equity activities and the both of them. It shows that the medians of equity issuance is close to \$1.9 million and debt retiring is close to \$1.8 million; whereas the medians of equity retiring and debt issuance is zero. This suggests that equity issuance and debt retiring are indeed two dominant financial activities, which are both likely to result in leverage ratio to decrease. In regard to both equity and debt activities conducted in the same firm-year, it shows that the value of retiring is more than that of issuing. These figures illustrate the pervasiveness of financial activities in the sample firms.

Table 5-8: Distribution of debt-equity activities

Debt			Equity		Both debt and Equity		
Panel A: By volume of activities							
	Number	% Total	Number	% Total		Number	% Total
Issuing	537	3.40%	5,017	32.17%	Issuing	198	10.90%
Retiring	3,536	22.42%	610	3.91%	Retiring	133	7.32%
Both issuing and retiring	6,350	40.26%	6,131	39.32%	Issue equity retire debt	1,465	80.67%
Neither issuing nor retiring	5,350	33.92%	3,835	24.59%	Issue debt retire equity	20	1.10%
Total	15,773	100.00%	15,593	100.00%		1,816	100.00%
Panel B: By size of activities							
	Value	%Assets	Value	%Assets		Value	%Assets
Issuing	0.00	0.33%	1940.50	0.63%		10,895.00	3.74%
Retiring	1806.00	1.81%	0.00	0.01%		11,649.00	5.11%
Net issuance	0.00	0.00%	0.00	0.03%		0.00	-0.30%

This table reports the volume and size of firm-year observations with indicated financial activities. Panel A reports the number of debt, equity and both activities. Panel B reports the median value of the debt equity and both activities, the unit of the values is thousand dollar. The data cover a 10-year period between 2004 and 2013.

5.4.2.1 *Cultural diversity and debt-equity decisions*

In this section, we explore the effect of cultural diversity on debt-equity decisions. In particular, we examine how cultural diversity lowers leverage ratios conditional on the choice of financial instruments. This allows us to test the research question exploring whether multinational firms lower leverage ratios through issuing equity or reducing debt. Specifically, we estimate three probit regressions, for equity issuance, for debt retirement, and for both. Similar to Hovakimian *et al.* (2001) and Brav (2009), we control for financial deficits, in addition to variables used in earlier analyses, and also define financial deficits as dividend payments plus capital expenditures plus the net change in working capital minus operating cash flow after interest and taxes.

In Table 5-9, we report estimation results based on five cultural measures from Panel A to E. In each panel, the first column presents the financial decision on debt retirement. Surprisingly, the results in four out of five panels show that cultural diversity is negatively related to debt retirement, suggesting that multinational firms with higher degrees of cultural diversity are less likely to reduce debts. This finding sharply contrasts with arguments for the agency costs of debt in prior studies. These studies posit that the lower leverage ratios of multinational firms are caused by a reduction in debt because either debtholders are reluctant to lend capital to firms or debts are too costly for firms to borrow due to the increased monitoring costs of debtholders. However, our results are in line with Myers (1977) who suggest that debts are necessary when agency costs increase. Therefore, our findings do not support the argument that multinational firms with a higher degree of cultural diversity are more likely to reduce debt.

The second column in Table 5-9 shows the financial decision for equity issuances. The results show that the coefficients on cultural diversity are positive and significant in four out of five estimations, with the only exception being cultural diversity measured by trust. We also calculate marginal effects at means for the coefficients of cultural diversity

The results suggest that for firms with one unit more than the mean cultural diversity measured by the Hofstede and GLOBE framework, firms are 1% more likely to issue equity in the following period.³¹ For firms with one unit more than the mean cultural diversity measured by egalitarianism and individualism, firms are 5% more likely to issue equity in the following period. These results suggest that multinational firms with a higher degree of cultural diversity are more likely to issue equity.

The analyses have so far investigated equity issuance and debt retirement separately. However, one may argue that these results are driven by a dual decision. That is, it is likely that some firms who issue equity may retire debt in the same period. Likewise, firms who retire debt may meanwhile issue equity. This is a relevant concern, given that Table 5-8 shows that this dual decision occurs for around 12% out of the total financial activity observations, indicating that this case is not rare. In the third column of each panel in Table 5-9, we test the effect of cultural diversity on this dual decision. Specifically, we introduce a dummy for instances where a firm both issues equity and retires debt in the same year t , and then re-estimate probit regressions. In four out of five estimations, the coefficients are insignificant on cultural diversity; and in the regression with cultural diversity measured by individualism, the coefficient is negative and significant at the 5% level. These results generally do not support the argument that cultural diversity increases the likelihood of the dual decision of equity issuance and debt retirement, suggesting that the previous results not be driven by the dual decision of equity issuance and debt retirement during the same period.

Overall, the results in this section strongly support the argument that multinational firms with higher degrees of cultural diversity reduce leverage ratios by issuing equity rather than by reducing debt.

³¹ One unit above mean cultural diversity is a conservative estimate, given that standard deviations of cultural diversity are 2.57 and 2.41 measured by the Hofstede and GLOBE frameworks, respectively.

Table 5-9: Cultural diversity and debt-equity decisions

Dependent variable	Debt retiring _t	Equity issuing _t	Equity issuing _t and Debt retiring _t
Panel A: Hofstede			
Cultural diversity _{t-1}	-0.0482*** (-4.06)	0.0352*** (2.65)	-0.0094 (-0.84)
Financial deficits _{t-1}	0.2960*** (2.63)	-0.0568 (-0.47)	0.1343 (1.25)
Control variables	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Pseudo R ²	0.083	0.047	0.052
Number of observations	8,956	8,956	8,956
Panel B: GLOBE			
Cultural diversity _{t-1}	-0.0509*** (-4.11)	0.0430*** (3.13)	-0.0075 (-0.64)
Financial deficits _{t-1}	0.2843** (2.54)	-0.0867 (-0.72)	0.1015 (0.95)
Control variables	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Pseudo R ²	0.084	0.047	0.052
Number of observations	8,934	8,934	8,934
Panel C: Egalitarianism			
Cultural diversity _{t-1}	-0.2249*** (-5.89)	0.2021*** (4.71)	-0.0492 (-1.35)
Financial deficits _{t-1}	0.2775** (2.47)	-0.0541 (-0.45)	0.1117 (1.04)
Control variables	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Pseudo R ²	0.085	0.049	0.052
Number of observations	8,921	8,921	8,921
Panel D: Individualism			
Cultural diversity _{t-1}	-0.2684*** (-5.67)	0.2013*** (3.87)	-0.0932** (-2.08)
Financial deficits _{t-1}	0.2823** (2.51)	-0.1067 (-0.88)	0.0943 (0.87)
Control variables	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Pseudo R ²	0.086	0.047	0.052
Number of observations	8,907	8,907	8,907
Panel E: Trust			
Cultural diversity _{t-1}	0.04 (1.07)	-0.0087 (-0.21)	0.0519 (1.48)
Financial deficits _{t-1}	0.2898** (2.57)	-0.1157 (-0.96)	0.0984 (0.91)
Control variables	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Pseudo R ²	0.083	0.046	0.052
Number of observations	8,907	8,907	8,907

This table reports the results from three probit models about three financial decisions: debt retiring, equity issuing and both. All regressions include control variables described in Appendix. Numbers in parentheses report t-statistics based on White-corrected robust standard errors. We report *Adjusted R*² for OLS and *R*² for Fama-Macbeth regressions. *, **, and *** stand for 10%, 5%, and 1% significance levels, respectively.

5.4.2.2 *Cultural diversity and net issuance of debt and equity*

One concern about the results presented in the previous section arises from the way we classifies financial decisions. Specifically, we neither simultaneously consider equity repurchase with equity issuance nor debt issuance with debt retirement, because equity repurchase and debt issuance do not directly answer the question of how lower leverage ratios associated with cultural diversity are generated. In this section, instead of looking at absolute level of debt and equity issuance, we look at net debt and equity offerings as some firms issuing equities may also conduct share repurchases and firms that retire debts also issue debts. As Table 5-8 shows, issuing and retiring activities in the same firm-year for debt and equity are 40.26% and 39.32%, respectively.

To address this concern, we examine the effect of cultural diversity on the amount of net equity and debt issuance, respectively. In the spirit of Hovakimian *et al.* (2001), we define net equity issuance as the total amount of equity issuance minus equity repurchase in year t , and we define net debt issuance as the total amount of debts issuance minus debt retirement in year t . We employed first difference and fixed effects estimations, as firm financial decisions are prone to endogeneity problems. We also control for lagged net equity/debt issuance because financial activities in the previous period may affect the current fund-raising amount. In Table 5-10, we report results from the first difference regressions in Panel A and the fixed effects regressions in Panel B.³²

In Panel A, we find no evidence that cultural diversity and net debt issuance are related, regardless of the measures of culture. In contrast, all five measures of cultural diversity have significantly positive effects on net equity issuance. These results are in line with those from the previous section, suggesting that lower leverage ratios associated

³² We note that in Panel B, fixed effects specifications for net debt issuance have R^2 close to zero. In contrast, the first difference models have meaningful R^2 (with around 0.26 for net debt issuance regressions and 0.22 for net equity issuance regressions). We therefore mainly focus on the results from the first difference regressions and show results from fixed effects regressions as the robustness.

Table 5-10: Cultural diversity and net debt and equity issuance activities

Dependent variable	(Net Debt issuance/Assets) _t					(Net Equity issuance/Assets) _t				
Panel A: First difference										
Hofstede Cultural diversity _{t-1}	-0.0425 (-0.27)					0.3349*** (3.55)				
GLOBE Cultural diversity _{t-1}		-0.0221 (-0.14)					0.4061*** (3.57)			
Egalitarianism diversity _{t-1}			0.016 (0.03)					0.9869*** (2.63)		
Individualism diversity _{t-1}				0.3067 (0.48)					1.5193*** (3.26)	
Trust diversity _{t-1}					-0.0249 (-0.05)					0.5900* (1.77)
(Financial deficit/Assets) _{t-1}	4.4694*** (4.35)	4.4417*** (4.32)	4.4286*** (4.31)	4.4762*** (4.35)	4.4762*** (4.35)	-2.1855** (-2.51)	-2.2912*** (-2.64)	-2.2748*** (-2.61)	-2.3415*** (-2.69)	-2.3248*** (-2.67)
(Net Equity issuance/Assets) _{t-1}	-0.0238 (-1.15)	-0.0295 (-1.46)	-0.0291 (-1.44)	-0.0298 (-1.47)	-0.0299 (-1.47)	-0.3349*** (-12.53)	-0.3372*** (-12.72)	-0.3363*** (-12.67)	-0.3367*** (-12.67)	-0.3373*** (-12.67)
(Net Debt issuance/Assets) _{t-1}	-0.4314*** (-23.63)	-0.4323*** (-23.70)	-0.4330*** (-23.68)	-0.4319*** (-23.61)	-0.4319*** (-23.61)	0.0753*** (6.22)	0.0769*** (6.41)	0.0782*** (6.48)	0.0783*** (6.51)	0.0780*** (6.49)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.256	0.255	0.256	0.255	0.255	0.213	0.218	0.218	0.219	0.218
Number of observations	6,248	6,234	6,227	6,221	6,221	6,248	6,234	6,227	6,221	6,221
Panel B: Fixed effects										
Hofstede Cultural diversity _{t-1}	0.1490 (1.12)					0.2292** (2.15)				
GLOBE Cultural diversity _{t-1}		0.1142 (0.84)					0.2573** (2.31)			
Egalitarianism diversity _{t-1}			0.3490 (0.75)					0.4451 (1.19)		
Individualism diversity _{t-1}				0.5550 (1.04)					1.3135*** (2.95)	
Trust diversity _{t-1}					0.6919 (1.57)					0.2729 (0.84)
(Financial deficit/Assets) _{t-1}	4.9723*** (4.38)	4.9840*** (4.38)	4.9629*** (4.35)	4.7719*** (4.28)	4.7856*** (4.29)	-1.3399 (-1.18)	-1.4556 (-1.29)	-1.4520 (-1.28)	-1.3170 (-1.16)	-1.3127 (-1.15)
(Net Equity issuance/Assets) _{t-1}	-0.0994*** (-5.04)	-0.0977*** (-4.95)	-0.0980*** (-4.96)	-0.0944*** (-4.82)	-0.0946*** (-4.84)	0.0288 (0.97)	0.0149 (0.50)	0.0156 (0.53)	0.0148 (0.49)	0.0153 (0.51)
(Net Debt issuance/Assets) _{t-1}	-0.1665*** (-10.63)	-0.1651*** (-10.56)	-0.1655*** (-10.54)	-0.1662*** (-10.56)	-0.1663*** (-10.55)	0.0553*** (4.14)	0.0592*** (4.52)	0.0597*** (4.54)	0.0607*** (4.62)	0.0607*** (4.62)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Overall R ²	0.0002	0.0002	0.0002	0.0002	0.0002	0.0842	0.0849	0.0845	0.0855	0.0865
Number of observations	8,180	8,159	8,147	8,133	8,133	8,180	8,159	8,147	8,133	8,133

