Cultural diversity and capital structures of multinational firms

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Abstract

In this paper, we construct a measure of cultural diversity within the U.S. multinational firms. We then examine to what extent cultural diversity affects the capital structure of multinational firms. We find that the higher the cultural diversity, the lower the leverage ratio. The negative relation between cultural diversity and the leverage ratio holds after controlling for firm-level determinants, country-level factors, and macroeconomic risks. Further, we show that cultural diversity influences capital structures of multinationals mainly through equity issuance instead of debt reduction. Our findings suggest that cultural diversity plays a significant role in determining capital structure of firms in a multinational setting.

Keywords: cultural diversity, capital structure, multinational firms, globalization
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1 Introduction

The extant literature has shown that capital structures of multinational firms are distinctive. One strand of studies finds that multinationals have lower leverage ratios than purely domestic companies Burgman (1996, Lee and Kwok (1988, Park, Suh and Yeung (2013). Another strand of studies reports that, among multinational firms, leverage ratios decrease as the degree of foreign operations increases Doukas and Pantzalis (2003, Mittoo and Zhang (2008).[1] 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 multinational firms' operations. This would render multinational firms more costly to obtain external capital and therefore the reduction in the use of leverage.

While these studies find consistent results 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 flows available to managers and therefore restrict the possibility of overinvestment, consuming perquisite, and empire building. Berger, Ofek and Yermack (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 to align the benefits of managers and shareholders. Harvey, Lins and Roper (2004) report that firms with high agency costs may prefer to be more leveraged, as some of the risks can be shared by debt-holders.

The above contradiction raises an interesting question of what causes the low leverage ratios of multinational firms. In this paper, we attempt to investigate this issue by focusing on

[1] Mittoo, Usha R., and Zhou Zhang, 2008, The capital structure of multinational corporations: Canadian versus U.S. evidence, *Journal of Corporate Finance* 14, 706-720. 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.

cultural diversity, an important characteristic of multinational firms. Cultural diversity is an inevitable result and "byproduct" when the firm establishes subsidiaries in various foreign countries, where the management practices and organizational control systems are unlikely to be the same. As a consequence, cultural diversity could influence firm financial strategies and practices and brings new challenges to multinational firms. Gómez-Mejia and Palich (1997, Palich and Gomez-Mejia (1999). These increased challenges can be mainly reflected in two aspects regarding 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 the case that those countries are culturally distant from home countries Nohria and Ghoshal (1994). Further, cultural diversity would create obstacles for investors to accurately evaluate the operations of multinational firms. Aabo, Pantzalis and Park (2015) suggest that operating in a large number of culturally different settings worsens 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-agency issues, which could be the main cause of the lower leverage ratios of multinational firms as suggested by the existing literature.

In this paper, we provide an empirical examination of the effect of cultural diversity within multinational firms on their capital structures. We use a sample of 2,367 U.S. listed firms operating in 190 nations over a ten-year period 2004-2013. This provides us with 11,562 firm-year observations. Our primary proxy for cultural diversity within multinational firms is an entropy measure based on Hofstede's cultural framework. To confirm the robustness of our results, we also use alternative cultural frameworks, namely, Schwartz's egalitarianism scores Siegel, Licht and Schwartz (2011), World Vale Survey's (WVS) individualism and trust dimensions, and GLOBE's House, Hanges, Javidan, Dorfman and Gupta (2004) cultural

framework.

To examine how capital structures are impacted by cultural diversity within multinational firms, 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. The 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 these firm-level characteristics. The results remain after further controlling for country-level characters, including common religion, language, and law and geographic distance. Further, the negative effect of cultural diversity does not significantly change after controlling for macroeconomic volatility, including 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, in addition to economic risks.

The decrease in leverage ratios can be the consequences of two possibilities: an increase in equity or a reduction in debt. We thus further investigate through which of these possibilities, cultural diversity plays a role in affecting 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 less the likelihood that multinational firms reduce debt in the following period. This sharply contradicts the previous arguments in the multinational capital structure studies that the low leverage ratios of multinational firms are caused by debt reduction. Nevertheless, the findings of our paper 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, Vijh (2006).

In addition, we do not find evidence that cultural diversity leads to a simultaneous equity issuance and debt reduction. These results illustrate that the negative relation between cultural diversity and leverage ratios of multinational firms is mainly driven by equity issuance.

This paper 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 in determining capital structures, this is the first paper to investigate the effect of cultural exposures within firms on capital structure decisions. Stulz and Williamson (2003) find that national cultures are critical in explaining the effectiveness of creditor rights protection across countries. Sekely and Collins (1988), Chui, Lloyd and Kwok (2002) and Zheng, El Ghoul, Guedhami and Kwok (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. Aforementioned papers suggest that national culture has a fundamental influence on personal value, formal institutions, and preference of resource allocation, and therefore has strong explanatory power for the variation in the ways of firm financing across countries. In this paper, we take a further step to show that potential cultural conflicts within a firm significantly influence its capital structure decisions as well.

Second, this paper contributes to studies on the capital structure of multinational firms. Desai, Foley and Hines (2004) and Huizinga, Laeven and Nicodeme (2008) focus on subsidiary leverage and find that the difference in tax rates motivates firms to shift debt to high-tax countries. Different from the above studies, this paper investigates how firm-level capital structures can be affected by country exposures. In this sense, this paper is most closely related to Desai, Foley and Hines (2008), who focus on aggregated political risks (formal institutions) of multinational firms and find that the higher the political risk, the lower the leverage ratio of

a firm. By contrast, we focus on a cultural diversity (informal institutions) of multinational firms. Therefore, the result of our paper provides an important complement to Desai, Foley and Hines (2008) and suggest that, in addition to the formal institution, informal factors should also be taken into account when evaluating capital structures of multinational firms.

Finally, our findings make a contribution 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 of managerial entrenchment Aabo, Pantzalis and Park (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. Vijh (2006) shows that parent-subsidiary structured firms are more likely to issue equity. Cultural diversity further increases firm complexity, as multinational firms not only are established based on parent-subsidiary structures, but also have to organize their foreign subsidiaries according to local cultures Rosenzweig and Singh (1991). This may increase the tendency for multinational firms to issue equity.

The remainder of the paper is organized as follows. In the next section, we present the theoretical framework and develop hypotheses. In section 3, we describe data, sample, and variables. In section 4, we report the results of empirical tests. In section 5, we conclude the paper.

2 Literature and hypotheses

In this section, we provide theoretical arguments on the effect of cultural diversity on capital structures of multinational firms and develop hypotheses for leverage ratios and debt-equity choices, respectively.

