

Multinationality and capital structure dynamics: A corporate governance explanation

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Abstract

This paper examines the impact of corporate governance on capital structure dynamics. Using ordinary least squares regressions on 17,496 firm-year observations for 2,294 US multinational companies (MNCs) over the period 1990–2018, we find that MNCs with strong corporate governance use more debt than those with weak governance. Furthermore, strong corporate governance is associated with a faster speed of adjustment to capital structure. This relationship is more pronounced for MNCs than domestic companies, and particularly for overlevered firms. We also use the two-part zero-inflated fractional regression model, instrumental variable, and structural equation model estimations to deal with any endogeneity concerns associated with the explanatory variables. Overall, our findings, which withstand a battery of robustness checks, suggest that improvements in corporate governance reduce the costs of monitoring for bondholders, resulting in increased debt financing.

Keywords: Multinationality, capital structure, speed of adjustment, corporate governance.

JEL classification: F23, G32, G34, G35

Declarations of interest: none

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1. Introduction

Prior research reports mixed results in the differences between leverage ratios of multinational corporations (MNCs) and domestic companies (DCs). Whilst some find that MNCs have lower ratios than DCs (Burgman, 1996; Doukas and Pantzalis, 2003), others find evidence to the contrary (Mittoo and Zhang, 2008). The difference in capital structure dynamics is also reflected in the slower speed of adjustment to capital structure by MNCs (McMillan and Camara, 2012). Overall, these differences have mostly been attributed to home and host countries factors that affect MNCs relative to their domestic counterparts. But most MNCs face significant governance issues because of the exposure to significant political risks and foreign exchange rate fluctuations (Burgman, 1996). Corporate governance forms an important element of the global competitiveness of MNCs (Buckley and Strange, 2011) and also affects their strategic choices (Filatotchev and Wright, 2011).

Yet, in spite of these important governance implications of being multinational, little is known about how the quality of corporate governance influences debt financing of multinational companies. Debt financing is an important strategic decision for MNCs because MNCs can parlay their valuable intangible assets, such as technology, patents and brand recognition to compete in international markets and get around capital market imperfections (Park et al., 2013).

In this paper, we examine the impact of corporate governance on the relationship between multinationality and capital structure dynamics for a sample of US companies over the period 1990-2018. Instead of simply assuming the presence of agency costs in MNCs, we directly employ corporate governance measures as a proxy for agency costs and test their influence on the leverage ratios and speed of adjustment to leverage of both domestic and multinational firms. We rely on the G-index (Gompers et al., 2003) and E-index (Bebchuk et al., 2009) to measure corporate governance, after controlling for other internal corporate governance factors, such as board size, board independence and CEO-duality. We also use different proxies for multinationality and leverage.

We begin our analysis by first re-examining the leverage differences between MNCs

and DCs and find that MNCs have lower leverage ratios. We then examine how the quality of corporate governance moderates the impact of multinationality on leverage. We find that MNCs with better corporate governance have higher leverage ratios than DCs. In other words, weak corporate governance of MNCs does not encourage high leverage as a monitoring mechanism for managerial excesses. This finding is consistent with the view that international diversification increases the complexity and costs of monitoring for bondholders, resulting in lower leverage for MNCs compared to DCs (Doukas and Pantzalis, 2003; Mittoo and Zhang, 2008). Bondholders would be more inclined to invest in corporate debt financing of MNCs with better governance to reduce the costs of monitoring. Our findings also reveal that MNCs with better corporate governance use longer-term debt.

We next investigate whether corporate governance influences the speed of adjustment to capital structure of MNCs. We split our sample into terciles based on the quality of corporate governance of both MNCs and DCs, i.e. weak governance, medium governance and strong governance. We find that in each group, firms with stronger corporate governance adjust more quickly to their target capital structure. However, the speed of adjustment is faster for MNCs with stronger corporate governance than for DCs with stronger corporate governance. This finding underscores the importance of strong corporate governance in explaining the differences in capital structure dynamics between DCs and MNCs.

In addition to using alternative proxies of corporate governance, leverage, and multinationality, we use different estimation techniques as robustness checks. Specifically, we address potential endogeneity concerns associated with our measures of multinationality and corporate governance variables. One may argue that since the leverage measures are fractional, a linear model does not deal with the inherent endogeneity bias across the explanatory variables (Papke and Wooldridge, 1996). We, therefore, re-estimate our baseline regressions using a two-part zero-inflated fractional regression model (Ramalho et al., 2011). This estimation reveals that corporate governance has no effect on the decision to use debt financing between DCs and MNCs. However, corporate governance

influences the amount of debt financing between DCs and MNCs. We also run instrumental variables (IV-2SLS and IV-GMM) and structural equation model (SEM) estimations and find that, in all cases, our main findings remain unchanged.

Our study makes several additional contributions to the literature. First, we document the mediating role of corporate governance on the relationship between multinationality and capital structure. Unlike previous studies that examine the capital structure of multinationals (Doukas and Pantzalis, 2003; Mittoo and Zhang, 2008; Park et al., 2013), to the best of our knowledge this is the only study that establishes the effects of corporate governance on the relationship between multinationality and capital structure dynamics. Second, we augment the analysis by Doukas and Pantzalis (2003) and Park et al. (2013) and reexamine the impact of corporate governance on the debt maturity of MNCs. Third, following Kieschnick and Moussawi (2018), we adopt a more robust empirical approach to test our hypotheses. Our results highlight how corporate governance influences the capital structure decisions of multinational firms compared to domestic firms.

The rest of our paper is organised as follows. Section 2 reviews relevant literature and formulates hypotheses, Section 3 describes the data used and definition of variables. Next, Section 4 discusses the estimation model and Section 5 presents the discussion on empirical results. Section 6 presents the robustness tests, Section 7 discusses the findings, and Section 8 concludes.

2. Prior literature and hypotheses

2.1. Multinationality, corporate governance and capital structure

International diversification enables firms to exploit growth opportunities, increase profitability, reduce costs of operation (Dunning, 1998), and exploit capital market imperfections (Park et al., 2013). MNCs, unlike DCs, have better opportunities to raise external capital in different markets (Stonehill et al., 1975), resulting in differences in their financial leverage.

The Ownership, Location and Internalisation (OLI) and agency theories both underpin the financing differences between MNCs and DCs. The OLI theory argues that

there are firm characteristics that drive international investments. According to [Dunning \(1995\)](#), ownership advantages, such as intangible assets (i.e. capacity, knowledge, finance, strong brand recognition, technology and patents), location advantages associated with institutional factors and internalization advantages, which help to exploit capital market imperfections, encourage internationalisation. These key characteristics culminate in multinational firms becoming more profitable and having higher growth opportunities and intangible assets, which are associated with low debt financing compared to domestic firms ([Park et al., 2013](#)). Capital structure studies confirm the relationship between these key capital structure determinants and leverage ([Ozkan, 2001](#); [Antoniou et al., 2008](#); [De Jong et al., 2008](#); [Li and Islam, 2019](#)).

According to the agency theory, misalignment of the interests of shareholders and bondholders results in agency costs of debt due to the risks associated with decisions that disadvantage bondholders ([Jensen and Meckling, 1976](#)). Two competing factors that explain the capital structure of multinational firms. On the one hand, MNCs are larger, have lower bankruptcy risks and cash flow volatility and higher profitability ([Mittoo and Zhang, 2008](#); [Park et al., 2013](#)). This implies MNCs can raise external debt more favourably and use debt as an instrument to hedge against exchange rate and political risk abroad ([Doukas and Pantzalis, 2003](#)). On the other hand, internationalisation is also associated with higher information asymmetry and monitoring costs, which increases agency costs of debt, resulting in lower debt financing ([Burgman, 1996](#); [Chen et al., 1997](#)). Thus, internationalisation exacerbates agency costs and limits the benefits of debt financing ([Doukas and Pantzalis, 2003](#); [Mittoo and Zhang, 2008](#)). The above factors explain why MNCs employ lower leverage relative to DCs ([Burgman, 1996](#); [Chen et al., 1997](#); [Doukas and Pantzalis, 2003](#); [McMillan and Camara, 2012](#)).

An important gap in the literature, though, relates to how the relationship between multinationality and capital structure reflects the nature and quality of corporate governance. Managers' pursuit of value-maximising goals can drive leverage decisions that do not advance the interests of shareholders and bondholders, and the quality of corporate governance can enhance or alleviate the impact on optimal leverage ([Jiraporn et al.,](#)

2012). For example, [Agha \(2013\)](#) finds that weaker governance minimises monitoring and encourages managers' discretionary expenses, and creditors interpret better governance indicators as firm quality, which reduces the cost of debt. Thus, better corporate governance reduces the opportunity for managers to engage in perquisites, leading to higher leverage ([Berger et al., 1997](#)).

Managers can use international diversification to advance their interests as with industrial diversification, thereby increasing agency costs ([Denis et al., 2002](#)). Moreover, [Doukas \(1995\)](#) and [Aabo et al. \(2015\)](#) discover evidence that capital markets interpret further investments in international markets as increasing agency costs. By operating in different countries, MNCs are impacted by different legal and institutional systems, which may have implications for their governance ([Filatotchev et al., 2019](#)). Therefore, [Chung and Zhang \(2011\)](#) argue that in countries where there is weak legal protection of investors, strong firm-level governance could serve as a substitute in assuring investor protection. If multinational firms have higher agency costs of debt which discourage the use of higher leverage and international governance can alleviate agency conflicts, we argue that good corporate governance reduces the complexities and costs of monitoring by bondholders. We, therefore, develop our first hypothesis as follows:

Hypothesis 1: *Multinational companies with stronger corporate governance are associated with higher levels of leverage.*

2.2. Multinationality and the speed of leverage adjustment

The trade-off theory proposes that optimal leverage is a trade-off between tax benefits of debt and bankruptcy costs ([Kraus and Litzenberger, 1973](#); [DeAngelo and Masulis, 1980](#); [Bradley et al., 1984](#)). This suggests that there is an optimal debt ratio that maximises firm value and firms will seek to rebalance capital structure when there is a deviation from the target.¹ According to [Graham and Harvey \(2001\)](#), CFOs consider target debt ratios when making capital structure decisions. However, the decision to adjust debt

¹Several studies examine the speed of adjustment of debt ratio to optimal capital structure. Such studies include [DeAngelo and Roll \(2015\)](#), [Flannery and Rangan \(2006\)](#), [Frank and Goyal \(2009\)](#), [Hovakimian et al. \(2001\)](#), [Huang and Ritter \(2009\)](#), [Leary and Roberts \(2005\)](#), and [Lemmon et al. \(2008\)](#)

ratio is impacted by adjustment costs and benefits associated with speed of adjustments (Korajczyk and Levy, 2003; Strebulaev, 2007). Chang et al. (2014) argue that the quality of corporate governance determines managers' approach to rebalancing debt ratio toward target capital structure. According to McMillan and Camara (2012), over-leverage or under-leverage can be derived from strategic decisions and have implications on the costs of capital. Overlevered firms can be perceived as risky, leading to an increased cost of capital and lower firm value, whereas managers of underlevered firms can be perceived to have low efficiency in utilising available resources to raise financing.