This table reports the coefficient estimates of first difference and fixed effects regressions for net equity and debt issuance on cultural diversity. Panel A presents first difference results, and Panel B presents fixed effects results. Net equity issuance is proceeds from the sales of common and preferred equity minus the retirements and repurchases of common and preferred equity. Net debt issuance is proceeds from total debt issuance minus the amount of total debt reduction. Net debt issuance and net equity issuance are scaled by total assets. All regressions include control variables. All variables are detailed in Appendix: Variable Description. Numbers in parentheses report t-statistics based on White-corrected robust standard errors and are clustered in firm. *, **, and *** stand for 10%, 5%, and 1% significance levels, respectively.

with cultural diversity are caused by increased equity issuance instead of debt activities. In addition, we find that financial deficits are positively related to the net debt issuance, but negatively related to the net equity issuance, suggesting that a firm mainly finances deficits through debts. Panel B shows that cultural diversity is positively associated with net equity issuance in three out of five regressions and is insignificantly related to net debt issuance throughout five regressions. Therefore, the results in this section offer are further evidence that that the decreases in leverage ratios associated with cultural diversity are related to by an increase in net equity issuances rather than a reduction in debt.

5.5 Conclusion

In Chapter 5, we examine the impact of cultural diversity on the capital structures of multinational firms. Using an entropy measure of cultural diversity, we find that cultural diversity is negatively related to book and market leverage ratios. This result holds after controlling for firm-level determinants commonly cited in the literature. The result remains valid when we further control for country-level factors. The result do not materially change with the control of macroeconomic volatilities, including economic growth, foreign exchange, and inflation rate volatilities. Also, our results are robust to alternative cultural measures, to different periods, and to endogeneity. These results suggest that cultural diversity plays a distinctive role determining firm leverage ratios, rather than acting as a proxy for the factors mentioned above. Further, we look into the channels through which cultural diversity reduces leverage ratios and find that multinational firms with higher degrees of cultural diversity are more likely to issue equity and less likely to reduce debt. Overall, these results do not support the arguments about the agency costs of debt and are consistent with the argument that complicated firms, such as multinational firms, are more likely to increase the use of equity.

Appendix 5-I: Cultural diversity and speed of adjustments of capital structures

	SOA	AR(1)	AR(2)	#Instruments	#Groups	#Obs
Panel A: One-step system GMM model						
Q1	0.2122*** (12.01)	-5.99***	-1.40	421	464	1,227
Q2	0.1687*** (14.78)	-5.37***	1.38	421	567	1,417
Q3	0.1775*** (12.17)	-5.57***	-2.06**	421	601	1,627
Q4	0.0307*** (17.77)	-8.38***	0.29	421	516	2,070
Panel B: Two-step system GMM model						
Q1	0.2025 (1.30)	-0.30	-0.12	421	464	1,227
Q2	0.1713*** (8.39)	-2.63***	-0.71	421	567	1,417
Q3	0.1877*** (11.76)	-4.64***	-1.43	421	601	1,627
Q4	0.0364*** (18.77)	-7.27***	0.13	421	516	2,070

This table reports one-step (Panel A) and two-step (Panel B) system GMM estimation of the adjustment speed to the target leverage ratio. The classification of quartile is based on the degree of cultural diversity with Q1 stands for the sub-sample with the lowest degree of cultural diversity, and Q4 stands for the sub-sample with the highest degree of cultural diversity. Following Öztekin and Flannery (2012), The speed of adjustment (SOA) is the coefficient λ estimated by the equation: $D_{i,t} - D_{i,t-1} = \lambda(D_{i,t}^* - D_{i,t-1}) + \varepsilon_{i,t}$, where $D_{i,t-1}$ is debts divided by total book value of capital for firm i at time $t-1$, and $TD_{i,t}^*$ is the target leverage ratio, which is determined by fundamental factors in the lagged period: $TD_{i,t}^* = \beta X_{i,t-1}$, where $X_{i,t-1}$ consists of cultural diversity, firm and country-level and macro-economic determinants of capital structures. All variables are detailed defined in Appendix: Variable Description. We employ the system generalized method of moments (GMM) model (Arellano & Bover 1995; Blundell & Bond 1998) as Öztekin and Flannery (2012). To ensure the robustness of the results, we use both one-step and two-step procedures. We divide sample firms into four groups according to the quartile of sample firms with the lowest cultural diversity (Q1) to the highest cultural diversity (Q4). All the estimations also control for year and industry fixed effects. Numbers in parentheses report t-statistics with Arellano and Bond (1991) bias-corrected standard errors. *, **, and *** stand for 10%, 5%, and 1% significance levels, respectively.

Chapter 6

Cultural Diversity and Dividend Policy

6.1 Introduction

Prior studies document that U.S. multinational firms' dividend policies are significantly different from those of purely domestic firms as impacted by the local environment of their foreign operations. Hines (1996) finds that dividend payouts for U.S. multinational firms are sustained strongly by their foreign operating profits, which compose a large part of the multinationals' total income.³³ Pinkowitz *et al.* (2006) suggest that the qualities of foreign governments have significant influences on the dividend policies multinational firms because dividends are more valuable for firms operating in foreign countries with lower government qualities. Desai *et al.* (2006) emphasise the capital controls of foreign countries and find that foreign subsidiaries located in countries with stricter capital controls are more likely to remit profits back to parent firms and increase their dividend payouts. Grubert (1998) and Altshuler and Grubert (2003) show that low tax rates stimulate foreign subsidiaries to reinvest earnings in local markets and discourage profit repatriation. As a result, multinationals operating in low-tax countries are reluctant to draw resources from their foreign subsidiaries to pay dividends to common shareholders.

While these studies document that foreign institutional factors are important to the dividend policy of multinational firms, they mainly focus on formal institutions. One important factor that has not been received sufficient attention is culture. Multinational

³³ According to U.S. Bureau of Economic Analysis (BEA), foreign revenue continuously constitutes a major part of U.S. multinationals' whole income. By the end of 2014, domestic operations generated net income of 1,213 billion and all foreign affiliates reported a net income of 1,291 billion. These figures suggest that more than half the profits of U.S. multinational firms come from overseas. (Data source: <https://www.bea.gov/international/di1usdop.htm>).

firms establish subsidiaries in different countries where cultures are different from one another. One would expect that these cultural differences significantly affect the dividend policies of multinational firms. Because culture is documented to have a fundamental influence on corporate financial strategies and decision-making (Gómez-Mejia & Palich 1997; Palich & Gomez-Mejia 1999; Williamson 2000). Further, prior cross-country studies provide evidence that national culture has a significant impact on payout policies. For example, Shao *et al.* (2010) find that firms in more conservative cultures pay higher dividends, whereas firms in cultures with higher degrees of mastery pay lower dividends. Chen *et al.* (2015) show that individualism and uncertainty avoidance are negatively related to dividend payouts. These studies demonstrate that, at the country level, cultural aspects have a different effect on dividend payouts. Nevertheless, how cultural diversity within a firm affects the firm's dividend policy remains an open question.

In this chapter, we empirically examine how cultural diversity affects the dividend policies of multinational firms. Specifically, we investigate the effect of cultural diversity in the context of two agency dividend models: the outcome and substitute model (La Porta *et al.* 2000). Cultural diversity intensifies agency issues due to increased monitoring costs, unfamiliarity, and firm complexity (Nohria & Ghoshal 1994; Roth & O'Donnell 1996). Therefore, if the substitute model holds, there will be a negative relation between cultural diversity and dividend payouts, as agency problems are not a significant concern of shareholders of U.S. multinationals when cultural diversity is high, given the strong legal system in the United States for investor protection. On the other hand, the outcome model argues that dividend payouts are positively related to the severity of agency problems, as legal force would require firms with higher cultural diversity to distribute cash to shareholders if cultural diversity intensifies agency problems. Therefore, if the outcome model holds, we would expect a positive relation between cultural diversity and dividend payouts.

As described in Chapter 3, we construct an entropy measure of cultural diversity that captures cultural distance and dispersion. To ensure our results are robust to the measures of dividend policy, we calculate five alternative ratios where cash dividends are divided by earnings, operating cash flows, sales, total assets, and market capitalization, respectively. By controlling for the determinants of dividend policy documented by prior studies, we consistently find that cultural diversity is negatively related to dividend ratios, suggesting that dividend payouts are lower in firms with a higher degree of cultural diversity. The negative relation between cultural diversity and dividend ratios holds when we use alternative cultural frameworks, different estimation techniques, and industry-adjusted dividend ratios. We confirm that the negative effects of cultural diversity on dividend payouts is not driven by young or small firms, which are normally viewed as the main non-dividend paying firms (Fama & French 2001; DeAngelo *et al.* 2006). Overall, the negative relation between cultural diversity and dividend payouts support the notion that globalization intensifies the agency problems of multinational firms.

In addition to the traditional determinants of dividend policy, we consider several factors related to a firm's international operations and affecting the relation between cultural diversity and dividend payouts. These factors include geographical distance (John *et al.* 2011), the degree of foreign operations (Hines 1996), and the quality of foreign governments (Pinkowitz *et al.* 2006). We find that the inclusion of these variables does not alter the negative relation between cultural diversity and dividend ratios. In addition, the prior studies document that firms in East Asian and civil law countries have lower dividend payout ratios (La Porta *et al.* 2000; Faccio *et al.* 2001). Thus, it is likely that lower dividend payouts with increased cultural diversity are driven by these countries. We conduct robustness checks by only including the firms that operate outside of East Asian countries and that dominantly operate in common law countries. These robustness

tests show that the negative relation between cultural diversity and dividend payouts remains.

This chapter relates to three strands of literature. First, it contributes to the dividend policy literature. Prior studies document that dividend policy is closely related to agency problems stemming from country-level factors. For example, La Porta *et al.* (2000) argue that common law countries protect shareholders better than civil law countries. Therefore, agency issues are less severe in common law countries. As evidence, they find that firms in common law countries pay higher dividends than firms in civil law countries. Faccio *et al.* (2001) report that dividend ratios are lower in East Asian markets, where the controlling shareholders are more likely to expropriate minority shareholders than in West European markets. We extend this literature by focusing on national culture to argue that agency problems of multinational firms can be aggravated as cultural exposures are intensified. In particular, we provide a direct test of the extent to which the cultural diversity of a firm affects its dividend payouts.

Second, we contribute to research on the cultural explanation of agency issues for multinationals. Prior studies mainly focus on how cultural differences exacerbate agency conflicts between parent firms and subsidiaries. For example, Roth and O'Donnell (1996) report that the increased agency problems of multinational firms reside in the different cultures of the headquarters and foreign subsidiaries. As cultural distances increase, top managers tend to find it more difficult to objectively and accurately evaluate the performance of subsidiary managers. Further, Moeller and Schlingemann (2005) suggest that agency problems generated in the process of global diversification can be fierce when there are culture clashes between top management and foreign operations. This chapter extends this strand of literature by showing that cultural differences not only intensify agency problems between parent firms and subsidiaries but also aggravate agency problems between outside investors and multinational firms.