2.1 Cultural diversity and leverage ratios

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

by agency problems Doukas and Pantzalis (2003), information asymmetry Burgman (1996), and the riskiness of foreign investments Desai, Foley and Hines (2008). Cultural diversity is closely associated with these factors. First, cultural diversity intensifies agency issues, which is argued to be the main cause of lower leverage ratios of multinational firms in the existing studies Doukas and Pantzalis (2003, Lee and Kwok (1988). Since the ways of information delivery are different from one culture to another Sperber and Hirschfeld (2004), cultural diversity makes monitoring more difficult and expensive. It may be likely for very large investors to hire an audit firm who has offices or has contracts with local audit firms in these markets. This approach, however, 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 more likely to be difficult and the integration costs would be high. This could impede investors to accurately evaluate the potential synergies from overseas expansions. In addition, a well-functioning international capital market can provide arbitrage opportunities that may reduce agency costs Hodder and Senbet (1990). Nonetheless, cultural difference may render investors reluctant to participate in foreign financial markets and therefore create barriers for investors to take advantage of these 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, Pasquariello and Wu (2009). It could be argued that cultural diversity is associated with severe information frictions, and therefore would make it difficult for investors to collect and analyze financial information on the subsidiaries located in culturally distant markets Aabo, Pantzalis and Park (2015, Shroff, Verdi and Yu (2014). As a direct evidence in the finance literature, Huang (2015)

shows that cultural difference makes it more difficult for investors to understand the 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. It, therefore, can be expected that the more the different 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 leverage ratios of multinational firms Desai, Foley and Hines (2008). The uncertainties of operating in countries with greater cultural distances can be from unfamiliarity because the higher the cultural differences, the less the knowledge about local markets Cao, Han, Hirshleifer and Zhang (2011). To avoid such uncertainty, firms prefer to make direct foreign investments in cultures that are similar to the home country Davidson (1980) or carefully choose an entry mode to enter into culturally distant markets Barkema, Bell and Pennings (1996, Kogut and Singh (1988, López-Duarte and Vidal-Suárez (2010, Shane (1994). Further, with cultural diversity increases, the uncertainty regarding the future foreign cash flow estimation also increases. It has been documented that there are cross-cultural differences in voluntary annual report disclosures Meek, Roberts and Gray (1995). In addition, the unfamiliarity of different cultures and cross-cultural differences in financial practices would reduce the effectiveness of hedge strategies of multinational firms Chowdhry and Howe (1999, Kerkvliet and Moffett (1991, Lievenbrück and 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 multinational firms. To summarize, our first hypothesis is:

H1: Lower leverage ratios of multinational firms are associated with cultural diversity.

2.2 Cultural diversity and debt-equity choices

Cultural diversity is related to the complexity of the contracting environment and thus 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 contracting efficiency of the firm Aghion and Bolton (1992). Due to bounded rationality of human actors, however, it is impossible for all relevant contingencies being completely contracted. Under incomplete contracting, the choice of financing resources can largely be influenced by the complexity of the contracting environment, which include not only the formal institutional environment but also the informal institutional environment (culture) Williamson (1998). Between them, culture is a more foundational factor as it represents a system of values and beliefs that underline the formal institutions Williamson (2000). Therefore, the multinational capital structure decisions on the choice of different financing resources (debt or equity) would be eventually influenced by cultural diversity.

2.2.1 Cultural diversity and the debt decision

Prior studies suggest that global diversification increases agency costs of debt, which makes it more difficult for debt-holders to actively monitor multinational firms Burgman (1996, Doukas and Pantzalis (2003, Lee and Kwok (1988, Mittoo and Zhang (2008, Park, Suh and Yeung (2013), and therefore lead to a reduced use of debt. Cultural differences can be one of the main cause of the increased agency costs of debt. For instance, Burgman (1996) and Mittoo and Zhang (2008) suggest that language differences increase informational gaps, which lead to higher costs for debtholders to monitor foreign operations of multinational firms. The phenomenon that informational obscurity associated with multinational operations leads 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 to raise funds from external markets. Consequently, multinational firms tend to rely more on their internal capital

markets and thus 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. These arguments formulate the following hypothesis:

H2a: Cultural diversity lowers leverage ratios by reducing the use of debt.

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 outside equity. There are two reasons. First, firm complexity increases monitoring costs of outside 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 outside shareholder base, which further exacerbates the difficulty for shareholders to closely monitor managers. This increased monitoring cost would provide managers with bigger chances of discretionary uses of free cash flow. Myers (2000) therefore 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 remains underlying principles of equity issuing.

Given the fact that cultural diversity in our study is associated with the parent-subsidiary structure of multinational firms, the tendency for the multinationals to issue equity may further increase. Vijh (2006) investigates the equity issuance decisions of parent-subsidiary structured firms and finds that these firms tend to issue equity to exploit the overvaluation associated with parent-subsidiary structures, rather than to enhance financing flexibility. This finding is in line with Myers (2000), suggesting that parent-subsidiary structured firms are complex and thus 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 accurately evaluate firms' operations. Therefore, cultural diversity can increase agency costs by inhibiting the shareholders' ability to share the benefits they deserve. This may lead managers of multinational firms to have a stronger incentive to issue equity. Our final hypothesis, therefore, is:

H2b: Cultural diversity lowers leverage ratios by increasing the use of equity.

3 Data

In this section, we describe the sample selection and variable construction for cultural diversity (the main variable of interest), capital structure (the dependent variables), and control variables.

3.1 Sample construction

To measure cultural diversity within U.S. multinational companies, we collect data for U.S. firms listed on the NYSE, NASDAQ, and AMEX for the period 2004 to 2013. Our main data source is Orbis, maintained by Bureau van Dijk. Orbis offers subsidiary-level information related to the nation of incorporation. This enables us to effectively measure cultural diversity within multinational firms. We include firms with ultimate controlling interest (at least 51.01% ownership) over subsidiaries to ensure that the multinational firms in the sample actively manage their foreign operations rather than just passively hold foreign financial assets. We further exclude financial and real estate firms and firms that do not have information regarding capital structures. In terms of data at the subsidiary level, one concern could be that financial subsidiaries are likely to be special purpose vehicles (SPV) whose main objective is the risk management to prevent parent firms from loan default or bankruptcy and is irrelevant to firm

operational activities. To alleviate this concern, we include only industrial subsidiaries. [2] The final sample contains 2,367 parent firms with 165,645 subsidiaries, providing 11,562 parent-level firm-year observations.

Insert Table 1 here

Table 1 reports the sample distribution. The first row of Table 1 shows that the number of sample firms steadily increases from 2004 to 2013. The second row of Table 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 subsidiaries of the sample firms 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.

3.2 The measure of cultural diversity

We begin the construction of cultural diversity measure by calculating cultural distance. We first assign cultural scores to each subsidiary, according to the country of incorporation and corresponding scores of Hofstede's six cultural dimensions -- power distance (PDI), uncertainty avoidance (UAI), individualism (IDV), masculinity (MAS), long-term orientation (LTO) and indulgence (IND).[3] We then use these scores to calculate the cultural distance

[2] 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. Within the subsidiaries that Orbis classifies as the industrial company, we look into the name of these subsidiaries, finding that several subsidiaries contain the word such as "holding", "investment", "fund", "finance" and "trust" in their titles and remove these subsidiaries.

[3] PDI suggests the degree to which people in a society are willing to accept inequality in power. UAI indicates the degree to which people in a society tolerate the unstructured or unknown situations. IDV measures the degree to which people in a society focus on him or herself rather than a group. MAS refers the degree to which people in a society focus on men's value versus women's value, the former examples include competitiveness and ambition and the latter examples include modesty and caring. LTO reflects the degree to which people in a society foster of virtues toward the future rather than the past and present. IND embodies the degree to which people in a society value more on enjoying life instead of self-control Hofstede, Geert, Gert Jan Hofstede, and Michael Minkov, 2010. *Cultures and organizations : Software of the mind : Intercultural cooperation and its importance for survival* (McGraw-Hill, New York)..The online Hofstede center (https://geert-hofstede.com) is used as a complementary data source.

between a parent firm and each of its subsidiaries using the Euclidean version of Kogut and Singh's (1988) formula. This approach is commonly used in the finance literature, such as Beugelsdijk and Frijns (2010), Frijns, Dodd and Cimerova (2016), Huang (2015) and Karolyi (2016). Specifically,