As argued earlier, MNCs face higher levels of agency costs due to the separation between home and host country managers and shareholders (Wright et al., 2002). As a result, MNCs are prone to higher agency cost of debt since operations in different jurisdictions increase information asymmetry and monitoring costs compared to domestic companies (Doukas and Pantzalis, 2003; Mittoo and Zhang, 2008). Therefore, shareholders adopt a range of corporate governance measures to minimise managerial opportunistic behaviour (Fama and Jensen, 1983; Jiraporn et al., 2012; Morellec et al., 2012). Chang et al. (2014) argue that adjustment costs are positively related to the agency conflicts between managers and equity holders, and report that firms with weak corporate governance adjust slowly to target debt ratio. Firms with strong corporate governance, on the other hand, use less debt (Berger et al., 1997; Jiraporn et al., 2012).

McMillan and Camara (2012) investigate the factors that explain the differences in the speed of adjustment for domestic and multinational firms and find that US MNCs have a slower adjustment speed to target debt ratio than domestic firms. The risks and opportunities associated with international diversification modify the effect of corporate governance on the speed of adjustments. Morellec et al. (2012) find that cost of debt to managers is three times as high as the cost of debt to shareholders mostly driven by the disciplinary effect of debt. Thus, we argue that when managerial interest dominates the interests of shareholders in the presence of weak corporate governance, adjustment to target debt ratio tends to be slower. Given that internationalisation increases agency costs, we expect that multinationality modifies the effect of corporate governance quality

on the speed of adjustment.

Hypothesis 2: *Multinational firms with strong corporate governance adjust faster to their target debt ratios than weak governance firms.*

3. Data

3.1. Sample data

We draw our sample from firms in the Centre for Research in Security Prices (CRISP) database for the period 1990–2018. We focus on this period because the database for our corporate governance variables, i.e. The Institutional Shareholder Services' (ISS) RiskMetrics (formerly IRRC), starts from 1990. We augment our corporate governance data with data on board characteristics (board size and composition) from the RiskMetrics Directors database and source accounting and financial information from Compustat North America. We restrict our sample to non-financial firms and winsorize all variables at the upper and bottom 1% to reduce the effects of outliers. This filtering gives a total sample of 17,496 firm-year observations for 2,294 firms.

3.2. Market and book leverage

We use market leverage as our main measure of leverage, which we compute as the ratio of total debt to total market value. We also use book leverage as a test of the robustness of our analysis, and compute this as the ratio of total debt to the total value of the firm. Following [Park et al. \(2013\)](#) and [Doukas and Pantzalis \(2003\)](#), we employ debt maturity as a proxy for leverage. For example, [Park et al. \(2013\)](#) explains that MNCs can use short-maturity debt as a disciplining tool that increases the degree of monitoring by the financial markets. However, entrenched managers can also use more long-maturity debt to avoid external monitoring. We employ three measures of debt maturity: % Long-term debt, % Short-term debt, and 3-year debt maturity. % Long-term debt is the proportion of long-term debt in total debt, and % Short-term debt is the proportion of short-term debt in total debt. 3-year debt maturity is the proportion of total debt maturing within three years ([Barclay et al., 2003](#); [Billett et al., 2007](#); [Park et al., 2013](#)).

3.3. Measures of multinationality

We use percentage of foreign sales (% Foreign sales) and a dummy based on the percentage of foreign sales (*MNC20 dummy*) as our main measures of multinationality. % Foreign sales denotes the ratio of foreign sales to consolidated sales for each firm-year and *MNC20 dummy* is equal to 1 if the % Foreign sales ratio is greater or equal to 20% and 0 otherwise.² Following [Park et al. \(2013\)](#), we adopt the 20% of foreign sales ratio classification to ensure that firms chosen in the multinational sample have a significant level of international exposure.

To confirm the robustness of our measures, we adopt alternative thresholds of multinationality at 10% (*MNC10 dummy*)³ and 50% (*MNC50 dummy*). *MNC10 dummy* is equal to 1 if the % Foreign sales ratio is greater or equal to 10% and 0 otherwise, and *MNC50 dummy* equals to 1 if the % Foreign sales is greater or equal to 50% and 0 otherwise. We also use foreign subsidiaries proxies as additional measures of multinationality ([Aabo et al., 2015](#); [Park et al., 2013](#)). Firms must have at least one subsidiary in a foreign country. % FSubs is the ratio of the number of foreign subsidiaries to the total number of subsidiaries, and No. FSubs ≥ 1 dummy is equal to 1 if the number of foreign subsidiaries is at least 1 and 0 otherwise.

3.4. Corporate governance measures

Prior research documents an inverse relationship between corporate governance and firms' leverage ratio ([Morellec et al., 2012](#); [Kieschnick and Moussawi, 2018](#)). Poor governance increases managerial discretion and hence agency costs. Firms, therefore, use more debt to constrain managers' ability to deploy free cash flow to value-destroying projects. However, MNCs face greater agency costs of debt than DCs, and are therefore more likely

²Multinationality can be measured by foreign sales ratios ([Aabo et al., 2015](#); [Doukas and Pantzalis, 2003](#); [Park et al., 2013](#)). Multinational capital structure studies adopt the 10% ([Doukas and Pantzalis, 2003](#); [Mittoo and Zhang, 2008](#)), 20% [Park et al. \(2013\)](#), 25% ([Burgman, 1996](#); [Lee and Kwok, 1988](#)), 30% ([Aabo et al., 2015](#)) and 50% ([Park et al., 2013](#)) thresholds for multinationality.

³The use of the 10% threshold follows [Hossain \(2008\)](#) and [Erel et al. \(2020\)](#) and consistent with SFAS No. 131, which stipulates that any U.S. public firms must report separately information about an operating segment if its reported revenue is 10% or more of the combined revenue of all reported operating segments.

to use less leverage (Doukas and Pantzalis, 2003). We discuss our corporate governance measures in the section below:

3.4.1. *G-index*

Our main corporate governance measure is the G-index metric by Gompers et al. (2003), which contains 24 governance rules that define the level of shareholder rights. We merge the two feeds of governance provisions and obtain 18 governance rules that are common in both feeds. The first feed sets out the governance provisions for the S&P 1500 companies for the years 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006. The second feed gives the governance data spanning the period 2007 to 2016 of our sample.

We follow the approach by Kieschnick and Moussawi (2018) and merge the two feeds after translating the second feed into their equivalent binary codes in the first feed. Using the state variable and the six state laws, we populate the entire governance data set. We only use the provisions that are common in the old and new feeds to compute the governance index. This filtering yields a total of 18 provisions that apply to both the 1990–2006 and 2007–2016 periods. Appendix A lists the 18 provisions constituting the Gindex.

Finally, we follow Giroud and Mueller (2011) and Morellec et al. (2012) and use the G-index from the latest available year for the intermediate years for the period 1990 to 2006. For example, G-index for 1991 and 1992 will be same as G-index in 1990; G-index in 1994 is the same as G-index in 1993; G-index in 1996 and 1997 is the same as G-index in 1995, and so on. Consistent with previous studies (Gompers et al., 2003; Giroud and Mueller, 2011; Morellec et al., 2012), a high G-index indicates weak governance (a lack of shareholder protection) whereas a low value suggests strong corporate governance.

3.4.2. *E-index*

We construct the E-index metric by Bebchuk et al. (2009), who assert that entrenchment insulates managers from discipline. Entrenched managers are likely to pursue interests to enhance perquisites. The E-index consists of 6 provisions listed in Appendix A. A high E-index indicates poor governance (a lack of shareholder protection).

3.5. Control variables

We control for other internal corporate governance measures:

3.5.1. Board size

We measure board size as the number of directors on the board. The size of a board has implications for the quality of corporate governance in the sense that larger boards tend to suffer from problems of poor communication and coordination (Jensen, 1993). Thus, the benefits of having larger boards are usually offset by the increased complexity and time associated with decision making (De Andres et al., 2005). As a result, there is an inverse correlation between board size and the strength of board monitoring of management (Kieschnick and Moussawi, 2018).

3.5.2. Board independence

We compute this as the fraction of directors who are outsiders. A high proportion of outsiders on the board limits managerial excesses and minimises the agency problem and its consequent impact on firm debt levels (Kieschnick and Moussawi, 2018).

3.5.3. CEO Duality

CEO duality is a dummy variable that takes on the value of 1 if the CEO is also chairman of the board and 0 otherwise. Some studies suggest CEO who is also the chairman of the board possess increased power to expropriate minority shareholders through “tunnelling” due to the diminished ability of the board to monitor and discipline management (Fama and Jensen, 1983; Johnson et al., 2000).

Also, in line with previous studies Frank and Goyal (2009); Kieschnick and Moussawi (2018); Park et al. (2013), we include a number of firm financial variables briefly explained as follows:

3.5.4. Industry leverage

This is the median of market leverage for different industries by year where industry is defined using the Fama and French (1997) 48 industry classifications. This allows us to capture the peer influence on capital structure decisions.

3.5.5. MB ratio

Market-to-Book (MB ratio) is the ratio of the market value of the firm to its book value and is an important determinant of financing decisions as it reflects growth prospects.

3.5.6. Firm size

We control for firm size, computed as the log of the total assets of the firm, to reflect a firm's access to capital and its level of financial constraints.

3.5.7. Dividend payout

This is computed as the ratio of cash dividends to net income. Dividends may be a way to manage the use of debt capacity as firms with large increases in dividends may have higher levels of debt ([Cooper and Lambertides, 2018](#)).

3.5.8. Free cash flow

We also control for free cash flow since its relationship to debt is demonstrated in the ability of debt to act as a disciplining mechanism in curbing the misuse of free cash flow by managers ([Jensen, 1986](#)).