Finally, this chapter relates to the literature on the dividend policy of the U.S. multinational firms. A pioneering study investigating dividend policies in the multinational context is Hines (1996), who focuses on the influence of foreign profits on the dividends of U.S. multinational firms in the 1980s and finds that multinationals pay higher dividends than domestic firms. He argues that this is because foreign income resources support multinational firms. However, since the late 1980s, there has been a tendency to pay lower dividends in U.S. firms (Fama & French 2001). Recent studies suggest that while it is true that U.S. multinational firms have broad overseas cash resources, they are more likely to increase cash holdings (Pinkowitz *et al.* 2012; Gu 2017). The fact that higher foreign profits existed alongside with a reduction in total dividend payouts suggest that profitability is not the sole determinant of dividend payouts. This chapter updates the work of Hines (1996) and shows that agency costs, in addition to profitability, are an important determinant of the dividend policy of multinational firms.

The remainder of this chapter is organized as follows. In Section 2, we explain the theoretical connection between cultural diversity and dividend theories and briefly discuss arguments about how a degree of cultural diversity predicts dividend payouts. In Section 3, we construct cultural diversity and detail the sample selection. All of the results are discussed in Section 4. In Section 5, we conclude this chapter.

6.2 Theory and arguments

In the arguments on the effect of cultural diversity that we developed in Chapter 2 the agency argument is closely related to dividend policy. In this section, we discuss in more detail about how agency argument explains the relation between cultural diversity and dividend payouts.

6.2.1 An agency argument of dividend payouts

The agency hypothesis proposes that self-interested managers have incentives to

invest excess cash in activities that provide private benefits. A solution to this problem is to reduce the cash available to managers (Easterbrook 1984; Jensen 1986; La Porta *et al.* 2000; Faccio *et al.* 2001). The basis of the agency argument is that due to incomplete contracting environment and bounded rationality; managers will not always be the perfect agents for shareholders. Different interests between managers and shareholders can create a conflict when there is a large amount of excess cash. In this case, unless profits are paid out to shareholders, managers have an opportunity to hoard excess cash for suboptimal projects or unnecessary perquisites (Stein 2003).

La Porta *et al.* (2000) develop two agency models of dividends regarding investor protection: The outcome and substitute model. Using their approach, we next discuss how these two models explain the relation between cultural diversity and dividend payouts and how each model predicts their relation.

6.2.2 Cultural diversity and dividends under two agency models

Cultural diversity exacerbates the agency problems of multinational firms, this can lead to opposite predictions on the behaviours of corporate dividend payouts. Under the outcome model, dividends are an outcome of an effective legal protection of shareholders. In this case, minority shareholders have greater rights to extract cash from multinational firms. When agency costs become higher, shareholders can activities use legal system to require increase dividends and thus to impede insiders overinvesting or hoarding earnings for the empire building and private benefits. Thus, on the condition that cultural diversity makes monitoring more difficult and costly and reduces the effectiveness of monitoring, shareholders can use legal power to force multinational firms disgorging cash to ensure the increased cultural diversity is in line with shareholders' benefits. Therefore, under the outcome model, cultural diversity is positively related to dividend payouts.

On the other hand, under the substitute model, paying dividend is for the purpose of establishing reputations instead of the outcome of legal force. La Porta *et al.* (2000) argue that in the countries with strong legal protection of shareholders, such as the United State, firms have less need to build reputation through paying dividends. Thus, U.S. multinationals would less concern about paying a lower rate of dividends. Further, La Porta *et al.* (2000) argue that when investors feel protected, they would not be worried about agency problems and willing to accept low dividend payouts. This is particularly the case when the firm has high investment opportunities and need cash for the growth. In this case, if investors interpret that a higher degree of culture diversity as a way to pursue a higher growth potential and are confident that their patience eventually pay off, they would be willing to accept an increased degree of unfamiliarity due to increased cultural differences. Therefore, if the substitute model holds, U.S. multinationals should have significantly lower dividend payouts as the degree of cultural diversity increases.

To summarize, if it is assumed that the substitute model holds, then there will be a negative relation between cultural diversity and dividend ratios. If the outcome model plays a role, then the relation between cultural diversity and dividend ratios should be positive. By distinguishing between the predictions of the substitute and outcome model, we empirically estimate the effect of cultural diversity within a firm on dividend ratios.

6.3 Sample and methodology

In this section, we first describe the sample used in this chapter. Subsequently, we show the method and construct variables for evaluating the effect of cultural diversity on dividend policy.

6.3.1 Sample

The preliminary sample construction process is described in Chapter 3. This chapter excludes firms reporting data with dividend payout amounts larger than sales revenue,

with negative net income before extraordinary items, and with negative cash flows. We focus on firms that have foreign subsidiaries to be in line with prior studies, such as Hines (1996) and La Porta *et al.* (2000). The final sample contains 3,295 multinational firms.³⁴

Table 6-1 provides a sample distribution. It can be seen that the sample patterns in this chapter are fairly close to those of the overall data shown in Chapter 3. Specifically, parent-level statistics show that there is a decrease in the percentage of firms operating in one or two foreign countries, even though they remain the largest portion. The percentage of firms that operate in three to ten foreign countries fluctuate in the range between 32% and 40% over time. In contrast to the two categories mentioned above, there is a clear pattern that firms operating across more than ten nations increase over the sample period. Similar to the data shown in Chapter 3, the subsidiary-level statistics reveal that the percentage of domestic and foreign subsidiaries are more or less the same throughout the sample period — half of the subsidiaries are established domestically, and the other half is incorporated in foreign countries. This result suggests that the increase in firms that operate in more than ten nations mentioned above is not caused by an increase in relative foreign to domestic operations. Further, the statistics from the number of nations (last column of Table 6-1) correspond to the parent-level summary statistics and show that over the sample period, U.S. multinationals tend to operate most often in different countries. These summary statistics suggest that while the degree of foreign operations for U.S. multinational firms relative to their domestic operations does not vary significantly, the dispersion of their foreign operations increase over time, indicating that cultural diversity is also likely to increase.

³⁴ Compared to the sample of Hines (1996) includes 2,800 U.S. multinational firms over the period 1984-1989.

Table 6-1: Sample distribution for dividend policy

Year	Parents				Subsidiaries			Nations
	N	1-2 nation(s)	3-10 nations	>10 nations	N	Domestic	Foreign	N
2004	1,213	43.8%	39.9%	16.3%	32,248	44.5%	55.5%	147
2005	1,422	45.9%	37.5%	16.6%	44,369	47.5%	52.5%	157
2006	1,661	54.0%	32.5%	13.5%	75,263	71.5%	28.5%	161
2007	1,725	50.7%	32.2%	17.1%	53,109	53.1%	46.9%	170
2008	1,721	46.0%	33.6%	20.4%	56,843	51.2%	48.8%	170
2009	1,734	43.8%	35.1%	21.0%	57,386	51.3%	48.7%	165
2010	1,615	42.4%	33.9%	23.7%	56,271	49.2%	50.8%	168
2011	1,611	41.5%	33.6%	25.0%	58,897	49.9%	50.1%	168
2012	1,773	38.1%	35.1%	26.3%	69,041	51.7%	48.3%	175
2013	1,764	38.8%	34.0%	27.7%	70,556	51.6%	48.4%	174

This table reports the number of sample U.S. multinational firms over the 2004-2013 period. “Parents” are U.S. listed firms on the NYSE, NASDAQ and AMEX with the exclusion of cross-listed firms. “Subsidiaries” are firms controlled by the parent firms (at least 50.01% ownership). “Nations” represent the number of countries that the subsidiaries are incorporated. Financial firms (both parent firms and subsidiaries) are excluded from the sample. The final sample includes 3,295 unique parent firms, 182,686 subsidiaries, and 190 nations.

6.3.2 Methodology

To investigate the relation between cultural diversity and dividend ratios, we follow Brockman and Unlu (2009); Chay and Suh (2009) and Gopalan *et al.* (2014) employ Tobit regressions, as dividend policies essentially combine two financial decisions: 1. whether to pay cash dividends or not; and 2. how much should be paid. Specifically, we estimate a Tobit regression as follows:

$$Dividend\ ratios_{i,t} = \begin{cases} Dividend\ ratios_{i,t}^* & \text{if } Dividend\ ratios_{i,t} > 0 \\ 0 & \text{Otherwise} \end{cases} \quad (6A)$$
$$Dividend\ ratios_{i,t} = \alpha + \beta_1 Cultural\ diversity_{i,t} + \beta_2 Controls_{i,t} + \varepsilon_{i,t}$$

where $Dividend\ ratios_{i,t}^*$ is dividend ratios of dividend-paying firm i at the end of calendar year t . The dividend amount is the total cash dividend paid to common and preferred shareholders. To prevent biased results due to accounting practices and manager manipulations, we follow La Porta *et al.* (2000) and Faccio *et al.* (2001) and use five alternative measures of dividend ratios as follows: (1) dividends to earnings (Div/Earn); (2) dividends to operating cash flows (Div/CFO); (3) dividends to net sales (Div/Sales); (4) dividends to total assets (Div/TA); and (5) dividends to market capitalization (Div/Mkcap).

We control for various determinants of dividend payouts documented by prior studies. First, as shown by Fama and French (2001), profitability, investment opportunity, and size are three fundamental characteristics affecting dividend decisions. Fama and French (2001) also suggest that firm leverage, sales and asset growth matter for dividend payout policy. We follow their study and control for these variables. Second, DeAngelo *et al.* (2006) report that the life-cycle of a firm is positively related to the dividend policy of the firm. Specifically, they use the earned/ contributed capital mix as a proxy for the life-cycle and argue that young firms need capital to support their growth and therefore

have lower retained earnings to total equity. We follow this life-cycle theory and control for firm age and the retained earnings to total equity ratio. Third, Chay and Suh (2009) find that cash flow uncertainty has a negative impact on probability and the amount of dividend paid. Following their study, we use annual stock price volatility as a proxy for cash flow uncertainty. Fourth, Gopalan *et al.* (2014) suggest that business diversification is positively related to dividend payouts. They argue that by paying dividends, underfunded business units can be supported by cash-rich business units. Therefore, we control for business diversification. Finally, Faccio *et al.* (2001) report that dividend policy relates to inside shareholdings, we thus control for the percentage of shares held by insiders. The constructions and the sources of the above variables are explained in Appendix.

Summary statistics are shown in Table 6-2. It is worth noting that all dividend measures have median values of zero, suggesting that at least half of our sample firms do not pay dividends. This confirms the rationality of using Tobit regressions to estimate the relation between cultural diversity and payout ratios, as the results are more convincing conditional on the dividend-paying firms. Further, the mean values of Div/Earn, Div/CFO, and Div/Sales are 22.29%, 12.81%, and 1.48%, respectively. These numbers are comparable to La Porta *et al.* (2000) who suggest the dividend ratios in the U.S. are 22.11%, 11.38%, and 0.95%, respectively.

6.4 Result

This section reports the results on the relation between dividend ratios and cultural diversity. The main results are shown first, followed by a range of robustness tests; finally, the results with a consideration of factors regarding global operations are presented.