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

where $\text{Distance}_{\text{US,j}}$ is cultural distance between the U.S. where parent firm *i* is located and the host country *j* where firm *i*'s subsidiary is located. $\text{I}_{\text{k,j}}$ *i*s the score of the *k*th cultural dimension of foreign country *j*. $\text{I}_{\text{k,US}}$ is the score of the *k*th cultural dimension of the U.S.. V_k is in-sample variance of the *k*th cultural dimension. The Euclidean distance as shown in Equation (1) is particularly suitable as it measures 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. We also use the same method to calculate cultural distance based on the GLOBE's (2004) cultural framework,[4] the Schwartz's egalitarianism scores (in the year 2005 release of cultural values dataset) Siegel, Licht and Schwartz (2011), and the

[4] The GLOBE divides cultures in terms of nine dimensions: power distance, uncertainty avoidance, institutional collectivism, in-group collectivism, assertiveness, gender egalitarianism, future orientation, humane orientation and performance orientation. While there may be a similarity in some dimensions between the GLOBE and Hofstede cultural measures, the GLOBE project use different method to construct the measures and capture more aspects than the Hofstede dimensions. Further, the GLOBE framework is commonly used as an important alternative cultural measures to the Hofstede dimensions in prior studies, such as Frijns, Bart, Olga Dodd, and Helena Cimerova, 2016, The impact of cultural diversity in corporate boards on firm performance, *Journal of Corporate Finance* 41, 521-541., Hutzschenreuter, Thomas, Johannes C. Voll, and Alain Verbeke, 2011, The impact of added cultural distance and cultural diversity on international expansion patterns: A penrosean perspective, *Journal of Management Studies* 48, 305-329. and Karolyi, George Andrew, 2016, The gravity of culture for finance, *Journal of Corporate Finance* 41, 610-625..

World Value Survey (WVS) individualism[5] and trust[6] measures.

Based on the cultural distance measures above, we employ an entropy measure of cultural diversity. Entropy is recommended by Nijkamp and Poot (2015) and has become a well-accepted measure of corporate diversity in finance studies.[7] Using the entropy measure of cultural diversity has the following advantages. First, the entropy measure captures firm complexity Palepu (1985). This is important for our study because cultural diversity increases multinational firms' complexity by increasing not only cultural distances between home and host countries, but also the number of different cultures where subsidiaries operate. Second, entropy can more appropriately capture corporate diversity than Herfindahl index, which is designed to capture corporate concentration Jacquemin and Berry (1979). More importantly, as the entropy is introduced from information theory, it can reflect the degree of informational complexity that are inflicted by candidate frictional factors Krishnaswami, Spindt and Subramaniam (1999, Krishnaswami and Subramaniam (1999), and therefore can capture informational frictions in cultural diversity. We construct an entropy measure of cultural

[5] Following Ahern, Kenneth R, Daniele Daminelli, and Cesare Fracassi, 2015, Lost in translation? The effect of cultural values on mergers around the world, *Journal of Financial Economics* 117, 165-189., 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 to be bounded between zero and one for the countries in the sample.

[6] Following Guiso, Luigi, Paola Sapienza, and Luigi Zingales, 2003, People's opium? Religion and economic attitudes, *Journal of Monetary Economics* 50, 225-282., 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 to be bounded between zero and one for the countries in the sample.

[7] Jacquemin, Alexis P., and Charles H. Berry, 1979, Entropy measure of diversification and corporate growth, *Journal of Industrial Economics* 27, 359-369. is a milestone paper that introduces entropy into corporate diversification studies. Later on, an increasing number of finance studies have adopted entropy to evaluate business and geographic diversity Errunza, Vihang R., and Lemma W. Senbet, 1984, International corporate diversification, market valuation, and size‐adjusted evidence, *Journal of Finance* 39, 727-743, Hitt, Michael A, Robert E Hoskisson, and Hicheon Kim, 1997, International diversification: Effects on innovation and firm performance in product-diversified firms, *Academy of Management Journal* 40, 767-798, Krishnaswami, Sudha, and Venkat Subramaniam, 1999, Information asymmetry, valuation, and the corporate spin-off decision, *Journal of Financial Economics* 53, 73-112, Palepu, Krishna, 1985, Diversification strategy, profit performance and the entropy measure, *Strategic Management Journal* 6, 239-255. and to investigate capital structures Cassell, Cory A., Shawn X. Huang, Juan Manuel Sanchez, and Michael D. Stuart, 2012, Seeking safety: The relation between CEO inside debt holdings and the riskiness of firm investment and financial policies, *Journal of Financial Economics* 103, 588-610, Krishnaswami, Sudha, Paul A. Spindt, and Venkat Subramaniam, 1999, Information asymmetry, monitoring, and the placement structure of corporate debt, ibid.51, 407-434..

diversity as follows:

$$Cultural\ diversity_{it} = \sum_{j=1}^{J} Distance_{US,j} \cdot N_{ijt} ln\ (1/N_{ijt}) \qquad (2)$$

where Cultural $\text{diversity}_{\text{it}}$ is the entropy of cultural diversity for multinational firm *i* at the end of the calendar year *t*. N_{ijt} is the proportion of the number of firm *i*'s subsidiaries in country *j* to the total number of firm *i*'s subsidiaries at the end of the calendar year *t*. $Distance_{US,j}$ is the cultural distance between the U.S., the home country of firm *i*, and country *j* where firm *i*'s subsidiary is located. In essence, cultural diversity in Equation (2) captures both cultural dispersion of firm *i* and cultural distance between the U.S. and foreign country *j*.

Insert Table 2 here

Panel A of Table 2 shows the summary statistics for cultural diversity. The mean (median) value of cultural diversity measured by Hofstede framework is 3.03 (2.26) with the maximum value of 9.53. The mean value of cultural diversity in terms of the GLOBE framework, egalitarianism, individualism, and trust are 2.93, 0.91, 0.67, and 0.83, respectively.[8]

3.3 The 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 and Zingales (1995). Book leverage ratio is calculated as the sum of short- and long-term debts divided by total capital, and market leverage ratio is calculated as the sum of short- and long-term debts divided by book value of total debt plus market value of equity. The financial data regarding leverage ratio calculation

[8] The data also reveal that the mean values of cultural diversity increase from 2004 to 2013, and that firm-year observations are mainly from manufacturing industry, followed by service industry.

are obtained from 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 net issuance of debt and equity. Following Frank and Goyal (2003) and Hovakimian, Opler and Titman (2001), we define net debt issuance as 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 sales of common and preferred equity minus retirements, redemption, and repurchases of common and preferred equity. Both net debt issuance and net equity issuance are scaled by total assets. The data regarding net equity and debt issuance are obtained from Worldscope.

Panel B of Table 2 reports the summary statistics for the measures of capital structure. The means (medians) of book and market leverage ratios of the sample are 29.18% (22.08%) and 18.25% (10.69%), respectively. The means (medians) of net debt and equity issuance of the sample are 0.60 (0.00) and -0.06 (0.01), respectively. The data indicate that on average, proceeds of debt issuance are slightly higher than the amount of debt reduction and that 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.

3.4 Traditional determinants of the 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 and Zingales (1995). Country-level factors include geographic distance and shared religion,

language and law Ahern, Daminelli and Fracassi (2015, Karolyi (2016, Siegel, Licht and Schwartz (2011). Finally, Desai, Foley and Hines (2008) argue that macroeconomic volatilities also reflect the riskiness of foreign investments and therefore influence leverage decisions of multinational firms. Similar to Desai, Foley and Hines (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 2. All the aforementioned variables are offered in Appendix I.

4 Results

In this section, we present our results for the effect of cultural diversity on the multinational capital structure. 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 the debt-equity choice.

4.1 Cultural diversity and leverage ratios

This section examines the effect of cultural diversity on leverage ratios using a standard leverage ratio regression and followed by a range of robustness tests.