3.5.9. Return on assets

Return on assets is computed as the ratio of operating income before depreciation to total assets. We include this as a measure of firm profitability since profitable companies could use less or more debt in line with the pecking order or agency theory respectively.

3.5.10. Asset Tangibility

This is computed as the ratio of net property, plant and equipment to total assets and indicates the amount of collateral a firm might use to access debt financing.

3.5.11. Asset maturity

We measure this as current assets divided by cost of goods sold plus property, plant and equipment divided by depreciation. We control for asset maturity in line with [Park et al. \(2013\)](#) and [Chen et al. \(2020\)](#) who document its impact on leverage dynamics.

3.5.12. R&D expenditure

This is computed as research and development to total assets and reflects the amount of a firm's intangible assets.

3.5.13. Capital expenditure

We include capital expenditure, measured as the ratio of capital expenditure to total assets to take account of the level of corporate investment.

3.6. Summary statistics

Panel A of Table 1 reports the summary statistics of firm-specific variables used in the regression models. Panel B provides the summary statistics for the corporate governance variables, which are the G-index and E-index, Board size, Board independence, and CEO-duality. As shown in Panel A, on average foreign sales represent about 28.2% of total sales, the mean value of market leverage is 17.0%, and that of book leverage is 20.8%. % Short-term debt and % Long-term debt are 16.5% and 71.4%, respectively, indicating that firms utilise more long-term than short-term debt financing. 3-year debt maturity, which represents debt maturing within three years, is 23.2%. The debt ratios are comparable to the industry median leverage ratio of 20.7%. The average market-to-book ratio is 2.128, firm size ($\ln(\text{Assets})$) is 7.527, and the average firm is about 28 years old. Average dividend payout ratio is 18.0%, free cash flow is 6.5% of total assets, and return on assets is 6.0%. Tangible assets constitute about 81.1% of total assets and it takes about 10 years for assets to mature. The mean R&D expenditure and capital expenditure are 3.1% and 5.3% of total assets, respectively.

PLEASE INSERT TABLE 1 HERE

Panel B reports average G-index of 7.710 and E-index of 2.803. These measures provide preliminary evidence of weak corporate governance and managerial entrenchment associated with our sample. With a board size of 9 people, the average percentage of independent members of the board is 73.1%, which suggests possible insider influence on

corporate decisions. The sample also shows that about 60.4% of CEOs of the sample firms are also board chairmen. The firm characteristics and corporate governance measures provide some indications of agency problems and likely adverse impact on capital structure decisions.

3.7. Univariate analysis

Before analyzing the effects of corporate governance on leverage ratios of MNCs and DCs, we compare the firm characteristics and corporate governance measures of DCs and MNCs. This is reported in Table 2. We observe that DCs have higher market leverage, book leverage and % Long-term debt than MNCs. The mean difference of the leverage ratios is statistically significant, indicating that MNCs are conservative in their debt financing compared to DCs. However, % Short-term debt for MNCs are significantly higher than for DCs. Similar to [Park et al. \(2013\)](#), we find no evidence that MNCs use more debt maturing within three years than DCs.

PLEASE INSERT TABLE 2 HERE

We also observe that MNCs have a higher market-to-book ratio, are larger and older than DCs. DCs tend to invest more in capital projects than MNCs but MNCs spend more on R&D than DCs. The G-index and E-index are higher for MNCs than DCs, indicating potential weaker corporate governance associated with MNCs. MNCs have larger boards and more independent directors than DCs. These governance features of MNCs compared with DCs are consistent with the theoretical argument that the geographical diversification undermines good governance. However, it is not immediately evident whether the effects of corporate governance encourages MNCs to use more debt. [Arping and Sautner \(2010\)](#) argue that the value of debt as a disciplining device reduces as corporate governance improves. Our empirical analysis sheds light on this phenomenon.

4. Methodology

4.1. Leverage ratio

We test for the impact of corporate governance on the capital structure of MNCs by estimating the moderating effects of corporate governance on the relationship between multinationality and capital structure using the following OLS model:

$$Lev_{it} = \alpha_{it} + \beta_1 MNC_{it} + \beta_2 Gov_{it} + \beta_3 (MNC_{it} \times Gov_{it}) + \beta_i Cont_{it} + \mu_{it}, \quad (1)$$

where Lev_{it} is either market leverage, book leverage, % long-term debt, % short-term debt, and 3-year debt maturity; MNC_t is the proxy for multinationality using the percent foreign sales (*% Foreign sales*) and the 20% cut-off dummy (*MNC20 dummy*); Gov_{it} is the proxy for corporate governance variables described in previous sections; and $MNC_{it} \times GOV_{it}$ is the interaction between multinationality and corporate governance. $CONT_{it}$ include industry leverage, market-to-book ratio, firm size ($\ln(\text{Assets})$), asset tangibility, profitability, capital expenditure, firm age, stock returns and marginal tax rate. Finally, μ_{it} is the firm-year specific error term. We also control for industry and year fixed effects.

4.2. Speed of adjustment

We use two alternative models to determine the speed of adjustment: a two-stage model and a reduced-form model.

4.2.1. Two-stage approach

We first estimate the first-stage model to determine each firm's target leverage ratio, which may vary over time. The target leverage, (Lev_{it+1}^*), is the fitted value of the regression using Equation (2).

$$Lev_{it+1} = \beta_1 MNC_{it} + \beta_2 Gov_{it} + \beta_3 (MNC_{it} \times Gov_{it}) + \beta_i Cont_{it} + v_{1,it+1}, \quad (2)$$

where Lev_{1+it} is one-year forward market leverage; MNC_t is the proxy for multinationality using the 20% cut-off dummy (*MNC20 dummy*); Gov_{it} is the proxy for corporate governance ($\ln(\text{G-index})$); and $MNC_{it} \times GOV_{it}$ is the interaction between multinationality and

corporate governance. $CONT_{it}$ is the vector of firm variables; $v_{1,it+1}$ is the disturbance term with a zero mean and constant variance, and it is uncorrelated with the regressors; and β_1 , β_2 , and β_3 are unknown parameters. We also control for industry and year fixed effects. Our primary target measure is the fitted value, (Lev_{it+1}^*) , from the regression specified by Equation (2).

In the second step, we estimate a partial adjustment model to analyse how rapidly MNCs and DCs adjust from their current leverage to their target leverage decisions in the presence of corporate governance. In the presence of adjustment costs, firms would not be able to fully and continuously adjust their leverage ratio. Similar to [Fama and French \(2002\)](#), [Kayhan and Titman \(2007\)](#), and [Devos et al. \(2017\)](#), we apply a standard partial adjustment model as follows:

$$Lev_{it+1} - Lev_{it} = \delta(Lev_{it+1}^* - Lev_{it}) + v_{2,it+1}, \quad (3)$$

where $v_{2,it+1}$ is the disturbance term uncorrelated with the regressors; and δ represents the leverage adjustment speed, deviating away from the firm's next-period target leverage. δ lies between 0 and 1, with a value of $\delta = 1$ indicating that the firm fully adjusts for any deviation away from its target leverage immediately, and $\delta < 1$ implying persistent, undesired leverage ratios in the presence of adjustment costs. The gap between the desired and actual leverage levels should decrease over time, provided δ is greater than zero.

4.2.2. Reduced-form approach

Following [Flannery and Rangan \(2006\)](#) and [Chang et al. \(2014\)](#), we estimate adjustment speed in a single step by substituting Equation (2) into Equation (3) to obtain a reduced-form dynamic partial adjustment capital structure model in Equation (4).

$$Lev_{it+1} = \delta\beta_1 MNC_{it} + \delta\beta_2 Gov_{it} + \delta\beta_3(MNC_{it} \times Gov_{it}) + \delta\beta_i Cont_{it} + (1 - \delta)Lev_{it} + \epsilon_{1,it+1}, \quad (4)$$

where equation, $\epsilon_{1,it+1}$ is the error term uncorrelated with the regressors, and the coef-

ficient on the lagged leverage ratio is $(1-\delta)$, where δ is the proportion of deviation from target leverage adjusted from period t to period $t + 1$. Because the lagged dependent variable is usually correlated with the error term, we first regress Lev_{it} on the lagged market leverage and the control variables from Equation (2). The variable Lev_{it} on the right-hand side of Equation (4) can then be substituted for by its fitted value, (Lev_{it+1}^*) .

An important concern in estimating Equations (2), (3), and (4) is that the target leverage ratio, Lev_{it+1}^* , is unobservable, and the entire set of its determinants is neither known nor fully observable (Chang et al., 2014). Therefore, Lev_{it+1}^* is measured with an error, leading to a biased estimate of the adjustment speed in both models. We mitigate this concern by including industry fixed effects, which vary only across industries and are constant over time. In addition, the year dummies control for and absorb any omitted time-varying influences on capital structure. For all regression models, we correct the standard errors for the presence of heteroskedasticity and clustering in error terms.

5. Empirical results

5.1. Multinationality, corporate governance, and leverage

Table 3 reports estimates of Equation (1), which tests (Hypothesis 1). The existing literature suggests that MNCs use less debt compared to DCs (Doukas and Pantzalis, 2003; Mittoo and Zhang, 2008; McMillan and Camara, 2012). This evidence rests on the argument that internationalisation raises the monitoring costs for bondholders, thus undermining the role of debt as a disciplining device to temper managerial excesses. Since Arping and Sautner (2010) argue that improvements in corporate governance reduce the role of debt capital in curtailing agency costs, we are interested in exploring how corporate governance moderates the relationship between multinationality and capital structure.

PLEASE INSERT TABLE 3 HERE

The dependent variable is market leverage. We use two measures of multinationality as the independent variable: % Foreign sales and MNC20 dummy (MNC20 dummy equals

1 if the % Foreign sales is at least 20% and 0 otherwise). The proxy for corporate governance is the augmented G-index by [Kieschnick and Moussawi \(2018\)](#), after controlling for board size ($\ln(\text{Board size})$), board independence, and CEO-duality. High value (positive coefficient) of G-index implies weak corporate governance whereas a lower value (negative coefficient) of G-index denotes a strong corporate governance. We include several control variables in the regression estimations including industry leverage, market-to-book ratio, firm size ($\ln(\text{Assets})$), firm age, dividend payout, free cash flow, return on assets, asset tangibility, asset maturity, R&D expenditure, and capital expenditure.