Table 6-2: Summary statistics of cultural diversity, dividend ratios and controls

	Mean	Standard Deviation	Min	Median	Max	N
Cultural diversity (CD) measures						
CD_Hofstede	3.00	2.56	0.01	2.25	9.54	12,305
CD_GLOBE	2.91	2.40	0.01	2.19	8.84	12,256
CD_Egalitarianism	0.90	0.69	0.00	0.69	2.49	12,249
CD_Individualism	0.66	0.57	0.00	0.52	2.13	12,235
CD_Trust	0.82	0.73	0.00	0.61	2.83	12,235
Dividend ratios						
Div/Earn (%)	22.29	52.66	0.00	0.00	523.09	9,799
IA_Div/Earn (%)	21.18	52.50	-18.84	0.00	523.09	9,799
Div/CFO (%)	12.81	27.34	0.00	0.00	281.58	9,796
IA_Div/CFO (%)	12.07	27.16	-10.45	0.00	281.58	9,796
Div/Sales (%)	1.48	3.08	0.00	0.00	24.33	9,799
IA_Div/Sales (%)	1.42	3.07	-0.57	0.00	24.33	9,799
Div/Assets (%)	1.38	2.74	0.00	0.00	23.70	9,573
IA_Div/Assets (%)	1.30	2.72	-0.87	0.00	23.70	9,573
Div/Mkcap (%)	0.99	2.46	0.00	0.00	31.61	9,759
IA_Div/Mkcap(%)	0.90	2.45	-1.09	0.00	31.61	9,759
Firm-level determinants						
Firm size (ln)	21.09	1.75	16.39	21.05	25.22	8,472
Profitability (%)	11.20	7.10	-24.50	9.96	35.14	8,472
Growth opportunity	0.92	0.68	-1.31	0.87	3.22	8,453
Sales growth (%)	12.31	19.87	-50.18	9.21	152.51	8,358
Assets growth (%)	0.08	0.16	-0.56	0.07	0.60	6,878
Leverage (%)	26.12	24.04	0.00	23.67	108.54	8,475
Firm age	36.00	29.64	0.00	25.00	183.00	8,632
E/C capital mix	0.47	2.60	-29.15	0.61	17.72	8,655
Cash flow volatility (%)	38.35	13.75	14.97	36.64	74.94	17,146
Business diversification	2.96	1.82	1.00	3.00	10.00	8,668
Inside holdings (%)	14.91	16.31	0.07	10.81	72.45	7,997
Country-level and Institutional factors						
Geographical distance_Big	0.12	0.23	0.00	0.03	1.35	12,506
Geographical distance_Cap	0.12	0.24	0.00	0.03	1.38	12,506
Foreign to total sales	30.40	27.65	0.00	25.75	99.92	17,483
Foreign to total income	19.63	26.62	0.00	3.84	95.40	11,341
Incorruptibility_TI	7.06	0.76	0.00	7.25	9.25	12,318
Incorruptibility_World Bank	84.18	8.62	0.00	86.86	99.01	12,318
Incorruptibility_LLSV	0.79	0.10	0.00	0.82	0.99	12,318
Capital controls	0.17	0.08	0.01	0.15	0.55	12,503

This table reports the summary statistics of key variables in the regression analyses. Variables cover a ten-year period from 2004 to 2013. All variables are detailed in Appendix: Variable Description.

6.4.1 Main results

Table 6-3 shows that the coefficients of cultural diversity are negative and significant at the 1% level for all five measures of dividend ratios. The negative and significant coefficients of cultural diversity indicate that multinationals with higher cultural diversity have lower dividend ratios, irrespective of the measure of dividend ratios. As we are using a Tobit model, the magnitudes of cultural diversity coefficients cannot be interpreted directly. Therefore, we also calculate the marginal effects for all five dividend ratios with the standard errors using the delta method (Davidson & MacKinnon 2004).³⁵ Results show that the marginal effects at the mean for the ratios of dividends to earnings, dividends to operating cash flows, dividends to net sales, dividends to total assets, and dividends to market capitalization are -0.75, -0.32, -0.04, -0.03 and -0.02, respectively; and all test statistics remain significant at the 1% level. Given the average earnings, operating cash flows, net sales, total assets and market capitalization for our sample firms are \$0.46 billion, \$0.76 billion, \$5.56 billion, \$5.92 billion, and \$8.24 billion, respectively, these results suggest that the magnitude of decreases in dividend ratios with increases in cultural diversity is also economically significant as. For example, if a firm with positive dividend payments has one unit higher in cultural diversity than the average firms, the firm has a lower dividend payout of around \$340 million from earnings.³⁶ Therefore, the results that managers operating in the environment with greater cultural diversity pay lower dividends provide evidence supporting the substitute model and are inconsistent with the outcome model.

³⁵ The idea is that the coefficients in a Tobit model also include a scale factor that depends on all of the independent variables. By replacing each independent variable with its sample average, we obtain the partial effect through which we can see how the coefficients change from the mean value of each variable. Then, the standard errors are calculated by the delta method using a first-order Taylor expansion, which is a linear approximation to the function of each independent variable about its mean. For a detailed mathematical derivation, see Davidson and MacKinnon (2004).

³⁶ One unit is a conservative estimate, given that the standard deviation is 2.555 units.

Table 6-3: Regressions of dividends on cultural diversity and firm-level determinants

Dependent variables	Div/Earn	Div/CFO	Div/Sales	Div/Assets	Div/Mkcap
Cultural diversity (CD)	-1.694*** (-4.05)	-0.682*** (-3.21)	-0.086*** (-3.51)	-0.054*** (-2.76)	-0.051*** (-4.04)
Firm size	2.839*** (3.30)	0.828** (2.00)	0.440*** (8.10)	0.102** (2.50)	0.131*** (4.80)
Profitability	-0.839*** (-3.66)	0.332*** (3.40)	0.096*** (7.40)	0.120*** (9.70)	0.040*** (6.00)
Investment opportunity	11.930*** (4.60)	5.202*** (4.50)	1.152*** (8.00)	1.070*** (8.90)	0.000 (0.60)
Sales growth	-0.378*** (-3.76)	-0.140*** (-2.98)	-0.025*** (-4.55)	-0.020*** (-4.21)	-0.012*** (-3.11)
Assets growth	-66.702*** (-6.82)	-29.632*** (-6.39)	-3.169*** (-5.96)	-3.429*** (-7.56)	-2.222*** (-6.50)
Leverage	0.024 (0.40)	-0.008 (-0.27)	-0.010*** (-2.72)	-0.007** (-2.55)	0.000 (0.00)
Firm age	0.455*** (11.70)	0.246*** (12.90)	0.021*** (12.40)	0.021*** (13.10)	0.015*** (12.20)
E/C capital mix	0.007 (1.10)	-0.003 (-0.39)	-0.001 (-1.57)	-0.001 (-1.10)	0.0003 (0.80)
Cash flow volatility	-2.646*** (-14.87)	-1.524*** (-15.99)	-0.180*** (-18.34)	-0.152*** (-18.55)	-0.095*** (-14.63)
Business diversification	1.109* (1.80)	0.868*** (3.10)	-0.012 (-0.32)	0.081*** (2.70)	0.064*** (3.50)
Inside holdings	0.442*** (4.95)	0.260*** (5.11)	0.028*** (5.50)	0.025*** (5.45)	0.019*** (5.03)
Intercept	-22.447 (-1.04)	-2.331 (-0.22)	-7.468*** (-5.92)	-1.576 (-1.58)	-1.767** (-2.50)
Year+ Industry FE	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.040	0.050	0.098	0.109	0.107
N	5,936	5,935	5,936	5,936	5,936

This table reports the results of Tobit regressions of dividend ratios on cultural diversity and control variables. Dividend ratios are measured as follows: (1) dividends to earnings (Div/Earn); (2) dividends to operating cash flows (Div/CFO); (3) dividends to net sales (Div/Sales); (4) dividends to total assets (Div/TA); and (5) dividends to market capitalization (Div/Mkcap). Control variables for all regressions include firm size, profitability, investment opportunities, assets growth, sales growth, leverage, firm age, E/C capital mix, cash flow volatility, business diversification and insider holding percentage. The detailed variable descriptions are in Appendix. The period covered is 2004-2013. T-statistics are shown in parentheses. *, ** and *** represent 10%, 5%, and 1% levels of significance, respectively.

The effects of control variables presented in Table 6-3 also meet our expectations. The coefficients on the three determinants documented by Fama and French (2001), firm size, profitability, and investment opportunity are positive and statistically significant, suggesting larger, more profitable firms, and firms that have higher growth potential tend to have higher dividend payouts. In contrast, the negative coefficients on sales growth and asset growth indicate that dividends are less likely to be paid for firms with more investments, as they need short-term funds to support their growth. The results also show that firm leverage does not consistently appear a significant influence on dividend payments. Further, in line with the life-cycle theory of DeAngelo *et al.* (2006), we find that firm age is positively related to dividend ratios at the 1% significance level throughout all measures dividend ratios, suggesting well-established, long-lasting, and mature firms pay more dividends. In addition, the coefficients on cash flow volatility are negatively related to dividend ratios; whereas the coefficients on business diversification and inside holdings are positively related to dividend ratios. These results are in line with Faccio *et al.* (2001), Chay and Suh (2009) and Gopalan *et al.* (2014), suggesting that firms with more uncertainty about future cash flows pay lower dividends, while firms with multiple businesses and with a large proportion of shares held by insiders have higher dividend payouts.

Overall, the results from all five measures of dividend ratio regressions support the substitute instead of the outcome model of dividend policies, suggesting that the managers of multinational firms tend to reduce rather than increase dividends to align interests with shareholders with strong profitability prospects from foreign operations when cultural diversity is high. Thus, the results in this section provide evidence that given strong legal protection for investors in the United States, agency problems caused by a higher cultural diversity are not severe concerns of U.S. multinational shareholders.

6.4.2 Robustness checks

To ensure that our main results are not driven by a specific cultural measure, estimation technique, industry effect and sample selection, we conduct a range of robustness tests.

6.4.2.1 *Alternative measures of culture*

In this section, we use alternative measures of culture to examine the effect of cultural diversity on dividend payout. As described in Chapter 3, our first alternative measure of culture is GLOBE's (2004) cultural framework, and we also use three single dimensions: Schwartz's egalitarianism scores in the year 2005 release of cultural values dataset, and individualism and trust from the World Value Survey.

In Table 6-4, we present our results by using different measures of culture. We find that using these alternative cultural measures does not materially change our main results and that there is a negative effect of cultural diversity on dividend ratios as shown throughout Panel A to E in Table 6-4. In addition, all control variables show the same effects on dividend payouts with our main results (unreported). Overall, the tests in this section confirm that our findings are not biased to the different measures of culture.

6.4.2.2 *Alternative estimation techniques*

One concern with the Tobit model is the issue of selection bias. In this chapter, for instance, it is likely that dividend payments for some firms may not be observed, but they are not zero. If this is the case, then our sample would not be randomly selected and our results, based on only observable data, may be biased. To address this concern, we use the Heckman selection model. This model treats the selection bias as an omitted variable bias and uses a statistically adjusted value (the Inverse Mills ratio) calculated in the selection equation as an independent variable to correct for unobserved representative samples.

Table 6-4: Cultural diversity and dividend ratios -- alternative measures of culture

Dependent variable in each panel				
Model	(1)	(2)	(3)	(4)
Panel A: Dividends to earnings				
CD_ GLOBE	-1.816*** (-4.02)			
CD_ Egalitarianism		-8.201*** (-5.10)		
CD_ Individualism			-10.075*** (-5.31)	
CD_ Trust				-5.854*** (-3.99)
Intercept	-21.391 (-0.99)	-21.464 (-1.01)	-26.337 (-1.24)	-22.074 (-1.02)
Controls & Year +Industrial FE	Yes	Yes	Yes	Yes
Pseudo R ²	0.04	0.04	0.04	0.04
N	5,936	5,936	5,936	5,936
Panel B: Dividends to operating cash flows				
CD_ GLOBE	-0.716*** (-3.15)			
CD_ Egalitarianism		-3.645*** (-4.54)		
CD_ Individualism			-3.822*** (-4.11)	
CD_ Trust				-2.024*** (-2.85)
Intercept	-1.801 (-0.17)	-2.455 (-0.24)	-3.503 (-0.34)	-1.44 (-0.14)
Controls & Year +Industrial FE	Yes	Yes	Yes	Yes
Pseudo R ²	0.05	0.05	0.05	0.05
N	5,935	5,935	5,935	5,935
Panel C: Dividends to sales revenue				
CD_ GLOBE	-0.092*** (-3.56)			
CD_ Egalitarianism		-0.420*** (-4.51)		
CD_ Individualism			-0.414*** (-3.76)	
CD_ Trust				-0.295*** (-3.62)
Intercept	-7.409*** (-5.90)	-7.419*** (-5.94)	-7.499*** (-5.98)	-7.444*** (-5.89)
Controls & Year +Industrial FE	Yes	Yes	Yes	Yes
Pseudo R ²	0.10	0.10	0.10	0.10
N	5,936	5,936	5,936	5,936
Panel D: Dividends to total assets				
CD_ GLOBE	-0.061*** (-2.90)			
CD_ Egalitarianism		-0.341*** (-4.54)		
CD_ Individualism			-0.336*** (-3.85)	
CD_ Trust				-0.159** (-2.50)
Intercept	-1.56 (-1.57)	-1.662* (-1.68)	-1.727* (-1.74)	-1.504 (-1.51)
Controls & Year +Industrial FE	Yes	Yes	Yes	Yes
Pseudo R ²	0.11	0.11	0.11	0.11
N	5,936	5,936	5,936	5,936
Panel E: Dividends to market capitalization				
CD_ GLOBE	-0.053*** (-3.99)			
CD_ Egalitarianism		-0.266*** (-5.60)		
CD_ Individualism			-0.297*** (-5.25)	
CD_ Trust				-0.160*** (-3.82)
Intercept	-1.723** (-2.44)	-1.766** (-2.53)	-1.872*** (-2.66)	-1.718** (-2.43)
Controls & Year +Industrial FE	Yes	Yes	Yes	Yes
Pseudo R ²	0.11	0.11	0.11	0.11
N	5,936	5,936	5,936	5,936

This table reports the results of Tobit regressions of dividend ratios on four alternative measures of cultural diversity and control variables. A detailed variable description is in Appendix. The period covered is 2004-2013. T-statistics are shown in parentheses. *, ** and *** represent 10%, 5%, and 1% levels of significance, respectively.