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:

$$Leverage\ ratios_{i,t} = \beta_0 + \beta_1 \cdot Cultural\ Diversity_{i,t-1} + \beta_2 \cdot f(Z_{t-1}) + \varepsilon_{i,t} \qquad (3)$$

where $Leverage\ ratios_{i,t}$ is the book or market leverage ratio of firm *i* at year *t*. $Cultural\ Diversity_{i,t-1}$ 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 leverage ratios or the relation

between cultural diversity and leverage ratios as discussed in the previous section.

Insert Table 3 here

The estimation results are shown in Table 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 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 the specification (3) in which we use to the one-year lagged cultural diversity to predict the leverage ratio.

Cultural diversity may proxy for other country-level effects, such as religion, language, and law Stulz and Williamson (2003). In particular, the effect of cultural diversity may be closely related to geographic distance Mian (2006). To distinguish between the direct effects of cultural diversity on the leverage ratio, we control for these country-level factors. In column (2) of Panel A, we find 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, other than is a mere proxy for certain country-level effects. In column (3) of Panel A, we exclude cultural diversity and find that the effect of geographic distance becomes significant and negative, while other country-level variables remain significant. This result verifies the close relation between cultural diversity and geographic distance. By untangling cultural diversity and geographic distance, however, 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, Licht and Schwartz (2011), after controlling for geographic distance, find that cultural distance has a significantly negative effect on cross-border syndicated loans.

Studies suggest that macroeconomic factors can affect capital structures of multinational firms Burgman (1996, Desai, Foley and Hines (2008). To address the concern that the effect of cultural diversity on capital structure is influenced by macroeconomic risks, we follow Desai, Foley and Hines (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 remain to have the negative impact on leverage ratios. In column (6), however, when we include cultural diversity along with all the control variables, the effect of macroeconomic factors become insignificant. These results suggest that the influence of cultural diversity on 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 and 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 be changed 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 cultural diversity exposure of multinational firms. Therefore, cultural exposures can be more difficult to manage than economic risks.[9]

[9] It is noteworthy that Lee, Kwang Chul, and Chuck CY Kwok, 1988, Multinational corporations vs. domestic corporations: International environmental factors and determinants of capital structure, *Journal of International Business Studies* 19, 195-217. suggest that it is unclear whether macroeconomic risks influence firm capital structure decisions.

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 in book leverage ratio of 1.73% (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 and 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 and 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.[10]

In short, the results in this section confirm our first hypothesis, indicating that the larger the cultural diversity, the lower the leverage ratios. These results provide important evidence to 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 that are associated with lower leverage ratios of multinational firms.

4.1.2 Alternative cultural measures

One concern could be that our results may be biased to the cultural framework on which we rely. In this section, we address this concern by employing four alternative cultural

[10] On the one hand, as a 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, Sheridan, and Roberto Wessels, 1988, The determinants of capital structure choice, *Journal of Finance* 43, 1-19.. On the other hand, although growth opportunities add value to firms, they cannot generate current accounting profits and therefore cannot be collateralized, growth opportunities thus should negatively relate to leverage Goyal, Vidhan K., Kenneth Lehn, and Stanko Racic, 2002, Growth opportunities and corporate debt policy: the case of the U.S. defense industry, *Journal of Financial Economics* 64, 35-59..

measures that have been commonly used in finance and economics: GLOBE's (2004) cultural value framework, Schwartz's egalitarianism scores (in the year 2005 release of cultural values dataset) Siegel, Licht and Schwartz (2011), individualism Chui, Titman and Wei (2010), and trust Guiso, Sapienza and Zingales (2008).

Insert Table 4 here

In Table 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 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 both book and market leverage ratios, and these effects are statistically significant at the 1% level. 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 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 that the effect of trust diversity on the book leverage ratio.

To summarize, 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 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),[11] the results reported here suggest the lower leverage ratios are not at the optimal level for multinational firms. In the

[11] Results are reported in Appendix II. 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.

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.

4.1.3 Robustness over 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 time periods.

Insert Table 5 here

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 Panel A of Table 5, we report results for the 2004—2008 period; and in Panel B of Table 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 reports these results. We find that, after considering time effects, the influence of cultural diversity on leverage ratios remains negative and the 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 difficult to adapt to markets with different religions. 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.

4.1.4 Endogeneity concern

Roberts and Whited (2013) suggest that one endogeneity concern in capital structure studies is that managers may use their private information to determine leverage ratios. This information, however, may not be feasibly modeled 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 the 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 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.[12] If managerial leverage decisions are irrelevant to cultural diversity, we would expect to see a similar treatment effect on leverage ratios of firms with cultural diversity and those without.

Insert Table 6 here

In Panel A of Table 6, we match our sample firms with purely domestic firms by four firm-level characteristics. The result of the first stage, the propensity score generating process, shows that the coefficients on growth opportunity, tangibility and firm size are positive and significant at the 1% level, suggesting 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 neighbor 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

[12] Our data suggest that the situation that firms concentrate the overseas operation in only one foreign country is not uncommon – 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 concentrate their operation in only one foreign country would end up to a zero cultural diversity.

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 6, we match our sample firms with firms concentrating operations in one foreign country by geographic distance in addition to four firm-level characteristics. The result of the first-stage shows that the coefficients on geographic distance, tangibility, size, and profitability are positive and significant. In contrast, the coefficient on 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, the effects are negative and significant (the only exception is for the Kernel matching on book leverage ratios), suggesting 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 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 Fama-MacBeth regressions. All regressions control for firm-level determinants, country-level factors, and macroeconomic volatilities. The 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.

4.1.5 Further robustness and economic importance

Prior studies suggest that industry effects are important to firm capital structure decisions MacKay and Phillips (2005, Titman and Wessels (1988). Although in previous sections, we include industry dummies to control for industry effects, this approach does not consider that within an industry, firms' leverage ratios may not be relevant as a key variable of interest Lang,

Ofek and Stulz (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, Ofek and Stulz (1996)'s approach by subtracting the industry mean and then estimate Equation (3).

Insert Table 7 here

In Table 7, we report results of industry-adjusted regressions estimated by OLS (Panel A) and Fama-MacBeth (Panel B) regressions. 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 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, Ofek and Stulz (1996). On the other hand, reducing debt service eases bankruptcy costs and therefore reduces agency costs of debt Mella-Barral and Perraudin (1997, Mello and Parsons (1992). Therefore, if global diversification increases agency costs of debt and therefore 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 Panel B of Table 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 and significantly 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 both debt and equity activities

4.2 Cultural diversity and the debt-equity choice

Our earlier analyses focus on leverage ratios and find a negative effect of cultural diversity on leverage ratios. However, the mechanism underlying this effect is unclear. The 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 paper is that changes in cultural diversity lead to changes in capital structure decisions of multinational firms. Leverage ratios can only reflect overall situations of capital structure, whereas the analysis of debt-equity activities can further reveal the channels through which cultural diversity cause capital structures to change.

Insert Table 8 here

To illustrate the importance of investigating financial activities, Table 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 the total debt and equity activities, respectively. Second, in 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. These results illustrate the pervasiveness of financial activities in the sample firms.

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 hypothesis that whether multinational firms lower leverage ratios through issuing equity or reducing debt. Specifically, we estimate three probit regressions, respectively, for equity issuance, for debt retirement, and for both. Similar to Brav (2009) and Hovakimian, Opler and Titman (2001), we control for financial deficits, in addition to variables used in earlier analyses, and define financial deficits as dividend payments plus capital expenditures plus the net change in working capital minus operating cash flow after interest and taxes.

Insert Table 9 here

In Table 9, we report estimation results based on five cultural measures from Panel A to Panel 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 the arguments of agency costs of debt in prior studies, which posits that lower leverage ratios of multinational firms are caused by a reduction in debt either because debtholders are reluctant to lend capital to firms or because debts are too costly for firms to borrow due to 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 our hypothesis H2a that multinational firms with a higher degree of cultural diversity are more likely to reduce debt.