The results in Columns (1)–(3) are the regression outputs when we use % Foreign sales to measure multinationality, and Columns (4)–(6) are the output for MNC20 dummy measure of multinationality. We find a statistically significant negative coefficient for %Foreign sales (Columns (1)&(2)) and MNC20 dummy (Columns (4)&(5)). The sign of the coefficients changes to positive only after controlling for the interaction between corporate governance and multinationality. The coefficients of $\ln(\text{G-index})$ are positive and significant at either the 1% or 5% level, indicating that leverage increases as governance quality deteriorates ([Arping and Sautner, 2010](#)). We find similar negative effects of CEO-duality on leverage ratios as [Kieschnick and Moussawi \(2018\)](#).

Next, we examine how corporate governance moderates the relationship between multinationality and leverage. In addition to the effects of the legal, economic, cultural and political institutions on the corporate decisions of MNCs ([Cumming et al., 2017](#)), firm-level governance mechanisms also have a material impact on MNCs decisions ([Filatotchev et al., 2019](#)). The coefficients of the interaction terms % Foreign sales \times $\ln(\text{Gindex})$ and MNC20 dummy \times $\ln(\text{Gindex})$ are negative and statistically significant at the 1% level. This result indicates that MNCs with weak governance have lower leverage ratios. In other words, MNCs with strong corporate governance tend to use more debt financing. We interpret this finding similar to [Doukas and Pantzalis \(2003\)](#), who assert that the lower leverage of MNCs is because bondholders find it difficult and expensive to monitor MNCs. Overall, we find support for Hypothesis 1, that MNCs with strong corporate governance are associated with higher leverage ratios.

Industry leverage loads positively on firm leverage, and the market-to-book ratio has a negative relationship with the leverage ratio. Large firms and firms with tangible assets report higher leverage ratios, and profitability is associated with negative leverage. Firm age is negatively related to leverage. This is consistent with the view that firms take on more debt as they age because of the increase in assets-in-place rather than growth opportunities (Hovakimian et al., 2001; Sundaresan et al., 2015). Overall, our findings in Table 3 highlight the argument that although the complexity of corporate governance increases with geographical diversification, it does not lead to increased debt as a disciplining tool to alleviate agency problems. Rather, geographic diversification increases the costs of monitoring for bondholders, which results in lower leverage of MNCs with weak corporate governance.

5.2. Debt maturity and MNCs

Next, we consider whether the maturity of debt capital differs between MNCs and DCs. We use three measures proxy for debt maturity: % Short-term debt, 3-year debt maturity (debt due within three years), and % Long-term debt. There are two competing arguments for how short-maturity debt influences managerial excesses. On the one hand, short-maturity debt increases managerial monitoring and reduces agency conflicts. On the other hand, entrenched managers within MNCs can avoid the discipline of short-maturity debt by decreasing short-term debt in favour of long-term debt.

Table 4 reports the results of the influence of corporate governance on debt maturity of MNCs for % Short-term debt (Columns (1)–(4)), 3-year debt maturity (Columns (5)–(8)), and % Long-term debt (Columns (9)–(12)). First, we find a significantly positive effect of multinationality on % Short-term debt. However, we observe that there is a negative relationship between multinationality and 3-year debt maturity and % Long-term debt. Using $\ln(\text{G-index})$ as a proxy for corporate governance, we find a significant negative effect of corporate governance on the % Short-term debt, but a positive effect on % Long-term debt. In other words, strong corporate governance is associated with short-term debt while weak corporate governance is related to long-term debt as a way to avoid the disciplining effects of short-term debt (Park et al., 2013).

PLEASE INSERT TABLE 4 HERE

We then interact our measures of multinationality with the corporate governance proxy ($\% \text{ Foreign sales} \times \ln(\text{Gindex})$ and $\text{MNC20 dummy} \times \ln(\text{Gindex})$). The coefficients on the interaction terms in Columns (2)&(4) are significantly negatively related to $\% \text{ Short-term debt}$, indicating that MNCs with weak corporate governance use less short-term debt. However, we find a significantly positive relationship between the interaction terms and both 3-year debt maturity (Columns (6)&(8)) and $\% \text{ Long-term debt}$ (Columns (10)&(12)). This evidence suggests that MNCs with weak corporate governance use more long-term debt than DCs. Thus, poorly governed MNCs have low short-term debt. In other words, as managerial entrenchment increases with the degree of multinationality, the incentives to reduce the disciplining effects of short-term debt increases.

These findings support the earlier results of the effects of corporate governance on market leverage for MNCs. While we find higher $\% \text{ Short-term debt}$ for MNCs, our evidence indicates that this only occurs when these MNCs are better governed. In other words, MNCs use short-term debt not necessarily as a discipline tool to increase monitoring and reduce agency costs.

5.3. Multinationality and the speed of leverage adjustment

In this section, we explore whether corporate governance influences the speed of adjustment to capital structure of MNCs and DCs. We follow prior studies and adopt two approaches to determine the speed of adjustment (Chang et al., 2014; Devos et al., 2017). We run separate regressions for DCs (Columns (1)–(3)) and MNCs (Columns (4)–(6)) after partitioning the sample according to the quality of corporate governance. Here, the corporate governance measure, G-index, is split into terciles, where the highest tercile indicates weak governance, median tercile is medium governance, and lowest tercile represents strong governance.

In Panel A of Table 5, we report the results from the two-stage model in Equation 3.⁴ The independent variable measures the speed of adjustment to target leverage. For both DCs and MNCs, the results indicate that strong corporate governance is associated with faster speed of adjustment to target leverage. It further shows that compared to DCs, MNCs report faster adjustment speed, especially when corporate governance is strong.

PLEASE INSERT TABLE 5 HERE

We find similar results when estimating the speed of adjustment from the reduced-form model using Equation 4. Here, the variable of interest is $1-\delta$, where a lower value indicates a faster speed of adjustment and vice versa. Generally, the quality of corporate governance is positively related to the speed of adjustment to target leverage. Again, compared to DCs, MNCs report lower coefficients of $1-\delta$, indicating that the value of δ is higher. This implies that MNCs have a faster speed of adjustment when corporate governance is stronger. Our results show that corporate governance explains the differences in both the leverage ratio and the speed of adjustment to target leverage ratio of MNCs and DCs.

Next, we examine the speed of adjustment of underlevered and overlevered DCs and MNCs. Chang et al. (2014) find that the disciplinary role of debt enjoins overlevered (underlevered) firms with weak corporate governance to adjust at a faster (slower) pace towards target leverage compared to those with strong corporate governance. Following Berger et al. (1997), we define a firm as overlevered (underlevered) if its leverage is above (below) the target leverage. We estimate separate regressions for underlevered and overlevered DCs and MNCs and for weak, medium and strong corporate governance using the reduced-form model. These results are reported in Table 6.

PLEASE INSERT TABLE 6 HERE

Panel A of Table 6 shows the estimates of the reduced-form model in Equation 4 for

⁴For brevity we do not report the first stage results for estimating the target leverage.

the adjustment speed for the underlevered firms. We find that the coefficients of the lagged market leverage ($1-\delta$) are higher for weak governance DCs than strong governance DCs. A higher $1-\delta$ implies a lower δ , suggesting a slower speed of adjustment. This result indicates that DCs with strong corporate governance adjust their leverage at a faster pace than their weak corporate governance counterparts. The results are similar when we compare the speed of adjustment of MNCs with weak corporate governance against those with strong corporate governance. More importantly, our results show that MNCs with strong corporate governance tend to adjust more quickly towards target leverage compared to DCs with strong corporate governance.

For overlevered firms, our results reported in Panel B of Table 6, show that DCs with weak corporate governance tend to adjust at a faster pace towards target leverage compared to those with strong corporate governance. Similarly, overlevered MNCs with weak corporate governance have a faster speed of adjustment than those with strong corporate governance. However, for strong corporate governance firms, overlevered MNCs tend to adjust towards target leverage at a faster pace than comparable DCs. Finally, overlevered firms - both DCs and MNCs - tend to adjust more quickly towards target leverage compared to their underlevered counterparts. Overall, overlevered firms tend to adjust more quickly toward target leverage compared to underlevered firms.

These results indicate that corporate governance influences the speed of adjustment to capital structure between of MNCs and DCSs, with the impact being more pronounced for MNCs . We also find that the disciplinary role of debt dominates the takeover defense argument in explaining the speed of adjustment. Thus, overlevered firms with weak corporate governance adjust more quickly toward target leverage, compared to firms with strong corporate governance, especially for MNCs. Correspondingly, underlevered firms with weak corporate governance tend to adjust more slowly toward target leverage, compared with their strong governance counterparts, especially when the firm is a multinational.

6. Robustness checks

6.1. Zero-inflated fractional regressions

In our first robustness test, we estimate a two-part zero-inflated fractional regression model (Ramalho et al., 2011; Papke and Wooldridge, 2008) to analyse whether and to what extent firms use debt (Strebulaev and Yang, 2013; Kieschnick and Moussawi, 2018). Using a censored or linear regression ignores this critical distinction. This approach further captures the possibility that some firms are all-equity firms, with zero leverage.

Table 7 provides the results of the two-part zero-inflated fractional regression model. Panel A is the first-part logit regression, which tests the decision to use debt financing. Columns (1)–(3) are the results when MNCs is defined as % Foreign sales and Columns (4)–(6) for MNC20 dummy. The negative coefficients of % Foreign sales provide some evidence that MNCs are less likely to use debt financing. The evidence also indicates that weak governance increases the probability of using debt capital to mitigate agency costs. However, the insignificant coefficients of the interaction terms in Columns (3)&(6) indicate no effects of corporate governance on the decision to use debt between MNCs and DCs.

PLEASE INSERT TABLE 7 HERE

Panel B shows the results for the second part GLS regression, which estimates how much debt a firm uses given the decision to use debt. Similar to the baseline results, MNCs use less debt financing than DCs, and there is some evidence that weak corporate governance is positively related to leverage ratios. More importantly, the negative coefficients of the interaction term between corporate governance and multinationality indicate that MNCs with weak corporate governance utilise less debt. In other words, MNCs do not use leverage to minimise agency costs. Stated differently, the results show that strong governance MNCs use more debt, suggesting that strong corporate governance reduces the costs of active monitoring, encouraging bondholders to invest in the debt financing of MNCs compared to DCs.