In Panel A of Table 6-5, we present our results based on the Heckman selection model. The results of these tests are similar to our previous findings, showing that cultural diversity is negatively related to each of the five dividend ratios.

We also use the Fama and MacBeth (1973) procedure to investigate cross-sectional variations in the relation between cultural diversity and dividend ratios. Specifically, we estimate the regression models separately for each of the ten years in our sample and then average the coefficient estimates. Newey and West (1987) heteroscedasticity and autocorrelation consistent estimates of standard errors are used to compute the t-statistics. The results from the Fama-MacBeth regressions, reported in Panel B of Table 6-5, consistently show negative cultural diversity coefficients.³⁷

Although results from both Tobit and the Heckman selection models suggest that the amount of dividends is negatively associated with the degree of cultural diversity if there is a dividend payment, it is also interesting to know whether cultural diversity affects the dividend decision in the first step, i.e. the possibility of paying dividends. This is an important issue, as pointed out by Fama and French (2001) that the propensity to pay dividends is one of the key aspects of dividend policies. Following Fama and French (2001) and Denis and Osobov (2008), we use probit and logit models to conduct this test. Panels C and D of Table 6-5 present our regression results from the logit and probit models, respectively. While the magnitude of the coefficients in the logit model is larger than that in the probit model (-0.06 versus -0.03), the results of marginal effects are fairly close, being -0.0109 and -0.0117, respectively. All of the results are significant at the 1% level, suggesting that cultural diversity not only negatively affects the dividend payment amount but also affects the likelihood of dividend payment.

³⁷ We obtain similar results from other panel data techniques, such as fixed effects and random effects models.

Table 6-5: Cultural diversity and dividend ratios -- alternative techniques

	Cultural diversity	Intercept	Controls	Industry + Year FE	Inverse Mills Ratio	R ² or Seudo R ²	N
Panel A: Heckman selection model							
Div/Earn	-0.955** (-2.20)	71.358*** (3.08)	Yes	Yes	35.126*** (5.01)		5,937
Div/CFO	-0.475** (-2.14)	31.288*** (2.64)	Yes	Yes	24.595*** (6.94)		5,937
Div/Sales	-0.058** (-2.34)	-5.684*** (-4.32)	Yes	Yes	2.639*** (6.69)		5,937
Div/Assets	-0.045** (-2.20)	-0.042 (-0.04)	Yes	Yes	2.871*** (9.07)		5,937
Div/Mkcap	-0.044*** (-3.10)	-0.552 (-0.73)	Yes	Yes	1.944*** (8.66)		5,937
Panel B: Fama-MacBeth approach							
Div/Earn	-0.726*** (-3.54)	56.826*** (6.39)	Yes	Yes		0.147	5,936
Div/CFO	-0.192 (-1.50)	29.628*** (10.56)	Yes	Yes		0.168	5,935
Div/Sales	-0.028* (-2.21)	-1.954*** (-4.65)	Yes	Yes		0.233	5,936
Div/Assets	-0.007 (-0.79)	2.094*** (4.04)	Yes	Yes		0.282	5,936
Div/Mkcap	-0.019** (-3.21)	0.680*** (3.80)	Yes	Yes		0.220	5,936
Panel C: Logit model							
Dividend Payout	-0.057*** (-3.89)	-5.116*** (-8.09)	Yes	Yes		0.358	5,936
Panel D: Probit model							
Dividend Payout	-0.033*** (-3.92)	-2.976*** (-8.14)	Yes	Yes		0.356	5,936

This table reports the results of dividend ratio regressions on four alternative measures of cultural diversity and control variables. A detailed variable description is in Appendix. The period covered is 2004-2013. T-statistics are shown in parentheses. *, ** and *** represent 10%, 5%, and 1% levels of significance, respectively.

6.4.2.3 Further robustness checks

In this section, we conduct a number of robustness checks on the main results presented in Table 6-3. In particular, we try to mitigate the concern that a lower dividend ratio associated with an increased cultural diversity could be driven by (1) industry effects, (2) young firms, (3) small firms, (4) East Asian markets, and (5) civil law domains.

Industry effects may influence dividend payouts because different industries might be at different growth stages and maturity degrees that influence their dividend policies (La Porta *et al.* 2000; Faccio *et al.* 2001). Following La Porta *et al.* (2000), we address this concern by computing industry-adjusted dividend ratios to control for industry effects by subtracting the median of the dividend ratio for sample firms in the same industry, as measured by the primary SIC code. In Panel A of Table 6-6, we use industry-adjusted dividend ratios to control for industry effects and re-estimate the regressions in Table 6-3. The result shows that the industry adjustment does not materially change our main results, the coefficients on cultural diversity remain negative and significant for all five dividend ratio measures.

The evidence that young firms have lower dividend payouts is well-documented in the life-cycle theory of dividends (DeAngelo *et al.* 2006). Hence, we check whether younger firms drive the effect of cultural diversity lowering dividends. To investigate this possibility, Panel B of Table 6-6 removes all firms younger than ten years, which is also the tenth percentile of our sample firms. This requirement forces us to exclude 400 firms. Based on this reduced sample, similar findings are obtained. Hence, the negative relation between cultural diversity and dividend payouts does not seem to be driven by young firms.

We also examine a sample that excludes small firms, since there is a tendency that small firms would be increasingly publicly traded (Fama & French 2001). These firms have lower dividend payouts as they have low earnings and need strong investments. To

Table 6-6: Cultural diversity and dividend ratios -- robustness checks

	IA_Div/Earn	IA_Div/CFO	IA_Div/Sales	IA_Div/Assets	IA_Div/Mkcap
Panel A: Industry adjusted dividend ratios					
Cultural diversity	-1.231*** (-5.66)	-0.386*** (-7.52)	-0.026*** (-9.43)	-0.038*** (-9.14)	-0.039*** (-9.23)
Controls+ Intercept	Yes	Yes	Yes	Yes	Yes
Year +Industrial FE	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.08	0.13	0.27	0.22	0.24
N	5,936	5,936	5,936	5,936	5,936
Panel B: Excluding young firms					
Cultural diversity	-1.580*** (-3.80)	-0.629*** (-2.91)	-0.083*** (-3.34)	-0.048** (-2.42)	-0.048*** (-3.89)
Controls+ Intercept	Yes	Yes	Yes	Yes	Yes
Year +Industrial FE	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.04	0.05	0.10	0.11	0.11
N	5,537	5,536	5,537	5,537	5,537
Panel C: Excluding small firms					
Cultural diversity	-1.434*** (-3.52)	-0.514*** (-2.63)	-0.063*** (-2.63)	-0.029 (-1.61)	-0.040*** (-3.28)
Controls+ Intercept	Yes	Yes	Yes	Yes	Yes
Year +Industrial FE	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.04	0.05	0.10	0.12	0.11
N	5,517	5,516	5,517	5,517	5,517
Panel D: Excluding firms operating in Asian countries					
Cultural diversity	-1.909 (-1.40)	-1.098* (-1.67)	-0.119* (-1.65)	-0.106* (-1.74)	-0.068* (-1.68)
Controls+ Intercept	Yes	Yes	Yes	Yes	Yes
Year +Industrial FE	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.04	0.04	0.09	0.10	0.10
N	2,823	2,822	2,823	2,823	2,823
Panel E: Firms with at least 85% subsidiaries operating in common law countries					
Cultural diversity	-5.154* (-1.96)	-2.588** (-2.35)	-0.301** (-2.06)	-0.217* (-1.72)	-0.134* (-1.72)
Controls+ Intercept	Yes	Yes	Yes	Yes	Yes
Year +Industrial FE	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.03	0.04	0.08	0.08	0.09
N	2,092	1,690	1,690	1,690	1,690

This table reports the results of Tobit regressions of dividend ratios on four alternative measures of cultural diversity and control variables, after applying industry adjustment and various data screens. We adjust the industry effect by subtracting the median of the dividend ratio for sample firms in the same industry, as measured by the primary SIC code. A detailed variable description is in Appendix. The period covered is 2004-2013. T-statistics are shown in parentheses. *, ** and *** represent 10%, 5%, and 1% levels of significance, respectively.

check that whether small firms drive the negative effects of cultural diversity, we exclude all firms with less than a tenth percentile of our sample, which is around \$140 million in total assets. Panel C of Table 6-6 shows that while this exclusion decreases statistical significance, the negative relation between cultural diversity and dividend ratios remains, and the coefficients of cultural diversity are significant in all but one specification. Therefore, our results are robust to the exclusion of small firms.

Faccio *et al.* (2001) find that East Asian firms pay lower dividends. One concern is that this phenomenon may affect our results and so we replicate our tests on sample firms that do not have subsidiaries in East Asian markets.³⁸ However, it is worth noting that this exclusion not only significantly reduces sample size (by almost half), but also dramatically reduces the degree of cultural distance and therefore cultural diversity. Even so, the results in Panel D of Table 6-6 show that there is a consistent and negative effect of cultural diversity on dividend ratios; and the effect is significant in four out of five regressions. These results provide evidence that East Asian countries do not drive the lower dividend payouts associated with cultural diversity.

Finally, our sample of multinational firms pervasively operate in civil law countries. La Porta *et al.* (2000) show that firms in civil law countries pay lower dividends than firms in common law countries. For this reason, we replicate our tests on a sample that has at least 85% operation in common law domains.³⁹ This exclusion offers us a sample of firms that predominantly operate in common law countries, such as the United Kingdom, Canada, Australia, and New Zealand. Apparently, the construction of this subsample simultaneously leads to a greater decrease in cultural distance. Nevertheless,

³⁸ These countries or markets include Brunei Darussalam, Cambodia, China, Hong Kong, Indonesia, Japan, Korea, Laos, Macao, Malaysia, Mongolia, Myanmar, Papua New Guinea, Philippines, Singapore, Taiwan, Thailand, and Vietnam.

³⁹ We are not able to exclude all the firms as long as they have operations in civil law countries, because the vast majority U.S. multinational firms have operations in civil law domains, in particular in Europe and Latin America. Excluding these firms would cause to end up with only a few firms in our tests.

as we show in Panel E of Table 6-6, among these firms the negative effect of cultural diversity is robust and statistically significant. Therefore, we conclude that the negative effect of cultural diversity on dividend policy is robust and not caused by a number of alternative explanations.

6.4.3 Global operations, cultural diversity and dividend payouts

Although there is no consensus on the determinants of dividend policy in international operations, existing research suggests that dividend payouts are related to geographical distance (John *et al.* 2011), the degree of foreign operations (Hines 1996), and the quality of foreign governments (Pinkowitz *et al.* 2006). In this section, we investigate whether these factors affect the relation between cultural diversity and dividend ratios.