The second column in Table 9 shows the financial decision on 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 of cultural diversity measured by trust. We also calculate marginal effects at means for the coefficients on 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.[13] 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 are in line with our hypothesis H2b 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 Table 8 showing that this dual decision occurs around 12% out of the total financial activity observations, indicating this case is not rare. In the third column of each panel in Table 9, we test the effect of cultural diversity on this dual decision. Specifically, we introduce a dummy for instances in which a firm both issues equity and retires debt at the same year *t*, and the 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. Overall, these results do not support that cultural diversity increases the likelihood of the dual decision of equity issuance and debt retirement, suggesting that the previous results are not driven by the dual decision of equity issuance and debt retirement at the same period.

Overall, the results in this section strongly support the hypothesis H2b that multinational

[13] One unit more than mean cultural diversity is not an aggressive estimate, given standard deviations of cultural diversity are 2.57 and 2.41 measured by the Hofstede and GLOBE framework, respectively.

firms with higher degrees of cultural diversity reduce leverage ratios by issuing equity, and do not support the hypothesis H2a that cultural diversity reduces leverage ratios by reducing debt.

4.2.2 Cultural diversity and net issuance of debt and equity

One concern in relation to the results presented in the previous section arises from the way we classify financial decisions. Specifically, we did not simultaneously consider equity repurchase with equity issuance and debt issuance with debt retirement, because such instances do not directly answer the question how lower leverage ratios associated with cultural diversity are generated. However, firms issuing equities may conduct share repurchases and firms that retire debts may at the same period issue debts. Indeed, Table 8 shows that these can be common activities –issuing and retiring activities in the same firm-year for debt and equity are 40.26% and 39.32%, respectively.

To address this potential pitfall, in this section we examine the effect of cultural diversity on the amount of net equity and debt issuance, respectively. In the spirit of Hovakimian, Opler and Titman (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 employ first difference and fixed effects estimations, as firm financial decisions are prone to endogeneity problems. We further control for lagged net equity/debt issuance because financial activities in the previous period may affect the current fund-raising amount.

Insert Table 10 here

In Table 10, we report results from the first difference regressions in Panel A and from the fixed effects regressions in Panel B.[14] In Panel A, we find no evidence shows that cultural

[14] 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.

diversity and net debt issuance have a significant relation, 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 the results from the previous section, suggesting that lower leverage ratios associated with cultural diversity are caused by the 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 finances deficits mainly 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 further evidence that that the decreases in leverage ratios associated with cultural diversity are mainly caused by an increase in net equity issuances (hypothesis H2b) rather than a reduction in debt (hypothesis H2a).

5 Conclusion

In this paper, we examine the impact of cultural diversity on 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 controlling for firm-level determinants commonly cited in the literature. The result also remains valid when we further control for country-level factors, including geographic distance, and shared religion, language and law, and control for macroeconomic volatilities, including economic growth, foreign exchange, and inflation rate volatilities, suggesting that cultural diversity plays a distinctive role in determining firm leverage ratios, rather than just a proxy for aforementioned factors. Our results are robust to alternative cultural measures, to different time periods, and to endogeneity. Furthermore, 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. These results suggest that cultural

diversity is a vital factor in managerial decision making on capital structures of multinational firms.

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Table 1
Sample distribution

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.

	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

Table 2
Summary statistics
This table reports descriptive statistics for variables of 3,326 firms from 2004 to 2013. Panel A reports summary statistics for cultural diversity. 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 located in country j to the number of firm i 's subsidiaries, $Distance_{US,j}$ is cultural distance between the U.S., the home country of the sample firms and country j, the country where firm i's subsidiary is located. $Distance_{US,j}$ is computed using a Euclidean version of the Kogut and Singh (1988)'s formula based on five alternative cultural measures. (1) 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). (2) GLOBE's (House et al, 2004) cultural dimensions. (3) Schwartz Egalitarianism scores (Siegel et al., 2011) of the 2005 release of the data set. (4) World Value Survey individualism scores. (5) World Value Survey trust scores. Panel B reports capital structure variables. Book leverage ratio is the total debt divided by the total book value of capital. Market leverage ratio is the total debt divided by the book value of the total debt plus the market value of equity. Net debt issuance is proceeds from total debt issuance minus the amount of total debt reduction, and net equity issuance is proceeds from sales of common and preferred equity minus retirements and repurchases of common and preferred equity. Net equity issuance and net equity issuance are scaled by total assets Panel C reports control variables. Firm-level control variables include the growth opportunity (the logarithm of market to book ratio), tangibility (the ratio of tangible assets to total assets), firm size (the logarithm of firm total assets) and profitability (the ratio of EBIT divided by total assets). Country-level control variables include the proportion of subsidiaries of a firm incorporated in the countries where the religion, language, and law are the same with the home country of the parent firm. Geographic distance is the distance between capital cities of countries where subsidiaries operate and the capital city of the home country of the parent firm. Macroeconomic variables include economic growth volatility, exchange rate volatility and inflation volatility. Economic growth rate volatility, exchange rate volatility and inflation volatility are measured by standard deviations of GDP growth rate, real exchange rate and consumer price index (CPI), respectively. The data are also obtained from the World Bank open database (http://data.worldbank.org) and standard deviations are calculated using cross-sectional dispersion among countries where subsidiaries are incorporated. Data are winsoriesed at the 1% of the both sides of data distribution.

	Observations	Mean	Standard deviation	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
Net debt issuance (%)	12,464	0.60	8.07	-24.39	0.00	36.33
Net equity issuance (%)	12,464	-0.06	9.91	-27.27	0.01	64.19
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
Geographic 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

Table 3

The effect of cultural diversity on leverage ratios

This table reports coefficients estimates of OLS regressions of leverage ratios on cultural diversity and firm- and country- level and macro-economic control variables. The dependent variable in Panel A is the book leverage ratio, which is total debt divided by total book value of capital. The dependent variable in Panel B is the market leverage ratio, which is total debt divided by book value of total debt plus market value of equity. 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 located in country j to the number of firm i 's subsidiaries, $Distance_{US,j}$ is cultural distance between the U.S., the home country of the sample firms and country j, the country where firm i's subsidiary is located. $Distance_{US,j}$ is computed using an Euclidean version of the Kogut and Singh (1988)'s formula and 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). Control variables are described in Appendix I. Numbers in parentheses report t-statistics based on White-corrected robust standard errors. *, **, and *** stand for the 10%, 5%, and 1% significance level, respectively.

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

Table 4
Cultural diversity and leverage ratios – Alternative cultural measures

This table reports the coefficients estimates of effect of cultural diversity with four alternative measures on book and market leverage ratios. Panel A reports the effect of cultural diversity with controlling for firm-level variables only. Panel B reports the effect of cultural diversity with controlling for firm-and country level variables. Panel C reports the effect of cultural diversity with controlling for firm-level and macro-economic variables. Panel D reports the effect of cultural diversity with 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 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 located in country j to the number of firm i 's subsidiaries, $Distance_{US,j}$ is cultural distance between the U.S., the home country of the sample firms and country j, the country where firm i's subsidiary is located. $Distance_{US,j}$ is computed using an Euclidean version of the Kogut and Singh (1988)'s formula that is based on four alternative cultural measures. (1) GLOBE's (House et al, 2004) cultural 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. Control variables are described in Appendix I. Numbers in parentheses report t-statistics based on White-corrected robust standard errors. *, **, and *** stand for the 10%, 5%, and 1% significance level, respectively.