6.2. Alternative estimations: IV-2SLS, IV-GMM, and SEM

To address endogeneity concerns associated with our corporate governance measure, we run two alternative instrumental variables estimations - IV-2SLS and IV-GMM. Following [Kieschnick and Moussawi \(2018\)](#), we use the states of incorporation as instruments to satisfy the relevance and exclusion restriction conditions. First, state law controls the provisions in the corporate charter, which defines different anti-takeover provisions across states. Second, the provisions in the corporate charter, as espoused in the state corporate law, are likely to influence other governance structures. Third, it is unlikely that the state of incorporation correlates with capital structure decisions. The impact on capital structure might have more to do with the headquarters of the firm rather than the state of incorporation. We also include lagged measures of multinationality as instruments for possible endogeneity stemming from our measure of multinationality.

Table 8 provides the results for the IV-2SLS in Columns (1)–(4) and IV-GMM in Columns (5)–(8). The independent variables of the IV-2SLS for multinationality (% Foreign sales and MNC 20%) and $\ln(\text{G-index})$ are based on the predicted values from the first stage regressions. We include the control variables as in the baseline regression models and both year and industry dummies. The significant negative coefficients of % Foreign sales and MNC 20% in Columns (1)&(3) for IV-2SLS and Columns (5)&(7) for the IV-GMM regressions show that multinationality is associated with lower leverage ratios. Multinationality increases leverage only after controlling for the measure of corporate governance. We also find that, in general, poor corporate governance is associated with higher leverage ratios. This evidence is consistent with the argument in the extant literature that debt financing plays a significant monitoring and disciplinary role in the absence of strong corporate governance ([Berger et al., 1997](#); [Jiraporn et al., 2012](#); [Agha, 2013](#)).

PLEASE INSERT TABLE 8 HERE

Similar to our main results, we find a significant negative coefficients for the interac-

tion terms % Foreign sales \times ln(G-index) and MNC 20% \times ln(G-index) for the IV-2SLS (Columns (2)&(4)) and IV-GMM (Columns (6)&(8)) regressions. These results corroborate our earlier findings that weak governed MNCs are associated with lower leverage. In other words, MNCs with strong corporate governance have higher leverage than those with weak governance. The results also imply that DCs with weak governance rely on high leverage to mitigate the effects of agency costs. Thus, our baseline results are robust to controlling for endogeneity concerns associated with the measures of corporate governance and multinationality.

Next, we estimate a structural equation model (SEM) to perform a path analysis for the channels through which multinationality affects market leverage. Here, we use the measure of corporate governance (ln(G-index)) as the mediating variable (MV) that determines a firm’s leverage ratio through its level of multinationality.⁵ Following the delta method (Oehlert, 1992; Mensah and Tsang, 2020), we estimate the indirect effect as the product of the effect of the mediating variable on leverage and the effect of multinationality on the mediating variable. We report the results for the direct effect of multinationality (% Foreign sales and MNC 20%) on firms’ leverage ratios and for the indirect effect of multinationality on firms’ leverage ratios through the mediating variable, corporate governance (ln(G-index)). The results are reported in Table 9.

PLEASE INSERT TABLE 9 HERE

The results in Table 9 show that there is both a direct and indirect effect of multinationality on a firm’s leverage. Specifically, multinationality as a standalone variable is associated with lower leverage. The evidence on the mediating role of corporate governance suggests that even though multinationality in itself determines a firm’s leverage ratio, corporate governance on a firm’s level of multinationality can also explain the lever-

⁵This estimation also addresses any potential measurement errors associated with the variables when estimating OLS regressions. By estimating parameters with full information maximum likelihood (FIML), the SEM provides consistent and asymptotically efficient estimates (Titman and Wessels, 1988; Maddala and Nimalendran, 1996; Chang et al., 2009).

age decisions. Thus, through the indirect impact of corporate governance, we still find that multinationality is positively related to leverage. The evidence on the mediating role of corporate governance is consistent with the baseline results. Multinational firms use more debt when corporate governance is strong (Doukas and Pantzalis, 2003).

6.3. Alternative proxies for governance, leverage and MNC

We re-run our baseline model using book leverage as the dependent variable and report the results in Table 10. The coefficients of the proxies for multinationality are significantly negative in the regressions without the interaction terms. $\ln(\text{G-index})$ negatively affects book leverage, indicating that poor governance is associated with higher debt financing. The coefficients of the interaction terms between multinationality and corporate governance are negative and significant. Overall, we confirm our earlier results that leverage is not used to reduce agency costs within multinational firms.

PLEASE INSERT TABLE 10 HERE

Table 11 reports the results of the main model using an alternative measure of corporate governance. Following Giroud and Mueller (2011) and Kieschnick and Moussawi (2018), we use the entrenchment index (E-index) by Bebchuk et al. (2009) as an alternative measure of corporate governance, which directly measures managerial entrenchment and hence agency costs. We re-run our baseline model using market leverage as the dependent variable, % foreign sales and MNC20 dummy as proxies for multinationality, and the same control variables. Year dummies and industry are included to capture any year and industry-specific effects.

PLEASE INSERT TABLE 11 HERE

Our results remain the same after replacing $\ln(\text{G-index})$ with $\ln(\text{E-index})$ to measure managerial entrenchment and corporate governance. The coefficients of % Foreign sales and MNC20 dummy in Columns (1) and (3) are both negative and statistically

significant. $\ln(\text{E-index})$ is not significant, except in Column (2) indicating little effects of entrenchment effects on leverage ratios. The coefficients of the interaction terms are significantly negative suggesting, that poor governance or managerial entrenchment is associated with lower leverage for MNCs. Again, we interpret this result to mean that MNCs with managerial entrenchment effects reduce leverage ratios to minimise external monitoring.

In Table 12, we use additional proxies for multinationality and re-estimate our baseline model for the impact of corporate governance on leverage ratios of MNCs. We create two dummy variables: MNC 10% , which takes the value of 1 if the % Foreign sales is greater than or equal to 10%, and 0 otherwise (Erel et al., 2020) and MNC 50%, which takes the value of 1 if % Foreign sales is greater than or equal to 50%, and 0 otherwise (Park et al., 2013). Using data on the number of domestic and foreign subsidiaries from the Orbis database, and following (Denis et al., 2002; Aabo et al., 2015; Chang et al., 2016), we create two additional proxies for MNCs; % FSubs, which is the ratio of the number of foreign subsidiaries to the total number of subsidiaries, and No. FSubs, which is a dummy variable equal to 1 if the number of foreign subsidiaries is greater or equal to 1. These two measures emphasise the depth of the degree of multinationality.

PLEASE INSERT TABLE 12 HERE

Columns (1)–(8) use market leverage as the dependent variable, whereas book leverage is the dependent variable in Columns (9)–(16). Similar to the results in Tables 3 and 11, multinationality is associated with lower market and book leverage without the interaction terms. We also find a positive relationship between $\ln(\text{Gindex})$ and the leverage ratios, indicating that poor governance is associated with higher leverage. However, the negative coefficients on the interaction terms suggest that MNCs with better corporate governance report higher leverage ratios. In other words, leverage seems to be used as a disciplining tool to check managerial excesses in domestic firms but not MNCs.

7. Discussion

Multinational firms have lower leverage due to increased complexities, information asymmetry, monitoring and agency costs associated with internationalisation (Doukas and Pantzalis, 2003; Mittoo and Zhang, 2008). Agency costs explain the lower leverage of multinational firms (Doukas and Pantzalis, 2003; Mittoo and Zhang, 2008; Aabo et al., 2015). Although internationalisation offers multinational firms more opportunities to raise external capital relative to domestic firms (Park et al., 2013), the increase in monitoring costs is likely to diminish the beneficial role of debt financing as a disciplinary mechanism in curtailing managerial excesses (Burgman, 1996; Chen et al., 1997; Doukas and Pantzalis, 2003; Mittoo and Zhang, 2008). Jones et al. (2020) find evidence that managers choose greater equity financing over debt as internationalisation increases because of the impact of agency costs and the choice of managerial flexibility. The quality of corporate governance mechanisms affects the agency costs associated with debt capital (Jiraporn et al., 2012), as better governance minimises managerial opportunism and reduces cost of debt (Berger et al., 1997; Agha, 2013). Thus, better corporate governance enhances the debt raising capacity of multinational firms.

Our initial evidence supports the view that generally, multinational firms employ lower leverage than their domestic counterparts. This indicates that monitoring and agency costs associated with internationalisation provide a disincentive to the use of debt. The findings also align with the Transaction Cost Economics (TCE) of Williamson (1988) which argues that debt and equity capital are forms of governance mechanisms but not merely financial instruments. In this sense, debt financing serves as a disciplinary tool in mitigating managerial excesses (Agha, 2013), and corporate governance mechanisms offer systems that seek to discourage managerial opportunism (Filatotchev and Wright, 2011). Our empirical evidence therefore advances the notion that debt financing and the quality of corporate governance can be substitutes. We find that weaker corporate governance increases leverage, indicating a negative relationship between the quality of corporate governance and capital structure. But more importantly, we find that multinational firms with weak corporate governance have lower leverage, a clear contrast to the

negative relationship between corporate governance quality and capital structure. Thus, while agency costs associated with internationalisation reduces leverage, better corporate governance which indicates lower agency costs provide incentives for the use of debt financing.

Having established the moderating effect of corporate governance on the capital structure decisions of multinational firms, we further examine how this affects their debt maturity decisions. Generally, short-term debt offers debt holders the opportunity and flexibility to monitor firms through contractual terms of frequent repayment and refinancing (Rajan and Winton, 1995; Demirgüç-Kunt and Maksimovic, 1999), and this minimises agency costs between shareholders and managers (Stulz, 2001; Datta et al., 2005). As such, managers of firms with weaker corporate governance seek to minimise external scrutiny by choosing more long-term debt over short-term debt (Jiraporn and Kitsabunnarat, 2007). Our evidence indicates that multinational firms with strong corporate governance are likely to employ short-term debt, on the other hand to mitigate the disciplinary impact of debt, multinational firms with weaker corporate governance tend to employ long-term debt compared to domestic firms. This makes a strong case for the effect of managerial entrenchment on the choice of debt maturity, particularly for multinational firms facing higher agency costs.

Finally, the quality of corporate governance also has implications on firms' speed of adjustments to target debt ratios (Morellec et al., 2012). The costs of adjustments to target debt ratio is directly affected by the nature of agency costs associated with the misalignment of interests between managers and shareholders (Chang et al., 2014). This indicates that the speed of adjustment is slower for firms with weak corporate governance, because managers are more inclined to pursue their interests at the expense of shareholder interests. The evidence suggests that strong corporate governance is associated with faster speed of adjustment for both multinational and domestic firms with the relationship more pronounced for multinational firms. The results indicate that the monitoring effect of strong corporate governance outweighs the impact of agency costs on capital structure decisions, even in the case of multinational firms characterised by

higher agency costs.