6.4.3.1 Cultural diversity and geographical distances

In a study focusing on the U.S, John *et al.* (2011) document that geographical distance is positively associated with dividend payout ratios. They argue that greater geographical distance increases monitoring costs and agency conflicts. By paying higher dividends, the agency problems caused by greater geographical distance can be mitigated. As the geographical distances in their study are calculated between U.S. cities, their measure of geographical distance does not interact with national cultural differences. However, in international operations geographical distance is unavoidably entangled with cultural diversity. Therefore, there may be a concern that the negative effect of cultural diversity on dividend ratios documented in the previous section can be offset by the positive relation between geographical distance and dividend ratios documented by John *et al.* (2011).

In Table 6-7, we re-examine Equation (6A) with the introduction of geographical distance, measured as the distances between the biggest cities of two countries and

Table 6-7: The effect of geographical distance on the cultural diversity and dividend ratio relation

Dependent variable	Div/Earn		Div/CFO		Div/Sales		Div/Assets		Div/Mkcap	
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Geographical distance (GD)_Big city	4.098 (0.94)		4.883** (2.19)		0.965*** (3.43)		0.765*** (3.50)		0.439*** (3.17)	
Geographical distance (GD)_Capital		3.72 (0.87)		4.623** (2.12)		0.927*** (3.37)		0.729*** (3.41)		0.417*** (3.08)
Cultural diversity (CD)	-1.986*** (-3.52)	-1.965*** (-3.48)	-1.030*** (-3.40)	-1.019*** (-3.37)	-0.155*** (-4.45)	-0.154*** (-4.42)	-0.108*** (-3.66)	-0.107*** (-3.61)	-0.082*** (-4.55)	-0.082*** (-4.50)
Intercept	-18.807 (-0.84)	-19.064 (-0.85)	2.021 (0.19)	1.887 (0.17)	-6.596*** (-5.07)	-6.611*** (-5.08)	-0.889 (-0.85)	-0.905 (-0.87)	-1.375* (-1.86)	-1.386* (-1.88)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year + Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.04	0.04	0.05	0.05	0.10	0.10	0.11	0.11	0.11	0.11
N	5,936	5,936	5,935	5,935	5,936	5,936	5,936	5,936	5,936	5,936

This table reports the effect of geographical distance on the relation between cultural diversity and dividend ratios. Geographical distance is measured as country distance between the biggest cities and between the capital cities, respectively. Data for geographical distance are obtained from the Centre d'Études Prospectives et d'Informations Internationales (CEPII). A detailed variable description is in Appendix. The period covered is 2004-2013. T-statistics are shown in parentheses. *, ** and *** represent 10%, 5%, and 1% levels of significance, respectively.

between the capital cities of two countries, in addition to all of the control variables used in the previous section.⁴⁰ The results show that in eight out of ten regressions, geographical distance is positively related to dividend ratios including cultural diversity. These results are in line with John *et al.* (2011), who find the geographical distances within a single national culture, i.e. the United States (which equals to controlling for cultural diversity) stimulate dividend payments. More important, even after considering the potential offsetting effect of geographical diversity, cultural diversity has a negative effect on dividend ratios in all of the regressions. These results suggest that in an international environment, cultural diversity plays a standalone role determining dividend payouts in addition to geographical distance.

6.4.3.2 *Cultural diversity and the degree of foreign operations*

The evidence from Hines (1996) suggests that a degree of foreign operations is positively related to dividend payments. They argue that this is because foreign operations provide U.S. firms with more earnings resources, which support higher dividend payments. If this is the case, then the negative effect of cultural diversity on dividend payouts can be offset by an increase in the degree of foreign operations. To address this concern, Table 6-8 re-examines our models by including two measures of foreign operating earnings: foreign sales to total sales (FSTS) and foreign income to total net income (FITI) in the regression, in addition to cultural diversity. Then, we run regressions for each of the five measures of dividend ratios.

The results in Table 6-8 suggest that there is some evidence supporting the argument of Hines (1996). That is, a higher degree of foreign operations promotes a firm to pay dividends. For example, the result from the regression using FSTS and dividends to sales (model 5) show a significant and positive relation between the degree of foreign

⁴⁰ Data for geographical distances are obtained from the Centre d'Études Prospectives et d'Informations Internationales (CEPII).

Table 6-8: The effect of foreign operations on the cultural diversity and dividend ratio relation

Dependent variable	Div/Earn		Div/CFO		Div/Sales		Div/Assets		Div/Mkcap	
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Foreign to total sales (FSTS)	-0.03 (-0.53)		0.000 (-0.01)		0.009*** (2.65)		0.001 (0.44)		-0.0001 (-0.11)	
Foreign to total incomes (FITI)		-0.067 (-1.40)		-0.010 (-0.40)		-0.001 (-0.22)		-0.001 (-0.52)		-0.0004 (-0.22)
Cultural diversity (CD)	-1.379*** (-2.82)	-1.802*** (-4.06)	-0.574** (-2.47)	-0.774*** (-3.05)	-0.111*** (-3.88)	-0.105*** (-3.40)	-0.051** (-2.25)	-0.067*** (-2.65)	-0.043*** (-3.14)	-0.054*** (-3.74)
Intercept	-28.769 (-1.30)	-61.274*** (-2.98)	-5.538 (-0.51)	-29.438** (-2.54)	-7.236*** (-5.55)	-9.821*** (-6.69)	-1.702* (-1.65)	-3.273*** (-2.83)	-1.049* (-1.70)	-1.058* (-1.72)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.04	0.04	0.05	0.05	0.10	0.10	0.11	0.11	0.11	0.11
N	5,630	4,020	5,629	4,020	5,630	4,020	5,630	4,020	5,630	4,020

This table reports the effect of foreign operations on the relation between cultural diversity and dividend ratios. Foreign operations are measured as foreign to total net sales (FSTS) and foreign to total net income (FITI), respectively. A detailed variable description is in Appendix. The period covered is 2004-2013. T-statistics are shown in parentheses. *, ** and *** represent 10%, 5%, and 1% levels of significance, respectively.

operations and dividend payouts. However, this positive and significant effect of foreign operations on dividend payouts is not consistent over all the regressions. Nine out of the ten regressions provide insignificant coefficients. The possible reason for the difference between our results with Hines (1996) could be that there was a secular decrease in dividend payouts in recent years (Fama & French 2001; Hoberg & Prabhala 2009). Nevertheless, the negative effect of cultural diversity on dividend payouts is not affected after controlling for foreign operations.

6.4.3.3 *Cultural diversity and the quality of foreign governments*

The quality of government may affect the relation between cultural diversity and dividend ratios. As suggested by Pinkowitz *et al.* (2006), when the quality of a foreign government is low, holding cash cannot add much value to a firm; therefore, it is better for the firm to pay dividends. In contrast, cash holdings are more valuable in countries with higher government quality, and thus dividend payments in these countries would be lower. Their findings support this argument and show that there is a negative relation between government quality and dividend payouts. One concern of our study regarding their findings is that if the effect of foreign government quality dominates the dividend policy of multinational firms, then the negative effect of cultural diversity would reflect these effects of formal institutions.

To address this concern, in Table 6-9 we use the degree of incorruptibility as a measure of government quality. To make sure our result is unbiased to a specific measure of incorruptibility, we use three measures of incorruptibility, based on (1) the corruption perceptions index of the Transparency International (Incorruptibility_TI);⁴¹ (2) data from

⁴¹ The corruption perceptions index of Transparency International currently ranks 176 countries on a scale from 100 (very clean) to 0 (highly corrupt). <http://www.transparency.org>.

Table 6-9: The effect of foreign government quality on the cultural diversity and dividend ratio relation

Model	Dependent variable in each panel			
	(1)	(2)	(3)	(4)
Panel A: Dividends to earnings				
Incorruptibility_ TI	-5.824*** (-3.55)			
Incorruptibility_ World Bank		-0.428*** (-2.85)		
Incorruptibility_ LLSV			-19.951*** (-4.97)	
Capital control				76.365*** (4.46)
Cultural diversity	-2.453*** (-5.06)	-2.396*** (-4.79)	-3.261*** (-5.99)	-2.807*** (-5.42)
Intercept + Controls & Year + Industry FE	Yes	Yes	Yes	Yes
Pseudo R ²	0.04	0.04	0.04	0.04
N	5,936	5,936	5,936	5,936
Panel B: Dividends to operating cash flows				
Incorruptibility_ TI	-3.930*** (-4.61)			
Incorruptibility_ World bank		-0.299*** (-3.93)		
Incorruptibility_ LLSV			-11.805*** (-5.57)	
Capital control				38.710*** (4.82)
Cultural diversity	-1.194*** (-4.80)	-1.172*** (-4.58)	-1.609*** (-5.72)	-1.247*** (-4.90)
Intercept + Controls & Year + Industry FE	Yes	Yes	Yes	Yes
Pseudo R ²	0.05	0.05	0.05	0.05
N	5,935	5,935	5,935	5,935
Panel C: Dividends to sales				
Incorruptibility_ TI	-0.414*** (-3.99)			
Incorruptibility_ World bank		-0.035*** (-3.55)		
Incorruptibility_ LLSV			-1.202*** (-4.71)	
Capital control				3.208*** (3.26)
Cultural diversity	-0.140*** (-4.74)	-0.143*** (-4.65)	-0.180*** (-5.40)	-0.133*** (-4.32)
Intercept + Controls & Year + Industry FE	Yes	Yes	Yes	Yes
Pseudo R ²	0.10	0.10	0.10	0.10
N	5,936	5,936	5,936	5,936
Panel D: Dividends to total assets				
Incorruptibility_ TI	-0.454*** (-5.56)			
Incorruptibility_ World bank		-0.037*** (-4.95)		
Incorruptibility_ LLSV			-1.319*** (-6.57)	
Capital control				4.330*** (5.39)
Cultural diversity	-0.113*** (-4.82)	-0.115*** (-4.73)	-0.157*** (-5.97)	-0.117*** (-4.80)
Intercept + Controls & Year + Industry FE	Yes	Yes	Yes	Yes
Pseudo R ²	0.11	0.11	0.11	0.11
N	5,936	5,936	5,936	5,936
Panel E: Dividends to market capitalization				
Incorruptibility_ TI	-0.282*** (-5.20)			
Incorruptibility_ World bank		-0.022*** (-4.48)		
Incorruptibility_ LLSV			-0.811*** (-6.06)	
Capital control				2.522*** (4.73)
Cultural diversity	-0.088*** (-5.78)	-0.088*** (-5.55)	-0.115*** (-6.66)	-0.088*** (-5.46)
Controls & Year + Industry FE	Yes	Yes	Yes	Yes
Pseudo R ²	0.11	0.11	0.11	0.11
N	5,936	5,936	5,936	5,936

This table reports the effect of the quality of foreign government on the relation between cultural diversity and dividend ratios. The quality of foreign government is measured by: (1) the corruption perceptions index of Transparency International (Incorruptibility_TI); (2) the data from the World Bank (Incorruptibility_World Bank); and (3) the data from La Porta *et al.* (1999) and La Porta *et al.* (2008) (Incorruptibility_LLSV). We also use the degree of capital control as another measure of government quality, with the data obtained from Fernández *et al.* (2016). A detailed variable description is in Appendix. T-statistics are shown in parentheses. *, ** and *** represent 10%, 5%, and 1% levels of significance, respectively.

the World Bank (Incorruptibility_World Bank),⁴² and (3) data from La Porta *et al.* (1999) and La Porta *et al.* (2008) (Incorruptibility_LLSV).⁴³ Further, we use the degree of capital control as another measure of government quality, with the data obtained from Fernández *et al.* (2016). All of these measures are weighted averages at the firm level; the weight is the number of subsidiaries in a given country to the total number of firm subsidiaries.