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***				-1.0117***			
	(-11.49)				(-13.30)			
Egalitarian diversity$_{t-1}$		-4.8162***				-4.2120***		
		(-14.52)				(-16.63)		
Individualistic diversity$_{t-1}$			-6.0140***				-5.1640***	
			(-14.82)				(-16.07)	
Trust diversity$_{t-1}$				-2.2977***				-2.3142***
				(-6.99)				(-8.80)
Constant	-71.6917***	-71.2659***	-71.7987***	-69.3681***	-24.8113***	-24.3509***	-24.7987***	-23.2548***
	(-35.71)	(-36.23)	(-36.33)	(-34.31)	(-14.86)	(-14.99)	(-15.09)	(-13.70)
Industry and year dummy	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
Number 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***				-0.7729***			
	(-6.56)				(-8.80)			
Egalitarian diversity$_{t-1}$		-3.6916***				-3.5277***		
		(-10.05)				(-12.42)		
Individualistic diversity$_{t-1}$			-4.7422***				-4.4989***	
			(-9.96)				(-11.77)	
Trust diversity$_{t-1}$				-0.5233				-1.1446***
				(-1.43)				(-3.75)
Constant	-63.8050***	-65.7321***	-65.5477***	-60.7029***	-19.6789***	-20.8978***	-20.8148***	-17.4842***
	(-27.01)	(-28.28)	(-28.15)	(-25.48)	(-10.01)	(-10.91)	(-10.77)	(-8.71)

Industry and year dummy	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
Number 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***				-0.9695***			
	(-7.27)				(-8.92)			
Egalitarian diversity$_{t-1}$		-4.7960***				-4.3729***		
		(-11.33)				(-12.86)		
Individualistic diversity$_{t-1}$			-5.8579***				-5.1496***	
			(-11.60)				(-12.24)	
Trust diversity$_{t-1}$				-0.6691				-1.2662***
				(-1.56)				(-3.59)
Constant	-68.8081***	-69.6723***	-69.7588***	-64.2217***	-23.4014***	-23.6522***	-23.5590***	-19.9246***
	(-31.09)	(-32.63)	(-32.49)	(-28.33)	(-12.55)	(-13.32)	(-13.08)	(-10.36)
Industry and year dummy	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
Number 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***				-0.7650***			
	(-4.78)				(-6.84)			
Egalitarian diversity$_{t-1}$		-3.9707***				-3.7921***		
		(-9.07)				(-10.87)		
Individualistic diversity$_{t-1}$			-4.8197***				-4.5565***	
			(-8.80)				(-10.23)	
Trust diversity$_{t-1}$				0.5701				-0.3685
				(1.30)				(-1.01)
Constant	-62.8803***	-65.6037***	-64.9395***	-57.8071***	-19.2458***	-20.8694***	-20.2890***	-15.3641***
	(-25.44)	(-27.15)	(-26.93)	(-23.28)	(-9.27)	(-10.42)	(-10.07)	(-7.23)
Industry and year dummy	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
Number of observations	10,390	10,376	10,367	10,367	10,334	10,320	10,310	10,310

Table 5
Cultural diversity and leverage ratios – Sub-period analysis

This table reports the coefficients estimates of OLS regressions for two sub-sample periods and of Fama-Macbeth approach for the whole sample. Panel A reports regression results for the sub-period 2004-2008. Panel A reports regression results for the sub-period 2009-2013. Panel C reports regression results for the whole sample period with Fama-Macbeth approach. 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 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 located in country j to the number of firm i 's subsidiaries, $Distance_{US,j}$ is cultural distance between the U.S., the home country of the sample firms and country j, the country where firm i's subsidiary is located. $Distance_{US,j}$ is computed using an Euclidean version of the Kogut and Singh (1988)'s formula and 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). Control variables are described in Appendix I. 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 the 10%, 5%, and 1% significance level, respectively.

	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**	-0.5563**	-0.7683***	-0.4972***	-0.7666***	-0.5579***
	(-2.07)	(-2.27)	(-3.25)	(-2.67)	(-6.51)	(-5.79)
Growth opportunity$_{t-1}$	6.2294***	-6.6261***	5.8392***	-5.6292***	6.3868***	-5.9858***
	(7.45)	(-11.05)	(10.60)	(-13.56)	(15.17)	(-19.32)
Tangibility$_{t-1}$	1.0479***	0.7163***	1.3438***	0.7334***	1.1683***	0.7115***
	(5.60)	(4.90)	(8.48)	(5.71)	(10.17)	(8.72)
Firm size$_{t-1}$	4.0105***	2.5453***	5.2192***	3.2679***	4.5205***	2.8146***
	(14.80)	(10.76)	(24.13)	(19.81)	(11.19)	(10.61)
Profitability$_{t-1}$	-0.3779***	-0.2131***	-0.2812***	-0.1939***	-0.3475***	-0.2147***
	(-6.39)	(-5.95)	(-8.09)	(-10.14)	(-8.50)	(-13.78)
Shared Religion$_{t-1}$	-15.8422***	-8.8952***	-14.4899***	-11.2996***	-13.0527***	-7.7020***
	(-4.13)	(-2.84)	(-4.55)	(-4.99)	(-18.38)	(-5.64)
Shared Language$_{t-1}$	8.2922	7.1592	16.7830***	5.6178	9.6965*	3.8399
	(1.29)	(1.27)	(3.35)	(1.40)	(1.92)	(1.54)
Shared Law$_{t-1}$	-4.6915	-3.7652	-13.5423***	-1.6069	-6.5405	-0.5122
	(-0.78)	(-0.73)	(-3.21)	(-0.47)	(-1.50)	(-0.25)
Geographic distance$_{t-1}$	0.3788	-0.1604	0.1022	-0.6244**	0.5344	-0.2189
	(0.87)	(-0.41)	(0.26)	(-1.96)	(1.77)	(-0.98)
GDP growth rate volatility$_{t-1}$	0.3734	0.6872	-0.7934**	-0.3989	-0.6140*	-0.1555
	(0.84)	(1.44)	(-2.31)	(-1.41)	(-1.91)	(-0.81)
Exchange rate volatility$_{t-1}$	-0.2252*	-0.1882*	-0.0872	-0.0154	-0.4065**	-0.2960**
	(-1.83)	(-1.74)	(-0.85)	(-0.17)	(-2.59)	(-2.66)
Inflation volatility$_{t-1}$	-0.0004	-0.0009	0.7454**	0.2899	0.4758***	0.3609***
	(-0.13)	(-0.26)	(2.49)	(1.28)	(4.74)	(7.90)
Constant	-37.1838***	-10.1911***	-67.7492***	-20.5719***	-47.0242***	-12.1796***
	(-9.32)	(-2.88)	(-19.44)	(-7.12)	(-16.81)	(-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

Table 6
Propensity score match

This table reports the results of propensity score matches. Panel A reports results comparing leverage ratios of multinational firms with non-zero cultural diversity to that of purely domestic firms. Panel B reports comparing leverage ratios of multinational firms with non-zero cultural diversity to that of firms operating in only one foreign country. Panel C reports OLS regression results of leverage ratios of multinational firms with non-zero cultural diversity to that of firms with zero cultural diversity. Panel D reports Fama-Macbeth regression results of leverage ratios of multinational firms with non-zero cultural diversity to that of firms with zero cultural diversity. 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 located in country j to the number of firm i 's subsidiaries, $Distance_{US,j}$ is cultural distance between the U.S., the home country of the sample firms and country j, the country where firm i's subsidiary is located. $Distance_{US,j}$ is computed using an Euclidean version of the Kogut and Singh (1988)'s 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). ATT Nearest Neighbor is the average effect of the treatment on the treated based on the nearest neighbor matching. ATT 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 by matching with kernel weighting. The regressions in Panel C and D include control variables that are described in Appendix I. 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 the 10%, 5%, and 1% significance level, respectively.