8. Conclusion

The complexities of operations and shareholding structure of MNCs mean that they face more significant agency problems. This effect is exacerbated by differences in political risks and the national culture and experiences of managers. On the one hand, greater agency costs should lead to greater use of debt by MNCs. On the other hand, higher costs of monitoring and institutional risk factors associated with internationalisation intensify the risks of bankruptcy, which leads to lower use of leverage. Also, MNCs accumulate intangible assets that produce high profitability and high growth potential leading to lower leverage. What is relatively under-explored in earlier studies is how corporate governance affects the nexus between multinationality and leverage.

In line with prior evidence, we find that MNCs employ less debt than DCs. We further find evidence that poor corporate governance is associated with higher leverage. But more importantly, the results support our central prediction that MNCs with strong corporate governance use more debt capital. We also observe that speed of adjustment to capital structure is more pronounced for MNCs with stronger corporate governance. Overall, these findings demonstrate that corporate governance moderates the effects of agency costs of debt on the capital structure decisions of MNCs. Moreover, MNCs with better corporate governance have higher short-term debt than DCs, indicating that MNCs do not utilise short-term debt as a disciplining tool to reduce agency costs.

Our results are robust to a battery of checks, including using different proxies to measure leverage, multinationality and corporate governance. We also use more robust estimation techniques to correct for potential endogeneity concerns stemming from the corporate governance and multinationality variables. Overall, we demonstrate that corporate governance explains the difference in capital structure dynamics between US multinational firms and domestic firms.

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Table 1 Summary statistics

The table provides summary statistics for both firm characteristics and corporate governance variables. The sample is drawn from the Compustat North America Database and the Centre for Research in Security Prices (CRSP) over the period 1990–2018. Data for the corporate governance variables are extracted from the Institutional Shareholder Services' (ISS)RiskMetrics (formerly IRRC) database for corporate charter features, and RiskMetrics' directors' database for board size, insiders on board, and CEO duality. The final sample is made up of 17,496 firm-year observations. All the variables are defined in Appendix A.

Panel A: Firm variables	N	Mean	SD	Min	Median	Max
% Foreign sales	17496	0.282	0.254	0.000	0.250	1.000
Market leverage	17496	0.170	0.169	0.000	0.131	0.994
Book leverage	17496	0.208	0.169	0.000	0.196	1.000
% Short-term debt	17496	0.165	0.249	0.000	0.055	1.000
3-year debt maturity	17496	0.232	0.296	0.000	0.118	2.158
% Long-term debt	17496	0.714	0.359	0.000	0.888	1.000
Industry leverage	17496	0.207	0.072	0.078	0.211	0.425
MB ratio	17496	2.128	1.320	0.452	1.733	22.330
Firm size	17496	7.527	1.532	1.009	7.400	12.151
Firm age	17496	27.572	14.611	1.000	26.000	59.000
Dividend payout	17496	0.180	0.226	0.000	0.079	1.000
Free cash flow	17496	0.065	0.070	-0.852	0.063	0.662
Returns on assets	17496	0.060	0.081	-0.529	0.062	0.272
Asset tangibility	17496	0.811	0.191	0.079	0.868	1.000
Asset maturity	17496	9.851	9.427	0.953	7.198	234.480
R&D expenditure	17496	0.031	0.053	0.000	0.007	1.029
Capital expenditure	17496	0.053	0.050	0.000	0.038	0.565

Panel B: Governance variables	N	Mean	SD	Min	Median	Max
G-index	17496	7.710	3.122	0.000	8.000	17.000
E-index	17496	2.803	1.634	0.000	3.000	6.000
Board size	15437	9.107	2.340	1.000	9.000	26.000
Board independence	15437	0.731	0.164	0.000	0.778	1.000
CEO duality	15437	0.604	0.489	0.000	1.000	1.000

Table 2 Univariate results

The table shows the firm characteristics and corporate governance variables for Domestic firms and Multinationals, including the mean difference tests. The final sample is made up of 19,109 firm-year observations for 2,294 firms. All the variables are defined in Appendix A.

Variables	Domestic firms			Multinationals			Mean Difference	
	<i>N</i>	Mean	Median	<i>N</i>	Mean	Median	Difference	<i>t</i> -stat
Market leverage	7755	0.180	0.135	9741	0.162	0.129	0.037***	(25.88)
Book leverage	7755	0.211	0.195	9741	0.205	0.197	0.023***	(19.12)
% Short-term debt	7755	0.147	0.038	9741	0.179	0.070	-0.037***	(-19.80)
3-year debt maturity	7755	0.251	0.128	9741	0.240	0.147	0.968	(0.77)
% Long-term debt	7755	0.719	0.907	9741	0.710	0.873	0.045***	(19.33)
Industry leverage	7755	0.225	0.229	9741	0.192	0.202	0.042***	(86.29)
MB ratio	7755	2.077	1.689	9741	2.169	1.768	-0.180***	(-21.84)
Firm size	7755	7.174	7.013	9741	7.808	7.702	-1.752***	(-133.54)
Firm age	7755	25.137	23.000	9741	29.510	28.000	-3.920***	(-51.89)
Dividend payout	7755	0.181	0.082	9741	0.179	0.076	0.021***	(15.86)
Free cash flow	7755	0.066	0.062	9741	0.064	0.064	0.006***	(9.52)
Return on assets	7755	0.064	0.063	9741	0.057	0.061	0.017***	(24.03)
Asset tangibility	7755	0.829	0.905	9741	0.796	0.839	0.054***	(54.45)
Asset maturity	7755	10.637	7.994	9741	9.225	6.733	0.933***	(11.61)
R&D expenditure	7755	0.017	0.000	9741	0.043	0.023	-0.027***	(-71.00)
Capital expenditure	7755	0.063	0.045	9741	0.045	0.034	0.020***	(45.80)
G-index	7755	7.393	8.000	9741	7.962	8.000	-0.572***	(-12.28)
E-index	7755	2.642	3.000	9741	2.932	3.000	-0.292***	(-11.93)
Board size	6615	8.831	9.000	8822	9.313	9.000	-0.482***	(-12.72)
Board independence	6615	0.694	0.727	8822	0.758	0.800	-0.063***	(-24.21)
CEO duality	6615	0.602	1.000	8822	0.606	1.000	-0.004	(-0.54)

Table 3 Corporate governance, multinationality and market leverage

The table reports the regression results for the leverage ratios of MNCs and DCs. The dependent variable is market leverage. We use two measures of multinationality: % Foreign sales (Columns (1)–(3)) and 20% cut-off MNC (Columns (4)–(6)). The measure of corporate governance is the G-index by [Gompers et al. \(2003\)](#) augmented by [Kieschnick and Moussawi \(2018\)](#). The regressions have interactions of between multinationality and corporate governance - % Foreign sales \times ln(G-index) and MNC20 dummy \times ln(G-index). Firm control variables, year and industry fixed effects are included. The sample consists of listed non-financial and non-utility firms in the US drawn from *Compustat* over the period 1990–2018. All variables used are defined in Appendix A and are winsorized at the lower and upper one percentiles. Numbers in parenthesis are the p-values associated with the null hypothesis that the coefficients equal zero. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
% Foreign sales	-0.028*** (0.000)	-0.031*** (0.000)	0.061*** (0.009)			
MNC 20%				-0.012*** (0.000)	-0.013*** (0.000)	0.040*** (0.000)
ln(G-index)		0.010** (0.019)	0.020*** (0.000)		0.009** (0.019)	0.022*** (0.000)
% Foreign sales \times ln(G-index)			-0.042*** (0.000)			
MNC 20% \times ln(G-index)						-0.025*** (0.000)
ln(Board size)	-0.002 (0.774)	0.005 (0.393)	0.005 (0.390)	-0.001 (0.860)	0.006 (0.353)	0.006 (0.329)
Board independence	0.016* (0.054)	0.016* (0.069)	0.015* (0.088)	0.016** (0.050)	0.016* (0.064)	0.015* (0.091)
CEO duality	-0.007*** (0.002)	-0.007*** (0.001)	-0.007*** (0.001)	-0.006*** (0.002)	-0.007*** (0.001)	-0.007*** (0.001)
Industry leverage	0.493*** (0.000)	0.430*** (0.000)	0.434*** (0.000)	0.490*** (0.000)	0.428*** (0.000)	0.433*** (0.000)
MB ratio	-0.021*** (0.000)	-0.021*** (0.000)	-0.022*** (0.000)	-0.021*** (0.000)	-0.021*** (0.000)	-0.021*** (0.000)
Firm size	0.021*** (0.000)	0.021*** (0.000)	0.021*** (0.000)	0.021*** (0.000)	0.021*** (0.000)	0.021*** (0.000)
Firm age	-0.000 (0.826)	-0.002 (0.405)	-0.002 (0.462)	-0.000 (0.918)	-0.002 (0.414)	-0.002 (0.504)
Dividend payout	-0.039*** (0.000)	-0.040*** (0.000)	-0.040*** (0.000)	-0.040*** (0.000)	-0.040*** (0.000)	-0.040*** (0.000)
Free cash flow	-0.218*** (0.000)	-0.265*** (0.000)	-0.263*** (0.000)	-0.219*** (0.000)	-0.266*** (0.000)	-0.265*** (0.000)
Return on assets	-0.379*** (0.000)	-0.375*** (0.000)	-0.376*** (0.000)	-0.379*** (0.000)	-0.377*** (0.000)	-0.377*** (0.000)
Asset tangibility	-0.106*** (0.000)	-0.101*** (0.000)	-0.102*** (0.000)	-0.108*** (0.000)	-0.104*** (0.000)	-0.104*** (0.000)
Asset maturity	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
R&D expenditure	-0.423*** (0.000)	-0.420*** (0.000)	-0.422*** (0.000)	-0.432*** (0.000)	-0.433*** (0.000)	-0.435*** (0.000)
Capital expenditure	-0.151*** (0.000)	-0.155*** (0.000)	-0.153*** (0.000)	-0.149*** (0.000)	-0.153*** (0.000)	-0.151*** (0.000)
Constant	0.137*** (0.000)	0.128*** (0.001)	0.107*** (0.007)	0.139*** (0.000)	0.131*** (0.001)	0.106*** (0.007)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15078	14107	14107	15078	14107	14107
Adjusted R^2	0.511	0.515	0.515	0.511	0.515	0.515