In Table 6-9 we provide the results of these tests. As can be seen, the results are in line with Pinkowitz *et al.* (2006) that the dividend ratios are negatively related to Desai *et al.* (2006), who find subsidiaries in countries imposing capital controls have a stronger tendency than other subsidiaries to remit dividends back to parent companies. This can promote a firm's total dividend payouts. Nevertheless, these results do not diminish the negative relation between cultural diversity and dividend ratios. In all regressions, the negative effect of cultural diversity is significant. Overall, the results in this section suggest that cultural diversity has a unique influence on the dividend policies of multinational firms; this influence is not affected by an inclusion of other factors concerning international operations

6.5 Conclusion

In Chapter 6, we investigate the relation between cultural diversity and the dividend policies of U.S. multinational firms. Specifically, we empirically examine the effect of cultural diversity in the context of the outcome and substitute model. Cultural diversity aggravates the agency problems of multinational firms; therefore, if this is not a concern to shareholders of U.S. multinationals, cultural diversity would be negatively related to

⁴² We use Control of Corruption index from the Worldwide Governance Indicators, which covers 215 countries and territories over the period 1996-2015. <http://data.worldbank.org/data-catalog/worldwide-governance-indicators>.

⁴³ La Porta *et al.* (1999) cover the period 1982-1995 and La Porta *et al.* (2008) cover the period 1996-2000. We standardized the data to be bounded between zero and one.

dividend ratios. On the other hand, if multinational firms are forced to pay dividends when cultural diversity and therefore agency costs are high, then there will be a positive relation between cultural diversity and dividend payouts.

Our results show that the effect of cultural diversity on dividend ratios is negative and significant, even after the control for the determinants of dividend decisions documented in prior research. These results suggest that the higher the cultural diversity, the lower the dividend payouts. The negative effect of cultural diversity is robust to alternative cultural measures and alternative estimation techniques. Further, the negative effect of cultural diversity holds when we use industry-adjusted dividend ratios, a subsample that excludes young firms, a subsample that excludes small firms, a subsample that only includes firms operating outside of the East-Asian countries, and a subsample that only includes firms operating in common law countries.

We also show that the effect of cultural diversity is not altered by the inclusion of relevant factors documented in prior studies that may be associated with dividend decisions in international operations. Specifically, we find that the addition of geographical distance, the degree of foreign operations, and the quality of foreign governments have a positive, an insignificant, and a negative effect on dividend ratios, respectively. However, the addition of these factors does not dampen the negative effect of cultural diversity on the dividend payouts of multinational firms. Therefore, we provide evidence that supports the substitute agency model in that as protected by a strong legal system, investors of U.S. multinationals with a higher degree of cultural diversity are less concerned about agency problems and therefore willing to accept a lower dividend payout

Chapter 7 Conclusion and Discussion

This thesis examines how cultural diversity within multinational firms influences three key corporate financial aspects: firm value, capital structure, and dividend policy. Existing studies document that multinational firms are significantly different from domestic firms in these three areas - they are not only influenced by firm characteristics but also congenitally exposed to national cultural differences. During the process of overseas expansion, multinational firms establish operations in different countries and economies where national cultures vary from one another. Hofstede (2001) suggests that the best practice for multinational management is to fit with local cultures. Consequently, cultural diversity can significantly influence the financial outcomes, activities and policies of multinational firms (Gómez-Mejia & Palich 1997; Palich & Gomez-Mejia 1999).

Before the empirical analyses of these influences are conducted, Chapter 2 discusses the theoretical foundations and provides background information regarding cultural studies. Given that there is abundant evidence of culture influencing financial activities, Chapter 2 looks into the mechanisms through which cultural traits and distances affect financial activities and outcomes. Further, while prior studies document that financial activities of multinational firms inherently are different from that of purely domestic firms, ways in which cultural diversity affects the financial aspects of multinational firms have not yet been systematically examined. After identifying this research gap, Chapter 2 continues by discussing the effect of cultural diversity on multinational firms and developing arguments about the channels through which cultural diversity can take effect. These channels include integration difficulties, firm complexity, information asymmetry, and agency problems.

To examine the effect of cultural diversity, Chapter 3 presents the sample and constructs a measure of cultural diversity within the U.S. multinational firms. Specifically, Chapter 3 starts by reviewing the ways used to capture culture in the literature, followed by discussing and justifying the measures of culture used in this thesis. That is, Hofstede's cultural framework is used as the main measure of culture, and GLOBE's framework, egalitarianism, individualism and trust are used as alternatives. Based on these cultural measures, Chapter 3 further develops a novel entropy measure of cultural diversity. Finally, Chapter 3 discusses the selection of a sample of U.S. listed firms and exhibits the distribution and summary statistics of cultural diversity based on this sample.

From Chapter 4 to 6, this thesis conducts empirical analyses on the influence of cultural diversity on multinational enterprises by focusing on the aforementioned three specific and important finance areas – firm value, capital structure and dividend policy. In Chapter 4, this thesis examines the impact of cultural diversity on the value of multinational firms. Firm value is the core issue of corporate finance as maximizing shareholder value is the modern firms' ultimate goal that aligning the interests of shareholders and managers (Jensen & Meckling 1976). Chapter 4 argues that because cultural diversity increases agency problems and information asymmetry, and reduces investment efficiency, the costs and frictions associated with cultural diversity outweigh the benefits. The results support this argument and show that there is a negative relation between cultural diversity and firm value.

In Chapter 5, this thesis examines the impact of cultural diversity on the capital structures of multinational firms. Capital structure and its determinants are another important issue in corporate finance and is closely related to firm value. Chapter 5 argues cultural diversity is associated with agency costs, information asymmetry and international investment uncertainty, these factors are found to have effects on capital structures. Supporting this argument, the results show that cultural diversity is negatively

related to book and market leverage ratios. The results make an important complement to Desai *et al.* (2008) and we document that formal and informal institutions are both important for determining leverage ratios in a multinational setting. Moreover, Chapter 5 finds that lower leverage ratios associated with higher degrees of cultural diversity are mainly caused by equity issuance rather than debt reduction. These results are in line with Myers (2000) and Vijh (2006) who find that firms with complicated parent-subsidiary structures tend to issue equity.

In Chapter 6, this thesis investigates the relation between cultural diversity and the dividend policies of U.S. multinational firms. Dividend policy is another important corporate finance topic in parallel to capital structure (Jalilvand & Harris 1984). Specifically, Chapter 6 empirically examines the effect of cultural diversity in the context of the two agency models: the outcome and substitute model, as cultural diversity is closely related to agency issues. The results show that the effects of cultural diversity on dividend ratios are negative and significant. Therefore, Chapter 6 provides evidence that supports the substitute model that shareholders of U.S. multinational firms are concerned less with agency problems due to cultural diversity and willing to accept a lower dividend payout ratio thanks to strong legal protection of shareholders in the United States.

To summarize, this thesis documents the significant and distinct impact of cultural diversity on multinational finance and provides answers several important questions that have not been explored in the area of culture and finance. For example, why cultural diversity differs in a substantive way from other measures of diversity, i.e., business and geographic diversity? Admittedly, all three measures of corporate diversity increase firm complexity, monitoring difficulty and therefore agency costs. However, cultural diversity differs from the other two forms of diversity in at least three aspects. First, business diversification reduces firm value mainly because increased resources and opportunities lead to investment inefficiencies (Lang & Stulz 1994; Berger & Ofek 1995; Rajan *et al.*

2000). Whereas, cultural diversity leads to asset allocation inefficiencies because a firm may underinvest profitable but culturally unfamiliar subsidiaries and overinvest less profitable but culturally similar subsidiaries (Dellestrand & Kappen 2012). Second, geographical diversification reduces firm value mainly because increased information asymmetry impedes managers and investors responding timely to value-relevant information (Landier *et al.* 2009; Bernile *et al.* 2015). Whereas, cultural diversity lead to information asymmetry because the ways of information transfer and interpretation are different across cultures. This can make a firm more obscure to investors (Aabo *et al.* 2015; Huang 2015). Finally, cultural diversity increases integration difficulties as it requires integrating people with different values, norms and beliefs (Moeller & Schlingemann 2005; Ahern *et al.* 2015). Integration difficulties are special challenges in cultural diversity and not in business or geographical diversification.

Another important question is that what would constitute the motivation for firms to engage in cultural diversity if such actions lead to overall value depreciation? Indeed, prior studies document that international diversification allows a firm to exploit market imperfection (Errunza & Senbet 1981, 1984) and increase investor recognition (Agmon & Lessard 1977). These benefits provide the firm with the competitive advantage over purely domestic firm. However, international diversification also gives rise to frictions and challenges to the firm in terms of increased risk (Fatemi 1984) and costs (Denis *et al.* 2002) and cultural diversity is such a challenge (Gómez-Mejia & Palich 1997; Palich & Gomez-Mejia 1999). As we argued in the thesis, cultural diversity is associated with several frictions. Therefore, while international diversification can overall increase firm performance, cultural diversity brings costs that marginally reduce firm performance.

In essence, this thesis emphasises the importance of cultural diversity within firms. Studies in this field are critical because, under the current trend of global integration, it is unavoidable to tackle the issues regarding different national cultures. As pointed out by

Hofstede (2001), there is no single structural principle to fit all cultures and the cultural integration process must be consistently managed. Further, unlike universal values and personalities that are inherited, culture is acquired through learning. Therefore, same with all learning process, acquiring cultural knowledge requires a great deal of time, effort, and cost. Given that education in technology and business has been widely promoted nowadays, the advantage and competitiveness of a business in the world significantly depends on cross-cultural understanding (Hofstede 2001).

Provided that recent improvements in transportation and technology makes it less costly to do business overseas and easier to adopt global diversification strategies, firms are expected to keep expanding operations in culturally diversified markets. Therefore, understanding the effects of cultural diversity on financial activities and outcomes is key to understanding global diversification. To this end, the topics covered in this thesis are not only important to scholars by adding knowledge to the literature, but also matters for managers of multinational firms to make more efficient financial decisions on overseas expansions and for investors to have more rational valuations on multinational firms.

Appendix: Variable Description

Variables	Description
	Cultural diversity
Cultural Diversity (CD)	<p>$Cultural\ Diversity_{it} = \sum_{j=1}^J Distance_{US,j} * N_{ijt} \ln(1/N_{ijt})$, where N_{ijt} is the proportion of firm i's subsidiaries incorporated in country j to the total number of firm i's subsidiaries at year t, $Distance_{US,j}$ is cultural distance between the United States, the home country of the sample firms and country j, the country where firm i's subsidiary is incorporated. $Distance_{US,j}$ is computed using a Euclidean version of Kogut and Singh's (1988) formula that is based on Hofstede's cultural dimensions, including power distance index (PDI), uncertainty avoidance index (UAI), individualism index (IDV), masculinity index (MAS), long-term orientation (LTO), and Indulgence (IND). Source: Hofstede (1980, 2001, 2011), the Hofstede Centre (https://geert-hofstede.com), and Geert Hofstede's academic website (http://www.geerthofstede.nl).</p>
CD_ GLOBE	<p>$Cultural\ Diversity_{it} = \sum_{j=1}^J Distance_{US,j} * N_{ijt} \ln(1/N_{ijt})$, where N_{ijt} is the proportion of firm i's subsidiaries incorporated in country j to the total number of firm i's subsidiaries at year t, $Distance_{US,j}$ is cultural distance between the United States, the home country of the sample firms and country j, the country where firm i's subsidiary is incorporated. $Distance_{US,j}$ is computed using a Euclidean version of Kogut and Singh's (1988) formula that is based on the GLOBE's (House <i>et al.</i> 2004) cultural framework value dimensions. Source: The GLOBE project (House <i>et al.</i> 2004).</p>
CD_ Egalitarianism	<p>$Cultural\ Diversity_{it} = \sum_{j=1}^J Distance_{US,j} * N_{ijt} \ln(1/N_{ijt})$, where N_{ijt} is the proportion of firm i's subsidiaries incorporated in country j to the total number of firm i's subsidiaries at year t, $Distance_{US,j}$ is cultural distance between the United States, the home country of the sample firms and country j, the country where firm i's subsidiary is incorporated. $Distance_{US,j}$ is computed using a Euclidean version of Kogut and Singh's (1988) formula that is based on the Schwartz's egalitarianism scores in the year 2005 release of cultural values dataset. Source: Schwartz's egalitarianism scores in the year 2005 release of cultural values dataset (Siegel <i>et al.</i> 2011).</p>
CD_ Individualism	<p>$Cultural\ Diversity_{it} = \sum_{j=1}^J Distance_{US,j} * N_{ijt} \ln(1/N_{ijt})$, where N_{ijt} is the proportion of firm i's subsidiaries incorporated in country j to the total number of firm i's subsidiaries at year t, $Distance_{US,j}$ is cultural distance between the United States, the home country of the sample firms and country j, the country where firm i's subsidiary is incorporated. $Distance_{US,j}$ is computed using a Euclidean version of Kogut and Singh's (1988) formula that is based on the World Value Survey question, "Incomes should be made more equal" versus "We need larger income differences as incentives for individual effort". We normalize the average answer to the questions to be bounded between zero and one for the countries in the sample. Source: World Value Survey.</p>
CD_ Trust	<p>$Cultural\ Diversity_{it} = \sum_{j=1}^J Distance_{US,j} * N_{ijt} \ln(1/N_{ijt})$, where N_{ijt} is the proportion of firm i's subsidiaries incorporated in country j to the total number of firm i's subsidiaries at year t, $Distance_{US,j}$ is cultural distance between the United States, the home country of the sample firms and country j, the country where firm i's subsidiary is incorporated. $Distance_{US,j}$ is computed using</p>