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-statisic	# treat	# control	Coef.	t-statisic	# treat	# control
ATT Nearest Neighbor	-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			
Geographic 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-statisic	# treat	# control	Coef.	t-statisic	# treat	# control
ATT Nearest Neighbor	-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-statisic	Adj-R^2	N	Coef.	t-statisic	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-statisic	Adj-R^2	N	Coef.	t-statisic	Adj-R^2	N
Cultural diversity	-0.76***	(-5.46)	0.199	10,606	-0.58***	(-5.88)	0.177	10,548

Table 7

Economic importance of the relation between cultural diversity and leverage ratios

This table reports the coefficient estimates of OLS regressions and of Fama-Macbeth regression for four robust measures of leverage ratios. IA_Book represent industry adjusted book leverage ratios. IA_Market represent 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 book debt service ratio and is calculated dividing interest paid on debt by the book value of total capital. DS_Market represents market debt service ratio and is calculated dividing interest paid on debt by the market value of total capital. Cultural diversity is calculated as an entropy measure: $Cultural\ Diversity_i = \sum_{j=1}^{J} Distance_{US,j} * N_j \ln\left(\frac{1}{N_j}\right)$, where N_j is the proportion of firm i 's subsidiaries located in country j to the number of firm i 's subsidiaries, $Distance_{US,j}$ is cultural distance between the U.S., the home country of the sample firms and country j, the country where firm i's subsidiary is located. $Distance_{US,j}$ is computed using an Euclidean version of the Kogut and Singh (1988)'s 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). Control variables are described in Appendix I. 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 the 10%, 5%, and 1% significance level, respectively.

	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$_{t-1}$	-0.5313***	-0.6504***	-0.0196*	-0.0148*	-0.4761***	-0.5828***	-0.0110	-0.0226**
	(-3.79)	(-5.71)	(-1.75)	(-1.92)	(-7.93)	(-10.86)	(-0.60)	(-3.07)
Constant	-92.2270***	-39.2103***	-0.8769***	0.1629	-79.1855***	-42.4140***	-0.6182	-0.1069
	(-31.57)	(-15.83)	(-3.06)	(0.89)	(-20.00)	(-11.03)	(-1.18)	(-0.27)
Firm level $variables_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-level $variables_{t-1}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro-economic $variables_{t-1}$	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	--	--	--	--
$Adjusted\ R^2$ or R^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

Table 8
Distribution of Debt-Equity activities
This table reports the number and percentage of firm-year observations with the indicated financial activities. Panel A report equity activities. Panel B reports debt activities. Panel C presents firm-year observations that take part in both debt and equity activities. The data cover a 10-year period between 2004 and 2013.

	. Panel A: Debt		Panel B: Equity		Panel C: Both debt and Equity		
	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 and 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%

Table 9

Probit regressions of equity-debt decisions on cultural diversity

This table reports the results from three Probit models in relation to three financial decisions. In the first column, the dependent variable is equal to one if a firm issue equity at year *t*, and zero otherwise. In the second column, the dependent variable is equal to one if a firm retires debt at year *t*, and zero otherwise. In the third column, the dependent variable is equal to one if firm both issue equity and retire debt at year *t*, and zero otherwise. 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 located in country j to the number of firm i 's subsidiaries, $Distance_{US,j}$ is cultural distance between the U.S., the home country of the sample firms and country j, the country where firm i's subsidiary is located. $Distance_{US,j}$ is computed using a Euclidean version of the Kogut and Singh (1988)'s formula that is based on five alternative cultural measures. (1) 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). (2) GLOBE's (House et al, 2004) cultural dimensions. (3) Schwartz Egalitarianism scores (Siegel et al., 2011) of the 2005 release of the data set. (4) World Value Survey individualism scores. (5) World Value Survey trust scores. Penal A to E estimates the effects of cultural diversity with each of these cultural measures on equity and debt activities, respectively. All regressions include control variables that are described in Appendix I. 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 the 10%, 5%, and 1% significance level, respectively.

Dependent variable	Debt retiring$_t$	Equity issuing$_t$	Equity issuing$_t$ and Debt retiring$_t$
	Panel A: Hofstede		
Cultural diversity$_{t-1}$	-0.0482***	0.0352***	-0.0094
	(-4.06)	(2.65)	(-0.84)
Financial deficits$_{t-1}$	0.2960***	-0.0568	0.1343
	(2.63)	(-0.47)	(1.25)
$Constant$	-2.8081***	0.0566	-2.1087***
	(-16.52)	(0.32)	(-13.37)
Control variables	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***	0.0430***	-0.0075
	(-4.11)	(3.13)	(-0.64)
Financial deficits$_{t-1}$	0.2843**	-0.0867	0.1015
	(2.54)	(-0.72)	(0.95)
$Constant$	-2.8214***	0.0514	-2.1284***
	(-16.67)	(0.30)	(-13.62)
Control variables	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***	0.2021***	-0.0492
	(-5.89)	(4.71)	(-1.35)
Financial deficits$_{t-1}$	0.2775**	-0.0541	0.1117
	(2.47)	(-0.45)	(1.04)
$Constant$	-2.9010***	0.1567	-2.1592***
	(-17.72)	(0.93)	(-14.23)
Control variables	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***	0.2013***	-0.0932**
	(-5.67)	(3.87)	(-2.08)
Financial deficits$_{t-1}$	0.2823**	-0.1067	0.0943
	(2.51)	(-0.88)	(0.87)
$Constant$	-2.8872***	0.1006	-2.1952***
	(-17.49)	(0.59)	(-14.32)

Control variables t	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	-0.0087	0.0519
	(1.07)	(-0.21)	(1.48)
Financial deficits$_{t-1}$	0.2898**	-0.1157	0.0984
	(2.57)	(-0.96)	(0.91)
$Constant$	-2.4008***	-0.1913	-1.9537***
	(-14.36)	(-1.09)	(-12.49)
Control variables	Yes	Yes	Yes
$Pseudo\ R^2$	0.083	0.046	0.052
Number of observations	8,907	8,907	8,907

Table 10
Cultural diversity and equity-debt activities

This table reports the coefficient estimates of first difference and fixed effects regressions of 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 sales of common and preferred equity minus retirements and repurchases of common and preferred equity. Net debt issuance is proceeds from total debt issuance minus amount of total debt reduction, Net debt issuance and net equity issuance are scaled by total assets. 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 located in country j to the number of firm i 's subsidiaries, $Distance_{US,j}$ is cultural distance between the U.S., the home country of the sample firms and country j, the country where firm i's subsidiary is located. $Distance_{US,j}$ is computed using an Euclidean version of the Kogut and Singh (1988)'s formula based on five alternative cultural measures. (1) 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). (2) GLOBE's (House et al, 2004) cultural dimensions. (3) Schwartz Egalitarianism scores (Siegel et al., 2011) of the 2005 release of the data set. (4) World Value Survey individualism scores. (5) World Value Survey trust scores. All regressions include control variables and the construction of these control variables are described in Appendix I. Numbers in parentheses report t-statistics based on White-corrected robust standard errors that are clustered in firm. *, **, and *** stand for the 10%, 5%, and 1% significance level, respectively.