Table 4 Debt maturity and multinationality

The table reports the regression results for the leverage ratios of MNCs and DCs. The dependent variable is the % Short-term debt (Columns (1)–(4)), 3-year debt maturity (Columns (5)–(8)) for debt maturing within three years, and % Long-term debt (Columns (9)–(12)). We use two measures of multinationality: % Foreign sales and MNC20 dummy. The measure of corporate governance is the G-index by [Gompers et al. \(2003\)](#) augmented by [Kieschnick and Moussawi \(2018\)](#), including the interaction terms between each multinationality measure and corporate governance. Firm control variables, year and industry fixed effects are included. The sample consists of listed non-financial and non-utility firms in the US drawn from *Compustat* over the period 1990–2018. All variables used are defined in Appendix A and are winsorized at the lower and upper one percentiles. Numbers in parenthesis are the p-values associated with the null hypothesis that the coefficients equal zero. ***, **, * and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	% Short-term debt				3-year debt maturity				% Long-term debt			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
% Foreign sales	0.060*** (0.000)	0.176*** (0.001)			-0.032** (0.033)	-0.178*** (0.004)			-0.072*** (0.000)	-0.221*** (0.001)		
MNC 20%			0.016*** (0.004)	0.065*** (0.008)			-0.025*** (0.000)	-0.095*** (0.001)			-0.018** (0.013)	-0.095*** (0.002)
ln(G-index)	-0.022*** (0.010)	-0.009 (0.360)	-0.023*** (0.009)	-0.011 (0.267)	-0.003 (0.770)	-0.020 (0.106)	-0.003 (0.742)	-0.020 (0.105)	0.037*** (0.001)	0.020 (0.127)	0.037*** (0.000)	0.019 (0.141)
% Foreign sales × ln(G-index)		-0.053** (0.020)				0.067** (0.014)				0.069** (0.016)		
MNC 20% × ln(G-index)				-0.023** (0.037)				0.033** (0.013)				0.036*** (0.010)
Constant	0.182*** (0.001)	0.156*** (0.008)	0.172*** (0.003)	0.149** (0.011)	0.276*** (0.000)	0.310*** (0.000)	0.276*** (0.000)	0.310*** (0.000)	0.583*** (0.000)	0.618*** (0.000)	0.596*** (0.000)	0.633*** (0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14107	14107	14107	14107	14107	14107	14107	14107	14107	14107	14107	14107
Adjusted R ²	0.105	0.105	0.104	0.104	0.060	0.060	0.060	0.061	0.308	0.309	0.308	0.308

Table 5 Speed of adjustment

The table reports the two-stage and reduced-form regression results for the speed of adjustment between DCs and MNCs. Panel A reports the 2nd stage regression of the two-stage model where the dependent variable is the change in market leverage. Panel B reports the results of the reduced-form model using the next-period market leverage as the dependent variable. The measure of multinationality is the MNC20 dummy, which is equal to 1 for MNCs and 0 for DCs. The measure of corporate governance is the G-index by [Gompers et al. \(2003\)](#) augmented by [Kieschnick and Moussawi \(2018\)](#), which is partitioned into terciles to denote weak governance (highest tercile), medium governance (median tercile), and strong governance (lowest tercile). Firm control variables, year and industry fixed effects are included. The sample consists of listed non-financial and non-utility firms in the US drawn from *Compustat* over the period 1990–2018. All variables used are defined in Appendix A and are winsorized at the lower and upper one percentiles. Numbers in parenthesis are the p-values associated with the null hypothesis that the coefficients equal zero. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Two-stage model

Variables	DCs			MNCs		
	(1)	(2)	(3)	(4)	(5)	(6)
	Weak	Medium	Strong	Weak	Medium	Strong
Deviation from target (δ)	0.159*** (0.000)	0.188*** (0.000)	0.190*** (0.000)	0.177*** (0.000)	0.206*** (0.000)	0.209*** (0.000)
Constant	-0.023 (0.259)	-0.038*** (0.003)	-0.024** (0.010)	-0.016 (0.489)	-0.037** (0.017)	0.049 (0.258)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1623	1495	1727	2509	2554	1729
Adjusted R^2	0.207	0.171	0.136	0.181	0.185	0.128

Panel B: Reduced-form model

Variables	DCs			MNCs		
	(1)	(2)	(3)	(4)	(5)	(6)
	Weak	Medium	Strong	Weak	Medium	Strong
Lagged leverage ($1-\delta$)	0.848*** (0.000)	0.807*** (0.000)	0.814*** (0.000)	0.823*** (0.000)	0.792*** (0.000)	0.778*** (0.000)
Constant	0.033 (0.451)	0.060 (0.196)	0.043 (0.266)	-0.038 (0.389)	-0.103*** (0.004)	0.129** (0.019)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1623	1495	1727	2509	2554	1729
Adjusted R^2	0.862	0.834	0.799	0.770	0.777	0.838

Table 6 Speed of adjustment: Underlevered and overlevered firms

The table reports the reduced-form regression results for the speed of adjustment for underlevered and overlevered DCs and MNCs. The dependent variable is market leverage. Panel A reports the results of the reduced-form model for underlevered DCs and MNCs whereas Panel B provides the results of the overlevered DCs and MNCs. The measure of multinationality is the MNC20 dummy, which is equal to 1 for MNCs and 0 for DCs. The measure of corporate governance is the G-index by [Gompers et al. \(2003\)](#) augmented by [Kieschnick and Moussawi \(2018\)](#), which is partitioned into terciles to denote weak governance (highest tercile), medium governance (median tercile), and strong governance (lowest tercile). Firm control variables, year and industry fixed effects are included. The sample consists of listed non-financial and non-utility firms in the US drawn from *Compustat* over the period 1990–2018. All variables used are defined in Appendix A and are winsorized at the lower and upper one percentiles. Numbers in parenthesis are the p-values associated with the null hypothesis that the coefficients equal zero. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Adjustment speed for underlevered firms

Variables	DCs			MNCs		
	(1)	(2)	(3)	(4)	(5)	(6)
	Weak	Medium	Strong	Weak	Medium	Strong
Market leverage (1- δ)	0.975*** (0.000)	0.820*** (0.000)	0.871*** (0.000)	0.822*** (0.000)	0.816*** (0.000)	0.759*** (0.000)
Constant	0.110* (0.074)	0.062 (0.359)	0.021 (0.652)	-0.034 (0.512)	-0.086* (0.062)	0.038 (0.320)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	944	895	1050	1455	1502	956
Adjusted R^2	0.758	0.811	0.689	0.688	0.707	0.756

Panel B: Adjustment speed for overlevered firms

Variables	DCs			MNCs		
	(1)	(2)	(3)	(4)	(5)	(6)
	Weak	Medium	Strong	Weak	Medium	Strong
Market leverage (1- δ)	0.690*** (0.000)	0.597*** (0.000)	0.743*** (0.000)	0.675*** (0.000)	0.720*** (0.000)	0.711*** (0.000)
Constant	-0.032 (0.665)	0.147* (0.093)	0.153 (0.102)	0.037 (0.676)	-0.061 (0.342)	0.157* (0.063)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	679	600	677	1054	1052	773
Adjusted R^2	0.882	0.813	0.807	0.797	0.778	0.838

Table 7 Zero-inflated fractional regression

The table reports the two-part zero-inflated fractional regression results for the effects of corporate governance on the leverage ratios of MNCs and DCs. The dependent variable is market leverage. Panel A reports the first-part logit regression for the decision to use debt and Panel B for the second-part GLS regression for how much debt a firm uses given the decision to use debt. We use two measures of multinationality: % Foreign sales (Columns (1)–(3)) and MNC20 dummy (Columns (4)–(6)). The measure of corporate governance is the G-index by [Gompers et al. \(2003\)](#) augmented by [Kieschnick and Moussawi \(2018\)](#), including the interaction terms between each multinationality measure and corporate governance. Firm control variables, year and industry fixed effects are included. The sample consists of listed non-financial and non-utility firms in the US drawn from *Compustat* over the period 1990–2016. All variables used are defined in Appendix A and are winsorized at the lower and upper one percentiles. Numbers in parenthesis are the p-values associated with the null hypothesis that the coefficients equal zero. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: First Part Logit Regression

	(1)	(2)	(3)	(4)	(5)	(6)
% Foreign sales	-0.376** (0.024)	-0.304*	0.514 (0.449)			
MNC 20%				-0.071 (0.399)	-0.047 (0.598)	0.040 (0.909)
ln(G-index)		0.410*** (0.003)	0.506*** (0.001)		0.412*** (0.003)	0.431*** (0.007)
% Foreign sales × ln(G-index)			-0.388 (0.211)			
MNC 20% × ln(G-index)						-0.041 (0.797)
Constant	-1.468** (0.038)	-2.595*** (0.002)	-2.865*** (0.001)	-1.318* (0.061)	-2.460*** (0.003)	-2.517*** (0.003)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11430	10428	10428	11430	10428	10428
p-value	0.000	0.000	0.000	0.000	0.000	0.000
χ^2	3661	3426	3427	3657	3423	3423

Panel B: Second Part GLS Regression

	(1)	(2)	(3)	(4)	(5)	(6)
% Foreign sales	-0.028*** (0.000)	-0.034*** (0.000)	0.078*** (0.002)			
MNC 20%				-0.012*** (0.000)	-0.013*** (0.000)	0.048*** (0.000)
ln(G-index)		0.005 (0.276)	0.018*** (0.000)		0.005 (0.272)	0.020*** (0.000)
% Foreign sales × ln(G-index)			-0.051*** (0.000)			
MNC 20% × ln(G-index)						-0.028*** (0.000)
Constant	0.189*** (0.000)	0.185*** (0.000)	0.159*** (0.000)	0.192*** (0.000)	0.189*** (0.000)	0.159*** (0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13143	12338	12338	13143	12338	12338
p-value	0.000	0.000	0.000	0.000	0.000	0.000
χ^2	13505	12843	12886	13492	12822	12878