	a Euclidean version of Kogut and Singh's (1988) formula that is based on the World Value Survey question, " <i>Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?</i> ". We normalize the average answer to the questions to be bounded between zero and one for the countries in the sample. Source: World Value Survey.
Firm value	
Tobin's Q	The ratio of the market value of assets to the replacement value of assets at the end of the calendar year. Source: Datastream.
Market value of capital/Total assets (MC/TA)	The ratio of the market value of equity plus book value of debt to the book value of total assets at the end of the calendar year. Source: Datastream.
Enterprise value/Total assets (EV/TA)	The ratio of the enterprise value to the book value of total assets. Enterprise value is calculated as the market value of common equity plus debt, minority interest and preferred shares, minus total cash and cash equivalents at the end of the calendar year. Source: Datastream.
Capital structure	
Book leverage ratio	Book leverage ratio. Source: Datastream.
Market leverage ratio	Market leverage ratio. Source: Datastream.
Net equity issuance	Net equity issuance. Source: Worldscope.
Net debt issuance	Net debt issuance. Source: Worldscope.
Dividend ratios	
Div/Earn	The ratio of dividends to earnings. Dividends are total cash dividends paid to common and preferred shareholders. Earnings are measured after taxes and interest but before extraordinary items. Source: Datastream.
IA_ Div/Earn	Industry adjusted dividend-to-earnings ratio. We calculate IA_ Div/Earn as the difference between a firm's Div/Earn and the firm's industry median Div/Earn. The industry is defined according to the firm's primary SIC. Source: Datastream.
Div/CFO	The ratio of dividends to operating cash flow. Dividends are total cash dividends paid to common and preferred shareholders. Operating cash flow is total funds from operations net of noncash items from discontinued operations. Source: Datastream.
IA_ Div/CFO	Industry adjusted dividend-to-operating cash flow ratio. We calculate IA_ Div/CFO as the difference between a firm's Div/CFO and the firm's industry median Div/CFO. The industry is defined according to the firm's primary SIC. Source: Datastream.
Div/Sales	The ratio of dividends to sales. Dividends are total cash dividends paid to common and preferred shareholders. Sales are net sales. Source: Datastream.
IA_ Div/Sales	Industry adjusted dividend-to-sales ratio. We calculate IA_ Div/Sales as the difference between a firm's Div/Sales and the firm's industry median Div/Sales. The industry is defined according to the firm's primary SIC. Source: Datastream.
Div/Assets	The ratio of dividends to total assets. Dividends are total cash dividends paid to common and preferred shareholders. Total assets is the book value of total assets. Source: Datastream.
IA_ Div/Assets	Industry adjusted dividend-to-assets ratio. We calculate IA_ Div/Assets as the difference between a firm's Div/Assets and the firm's industry median Div/Assets. The industry is defined according to the firm's primary SIC. Source: Datastream.
Div/Mkcap	The ratio of dividends to market capitalization. Dividends are total cash dividends paid to common and preferred shareholders. The market capitalization equals total market value of common and preferred stocks. Source: Datastream.
IA_ Div/Mkcap	Industry adjusted dividend-to-market-capitalization ratio. We calculate IA_ Div/ Mkcap as the difference between a firm's Div/ Mkcap and the firm's industry median Div/ Mkcap. The industry is defined according to the firm's primary SIC. Source: Datastream.

Chapter 1 control variables	
Firm size	The natural logarithm of total market capitalization.
Leverage (Equity multiplier)	The book value of total assets to the book value of total shareholders' equity. Source: Datastream.
Operating revenue/Sales	The ratio of the operating revenue to the total sales revenue. The operating revenue is the difference between total sales revenue and total operating expenses. Source: Datastream.
Capital expenditure /Sales	The ratio of the capital expenditure to the total sales revenue. Capital expenditure is the funds used to acquire fixed assets other than those associated with acquisitions. Source: Datastream.
Intangible/Sales	The ratio of the amortization of intangible assets to the total sales revenue. Amortization of intangible assets includes the cost allocation for goodwill, research and development, patents and leasehold improvements, trademarks, bookplates, tools and film costs. Source: Datastream.
Geographical diversity	$Geographic\ Diversity_i = \sum_{j=1}^J Geographic\ Distance_{US,j} * N_j \ln(1/N_j)$, where N_j is the proportion of firm i 's subsidiaries incorporated in country j to the total number of firm i 's subsidiaries, $Geographic\ Distance_{US,j}$ is geographical distance between the United States and the biggest city of country j . Source: The Centre d'Études Prospectives et d'Informations Internationales (CEPII).
Industrial diversification	Number of business segments. Source: Datastream.
Free trade agreement	The percentage of subsidiaries incorporated in the countries that have free trade agreements with the United States. Source: United States Trade Representative.
Tax treaty	The percentage of subsidiaries incorporated in the countries that have tax treaty with the United States. Source: The Internal Revenue Service.
Investment treaty	The percentage of subsidiaries incorporated in the countries that have free trade agreements with the United States. Source: U.S. Department of States and United States Trade Representative.
Growth rate volatility	Variances of GDP growth rate in countries where the firm operates plus the covariance between GDP growth rate in the United States and these countries. Variance and covariance are calculated using annual observations in the sample period. Source: The World Bank.
Inflation rate volatility	Variances of CPI rate in countries where the firm operates plus the covariance between CPI in the United States and these countries. Variance and covariance are calculated using annual observations in the sample period. Source: The World Bank.
Exchange rate volatility	Variances of real exchange rate in countries where the firm operates plus the covariance between real exchange rate in the United States and in these countries. Variance and covariance are calculated using annual observations in the sample period. Source: The World Bank.
Shared language	The percentage of subsidiaries incorporated in the countries that have shared language with the United States. Source: Stulz and Williamson (2003) and the World Factbook.
Shared law	The percentage of subsidiaries incorporated in the countries that have shared law with the United States. Source: La Porta <i>et al.</i> (1998) and the World Factbook.
Colonial relations	The percentage of subsidiaries incorporated in the countries that have colonial relations with the United States. Source: The Centre d'Études Prospectives et d'Informations Internationales (CEPII).
FATA	The ratio of the foreign assets to total assets. Source: Datastream.
Advanced economies	The percentage of subsidiaries incorporated in countries that are advanced economies. Source: International Monetary Fund.
Credit rights	The weighted average of creditor rights variable across all countries in which the firm has subsidiaries, the weights being the number of subsidiaries in that country as a fraction of the firm's total number of subsidiaries. We average scores over ten years for each country and standardized scores bounded between zero and one as the final

Corruption	<p>measure of creditor rights. Source: La Porta <i>et al.</i> (1997, 1998) and Djankov <i>et al.</i> (2007).</p> <p>The weighted average corruption score for each multinational firm, the weight is the ratio of the number subsidiaries in a country divided by the total number of subsidiaries. For each country, we calculate a ten-year average score and standardized the score to be bounded between one and zero. We use one minus the scores obtained above as the final estimation of corruption. Source: Transparency International Corruption Perceptions Index</p>
Chapter 2 control variables	
Growth opportunity	The natural log of market to book value. Source: Datastream.
Profitability	The ratio of earnings before interest and taxes (EBIT) to total assets. Source: Datastream.
Tangibility	The ratio of tangible assets to total assets. Source: Datastream.
Firm Size	The natural log form of total assets. Source: Datastream.
Financial deficit	The accounting cash flow identity of dividend payments plus capital expenditures plus the net change in working capital minus operating cash flow (after interest and taxes), scaled by total assets. Source: Datastream.
Geographical distance	The distance between the capital cities of countries where subsidiaries operate and the capital city of the home country of the parent firm. Source: The Centre d'Études Prospectives et d'Informations Internationales (CEPII)
Shared religion	The proportion of subsidiaries of a firm incorporated in the countries where the dominant religion is the same as the home country of the parent firm. Source: The World Factbook.
Shared Language	The proportion of subsidiaries of a firm incorporated in the countries where the dominant language is the same as the home country of the parent firm. Source: The World Factbook.
Shared Law	The proportion of subsidiaries of a firm incorporated in the countries where the legal origin is the same as the home country of the parent firm. Source: The World Factbook.
Macroeconomic growth volatility	Standard deviations of GDP growth rate among countries where subsidiaries of a firm incorporate. Source: The World Bank.
Exchange rate volatility	Standard deviations of real exchange rate among countries where subsidiaries of a firm incorporate. Source: The World Bank.
Inflation volatility	Standard deviations of consumer price index (CPI) among countries where subsidiaries of a firm incorporate. Source: The World Bank.
Chapter 3 control variables	
Firm size	Natural log of the book value of total assets. Source: Datastream.
Profitability	The ratio of earnings before interest and taxes (EBIT) to total assets. Source: Datastream.
Investment opportunity	Market to book equity ratio. Source: Datastream.
Sales growth	Annual percentage change in the book value of total assets to the book value of total assets. Source: Datastream.
Assets growth	The annual percentage change in the book value of total assets to the book value of total assets. Source: Datastream.
Leverage	The ratio of total debts to total capital. Source: Datastream.
Firm age	Number of years since the company was incorporated. Source: Datastream.
E/C capital mix	Retained earnings to book equity ratio. Source: Datastream.
Cash flow volatility	Annual stock price volatility. Source: Datastream.
Business diversification	Number of business segments. Source: Datastream.
Inside holding	Percentage of closely-held shares. Source: Datastream.
Geographical distance (GD)_Big city	The geographical distance between the biggest home and host country cities. The unit is million kilometre. Source: the Centre d'Études Prospectives et d'Informations Internationales (CEPII).
Geographical distance (GD)_Capital	The geographical distance between the capital cities of the home and host country. The unit is million kilometre. Source: the Centre d'Études Prospectives et d'Informations Internationales (CEPII).
FSTS	Foreign to total sales. Source: Datastream.

FITI	Foreign to total net income. Source: Datastream.
Incorruptibility_ TI	The weighted average of incorruptibility at the firm level. The measure of incorruptibility is based on the corruption perceptions index of the Transparency International. Weight is the number of subsidiaries in a given country to the total number of subsidiaries of the firm. Source: Transparency International.
Incorruptibility_ World Bank	The weighted average of incorruptibility at firm level. The measure of incorruptibility is based on the Control of Corruption in the Worldwide Governance Indicators of the World Bank. Weight is the number of subsidiaries in a given country to the total number of subsidiaries of the firm. Source: The World Bank.
Incorruptibility_ LLSV	The weighted average of incorruptibility at firm level. The measure of incorruptibility is based on the corruption index of La Porta <i>et al.</i> (1999) and La Porta <i>et al.</i> (2008). Weight is the number of subsidiaries in a given country to the total number of subsidiaries of the firm. Source: La Porta <i>et al.</i> (1999) and La Porta <i>et al.</i> (2008).
Capital control	The weighted average of capital control at the firm level. The measure of capital control is based on Fernández <i>et al.</i> (2016). Weight is the number of subsidiaries in a given country to the total number of subsidiaries of the firm. Source: Fernández <i>et al.</i> (2016).

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