Dependent variable	(Net Debt issuance/Assets)$_t$					(Net Equity issuance/Assets)$_t$				
					Panel A: First difference					
Hofstede Cultural diversity$_{t-1}$	-0.0425					0.3908***				
	(-0.27)					(3.55)				
GLOBE Cultural diversity$_{t-1}$		-0.0221					0.4061***			
		(-0.14)					(3.57)			
Egalitarianism diversity$_{t-1}$			0.016					0.9869***		
			(0.03)					(2.63)		
Individualism diversity$_{t-1}$				0.3067					1.5193***	
				(0.48)					(3.26)	
Trust diversity$_{t-1}$					-0.0249					0.5900*
					(-0.05)					(1.77)
(Financial deficit/Assets)$_{t-1}$	4.4694***	4.4417***	4.4286***	4.4762***	4.4762***	-2.1855**	-2.2912***	-2.2748***	-2.3415***	-2.3248***
	(4.35)	(4.32)	(4.31)	(4.35)	(4.35)	(-2.51)	(-2.64)	(-2.61)	(-2.69)	(-2.67)
(Net Equity issuance/Assets)$_{t-1}$	-0.0238	-0.0295	-0.0291	-0.0298	-0.0299	-0.3349***	-0.3372***	-0.3363***	-0.3367***	-0.3373***
	(-1.15)	(-1.46)	(-1.44)	(-1.47)	(-1.47)	(-12.53)	(-12.72)	(-12.67)	(-12.67)	(-12.67)
(Net Debt issuance/Assets)$_{t-1}$	-0.4314***	-0.4323***	-0.4330***	-0.4319***	-0.4319***	0.0753***	0.0769***	0.0782***	0.0783***	0.0780***
	(-23.63)	(-23.70)	(-23.68)	(-23.61)	(-23.61)	(6.22)	(6.41)	(6.48)	(6.51)	(6.49)
Constant	0.6161***	0.5967***	0.6027***	0.5974***	0.5990***	0.4280***	0.4346***	0.4501***	0.4604***	0.4596***
	(4.99)	(4.84)	(4.89)	(4.84)	(4.86)	(4.34)	(4.41)	(4.57)	(4.70)	(4.68)
Control variables	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					0.2292**				
	(1.12)					(2.15)				
GLOBE Cultural diversity$_{t-1}$		0.1142					0.2573**			
		(0.84)					(2.31)			

Egalitarianism diversity$_{t-1}$			0.3490					0.4451		
			(0.75)					(1.19)		
Individualism diversity$_{t-1}$				0.5550					1.3135***	
				(1.04)					(2.95)	
Trust diversity$_{t-1}$					0.6919					0.2729
					(1.57)					(0.84)
(Financial deficit/Assets)$_{t-1}$	4.9723***	4.9840***	4.9629***	4.7719***	4.7856***	-1.3399	-1.4556	-1.4520	-1.3170	-1.3127
	(4.38)	(4.38)	(4.35)	(4.28)	(4.29)	(-1.18)	(-1.29)	(-1.28)	(-1.16)	(-1.15)
(Net Equity issuance/Assets)$_{t-1}$	-0.0994***	-0.0977***	-0.0980***	-0.0944***	-0.0946***	0.0288	0.0149	0.0156	0.0148	0.0153
	(-5.04)	(-4.95)	(-4.96)	(-4.82)	(-4.84)	(0.97)	(0.50)	(0.53)	(0.49)	(0.51)
(Net Debt issuance/Assets)$_{t-1}$	-0.1665***	-0.1651***	-0.1655***	-0.1662***	-0.1663***	0.0553***	0.0592***	0.0597***	0.0607***	0.0607***
	(-10.63)	(-10.56)	(-10.54)	(-10.56)	(-10.55)	(4.14)	(4.52)	(4.54)	(4.62)	(4.62)
Constant	27.081***	27.157***	26.530***	27.893***	28.642***	50.780***	50.557***	49.762***	50.671***	49.380***
	(3.89)	(3.90)	(3.80)	(4.01)	(4.10)	(8.72)	(8.78)	(8.69)	(8.68)	(8.60)
Control variables	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

Appendix I
Variable description

Variable	Description	Data source
	Cultural diversity	
Cultural diversity	An entropy cultural diversity measure: $\text{Cultural Diversity}_i = \sum_{j=1}^{J} \text{Distance}_{US,j} * N_j \ln(1/N_j)$, where N_j is the proportion of firm i 's subsidiaries located in country j to the number of firm i 's subsidiaries, $\text{Distance}_{US,j}$ is cultural distance between the U.S., the home country of the sample firms and country j, the country where firm i's subsidiary is located. $\text{Distance}_{US,j}$ is computed using an Euclidean version of formula that is based on the Hofstede's (2010) six cultural dimensions including: power distance index (PDI), uncertainty avoidance index (UAI), individualism index (IDV), masculinity index (MAS), long-term orientation (LTO), and Indulgence (IND). We also employ four alternative cultural measures. (1) GLOBE's (House et al, 2004) cultural dimensions. (2) Schwartz Egalitarianism scores (Siegel et al., 2011) of the 2005 release of the data set. (3) World Value Survey individualism scores. The average answer to question "Generally speaking, would you say that (1) Most people can be trusted (2) Need to be very careful". The scores are normalized between zero and one. (4) World Value Survey trust scores. The average answer to 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.	Orbis /Hofstede cultural dimensions (Hofstede, Hofstede and Minkov (2010). Schwartz Egalitarianism scores (Siegel et al., 2011) of the 2005 release of the data set. World Value Survey (http://www.worldvaluessurvey.org). GLOBE value dimensions House, Hanges, Javidan, Dorfman and Gupta (2004).
	Capital structure	
Book leverage ratio	The ratio of total debt divided by total book value of capital.	DataStream
Market leverage ratio	The ratio of total debt divided by book value of total debt plus market value of equity.	DataStream
Net equity issuance	Proceeds from sales of common and preferred equity minus retirements and repurchases of common and preferred equity, scaled by total assets.	Worldscope
Net debt issuance	Proceeds from long-term debt issuance minus amount of long-term debt reduction plus changes in short-term debt	Worldscope
	Control variables	
Growth opportunity	The natural log of market to book value.	DataStream
Profitability	The ratio of earnings before interest and taxes (EBIT) to total assets	DataStream
Tangibility	The ratio of tangible assets to total assets.	DataStream
Firm Size	The natural log form of total assets.	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.	DataStream
Geographic distance	The distance between capital cities of countries where subsidiaries operate and the capital city of the home country of the parent firm.	Orbis / 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 with the home country of the parent firm.	The World Factbook
Shared Language	The proportion of subsidiaries of a firm incorporated in the countries where the dominant language is the same with the home country of the parent firm.	The World Factbook
Shared Law	The proportion of subsidiaries of a firm incorporated in the countries where the legal origin is the same with the home country of the parent firm.	LLSV (1998)/ The World Factbook
Macroeconomic growth volatility	Standard deviations of GDP growth rate among countries where subsidiaries of a firm incorporates	Orbis /World Bank open database
Exchange rate volatility	Standard deviations of real exchange rate among countries where subsidiaries of a firm incorporates	Orbis /World Bank open database
Inflation volatility	Standard deviations of consumer price index (CPI) among countries where subsidiaries of a firm incorporates	Orbis /World Bank open database

Appendix II
Cultural diversity and speed of adjustments of capital structures

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. Cultural diversity is calculated as an entropy measure: $Cultural\ Diversity_{it} = \sum_{j=1}^{J} Distance_{US,j} * N_{ijt} ln(1/N_{ijt})$, where N_{ijt} is the proportion of firm i 's subsidiaries located in country j to the number of firm i 's subsidiaries at the end of the calendar 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 located. $Distance_{US,j}$ is computed using an Euclidean version of the Kogut and Singh (1988)'s 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). 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. See Appendix I for a description of these variables. We employ the system generalized method of moments (GMM) model Arellano and Bover (1995, Blundell and 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 level, respectively.

	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