Table 8 Instrumental variables (IV) estimations

The table reports results for the instrumental variables two-stage least squares (IV-2SLS) in Columns (1)–(4) and instrumental variables generalised method of moments (IV-GMM) in Columns (5)–(8). The dependent variable is market leverage. We use two measures of multinationality: % Foreign sales (Columns (1), (2), (5)&(6)) and MNC20 dummy (Columns (3), (4), (7)&(8)). The measure of corporate governance is the G-index by [Gompers et al. \(2003\)](#) augmented by [Kieschnick and Moussawi \(2018\)](#), including the interaction terms between each multinationality measure and corporate governance. The instruments for the endogenous variables (multinationality and governance) used in the first stage regressions are the lagged measures of multinationality and state of incorporation, respectively. Firm control variables, year and industry fixed effects are included. The sample consists of listed non-financial and non-utility firms in the US drawn from *Compustat* over the period 1990–2018. All variables used are defined in Appendix A and are winsorized at the lower and upper one percentiles. Numbers in parenthesis are the p-values associated with the null hypothesis that the coefficients equal zero. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	IV-2SLS estimation				IV-GMM estimation			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
% Foreign sales	-0.029*** (0.000)	0.987*** (0.000)			-0.029*** (0.000)	0.978*** (0.000)		
MNC 20%			-0.011*** (0.003)	0.416*** (0.000)			-0.010*** (0.004)	0.412*** (0.000)
ln(G-index)	0.199*** (0.000)	0.359*** (0.000)	0.208*** (0.000)	0.322*** (0.000)	0.197*** (0.000)	0.356*** (0.000)	0.206*** (0.000)	0.319*** (0.000)
% Foreign sales × ln(G-index)		-0.464*** (0.000)				-0.460*** (0.000)		
MNC 20% × ln(G-index)				-0.199*** (0.000)				-0.197*** (0.000)
Constant	-0.205** (0.025)	-0.499*** (0.003)	-0.218** (0.017)	-0.435*** (0.003)	-0.178* (0.059)	-0.472*** (0.006)	-0.191** (0.043)	-0.408*** (0.006)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12263	12263	12263	12263	12263	12263	12263	12263
Adjusted R^2	0.436	0.323	0.426	0.366	0.435	0.324	0.426	0.367
First stage F statistic	46.51	20.80	47.87	27.91				
Anderson-Rubin χ^2	62.48	19.97	45.83	22.06				
Anderson LR statistic	94.18	42.30	96.89	56.69				
χ^2	742441	776973	736417	692087	11750	10656	11665	10977

Table 9 Structural equation model (SEM)

This table reports the structural equation model (SEM) estimates for the direct effect and indirect effect through mediating variables of corporate governance on market leverage. IV, MV, and DV represents the main independent (% Foreign sales and MNC20 dummy), mediating (ln(G-index), and dependent (market leverage) variables, respectively. The measure of corporate governance, the mediating variable, is the augmented G-index (Gompers et al., 2003; Kieschnick and Moussawi, 2018). Firm control variables, year and industry fixed effects are included. The sample consists of listed non-financial and non-utility firms in the US drawn from *Compustat* over the period 1990–2018. All variables used are defined in Appendix A and are winsorized at the lower and upper one percentiles. Numbers in parenthesis are the p-values associated with the null hypothesis that the coefficients equal zero. In determining the significance of indirect effects, we adopt the delta method (Oehlert, 1992; Mensah and Tsang, 2020) to compute the z-statistics. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)
Direct Path:		
<i>P (IV: % Foreign sales, MNC 20%; DV:MLEV)</i>		
% Foreign sales	-0.023*	
	(0.058)	
MNC 20%		-0.013**
		(0.018)
Mediated Path:		
<i>P (IV: % Foreign sales, MNC 20%; MV: ln(G-index))</i>		
% Foreign sales	-0.031***	
	(0.000)	
MNC 20%		-0.013***
		(0.000)
<i>P (MV: ln(G-index); DV:MLEV)</i>		
ln(G-index)	0.010**	0.009**
	(0.016)	(0.016)
<i>P (IV: % Foreign sales, MNC 20%; MV: ln(G-index)) × P (MV: ln(G-index); DV:MLEV)</i>		
	-0.0007**	-0.00013*
	(0.026)	(0.091)
Constant	0.013***	0.013***
	(0.000)	(0.000)
Control variables	Yes	Yes
Year dummies	Yes	Yes
Industry dummies	Yes	Yes
Observations	14107	14107

Table 10 Corporate governance, multinationality, and book leverage

The table reports the regression results for the impact of corporate governance on the leverage ratios of MNCs relative to DCs using an alternative measure of leverage. We use two measures of multinationality: % Foreign sales (Columns (1)–(3)) and 20% cut-off MNC (Columns (4)–(6)). The measure of corporate governance is the G-index by Gompers et al. (2003) augmented by Kieschnick and Moussawi (2018). The regressions have interactions of between multinationality and corporate governance - % Foreign sales \times ln(G-index) and MNC20 dummy \times ln(G-index). Firm control variables, year and industry fixed effects are included. The sample consists of listed non-financial and non-utility firms in the US drawn from *Compustat* over the period 1990–2018. All variables used are defined in Appendix A and are winsorized at the lower and upper one percentiles. Numbers in parenthesis are the p-values associated with the null hypothesis that the coefficients equal zero. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
% Foreign sales	-0.016** (0.012)	-0.020*** (0.003)	0.051* (0.052)			
MNC 20%				-0.004 (0.170)	-0.006** (0.047)	0.021* (0.093)
ln(G-index)		-0.002 (0.574)	0.006 (0.250)		-0.002 (0.580)	0.004 (0.416)
% Foreign sales \times ln(G-index)			-0.033*** (0.005)			
MNC 20% \times ln(G-index)						-0.013** (0.024)
Constant	0.197*** (0.000)	0.173*** (0.000)	0.156*** (0.000)	0.200*** (0.000)	0.176*** (0.000)	0.163*** (0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15078	14107	14107	15078	14107	14107
Adjusted R^2	0.404	0.404	0.404	0.404	0.404	0.404

Table 11 Multinationality, E-index governance proxy and market leverage

The table reports the regression results for the impact of corporate governance on the leverage ratios of MNCs relative to DCs using an alternative governance measure. We use two measures of multinationality: % Foreign sales (Columns (1)&(2)) and 20% cut-off MNC (Columns (3)&(4)). The measure of corporate governance is the E-index by [Bebchuk et al. \(2009\)](#). The regressions include the interaction terms between multinationality and corporate governance - % Foreign sales \times ln(E-index) and MNC20 dummy \times ln(E-index). Firm control variables, year and industry fixed effects are included. The sample consists of listed non-financial and non-utility firms in the US drawn from *Compustat* over the period 1990–2018. All variables used are defined in [Appendix A](#) and are winsorized at the lower and upper one percentiles. Numbers in parenthesis are the p-values associated with the null hypothesis that the coefficients equal zero. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
% Foreign sales	-0.031*** (0.000)	0.024** (0.044)		
MNC 20%			-0.013*** (0.000)	0.014** (0.013)
ln(E-index)	0.003 (0.363)	0.014*** (0.000)	0.003 (0.398)	0.014*** (0.000)
% Foreign sales \times ln(E-index)		-0.042*** (0.000)		
MNC 20% \times ln(E-index)				-0.021*** (0.000)
Constant	0.136*** (0.001)	0.124*** (0.002)	0.140*** (0.000)	0.127*** (0.001)
Control variables	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Observations	14107	14107	14107	14107
Adjusted R^2	0.515	0.516	0.514	0.515

Table 12 Alternative proxies for multinationality

The table reports the regression results for the impact of corporate governance on the leverage ratios of MNCs relative to DCs using alternative proxies for multinationality. The dependent variable is market leverage (Columns (1)–(8)) and book leverage (Columns (9)–(16)). Our alternative measures of multinationality are MNC50 dummy if % Foreign sales is at least 50%, % FSubs is the ratio of the number of foreign subsidiaries to the total number of subsidiaries, and No. FSubs ≥ 1 dummy is a dummy variable that is equal to 1 if the number of foreign subsidiaries is at least 1. The measure of corporate governance is the G-index by [Compers et al. \(2003\)](#) augmented by [Kieschnick and Moussawi \(2018\)](#). The regressions include the interaction terms between each measure of multinationality and corporate governance. Firm control variables, year and industry fixed effects are included. The sample consists of listed non-financial and non-utility firms in the US drawn from *Compustat* over the period 1990–2018. All variables used are defined in Appendix A and are winsorized at the lower and upper one percentiles. Numbers in parenthesis are the p-values associated with the null hypothesis that the coefficients equal zero. ***, **, * and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	Market leverage								Book leverage							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
MNC 10%	-0.010*** (0.001)	0.036*** (0.002)							0.000 (0.966)	0.024* (0.073)						
MNC 50%			-0.010*** (0.001)	0.043*** (0.001)							-0.009*** (0.005)	0.044*** (0.003)				
% FSubs					-0.006 (0.202)	0.115*** (0.000)							0.002 (0.792)	0.076*** (0.000)		
No. FSubs dummy							-0.015*** (0.000)	0.070*** (0.000)							-0.010** (0.027)	0.055*** (0.004)
ln(G-index)	0.010** (0.016)	0.023*** (0.000)	0.010** (0.018)	0.014*** (0.001)	0.006 (0.164)	0.035*** (0.000)	0.007 (0.127)	0.040*** (0.000)	-0.002 (0.612)	0.005 (0.409)	-0.002 (0.572)	0.002 (0.666)	-0.000 (0.955)	0.017*** (0.006)	-0.000 (0.969)	0.026*** (0.004)
MNC 10% \times ln(G-index)		-0.022*** (0.000)								-0.011* (0.064)						
MNC 50% \times ln(G-index)				-0.024*** (0.000)								-0.024*** (0.000)				
% FSubs \times ln(G-index)						-0.058*** (0.000)								-0.035*** (0.000)		
No. FSubs dummy \times ln(G-index)								-0.041*** (0.000)								-0.032*** (0.001)
Constant	0.136*** (0.001)	0.108*** (0.006)	0.128*** (0.001)	0.120*** (0.002)	0.226*** (0.000)	0.162*** (0.003)	0.233*** (0.000)	0.162*** (0.003)	0.178*** (0.000)	0.164*** (0.000)	0.171*** (0.000)	0.163*** (0.000)	0.214*** (0.000)	0.175*** (0.000)	0.220*** (0.000)	0.165*** (0.000)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14107	14107	14107	14107	9631	9631	9631	9631	14107	14107	14107	14107	9631	9631	9631	9631
Adjusted R ²	0.514	0.515	0.514	0.515	0.529	0.532	0.530	0.532	0.404	0.404	0.404	0.404	0.417	0.418	0.418	0.418

Appendix A : Variable definitions

Our variables are constructed using CRSP/Compustat, Execucomp, RiskMetrics Governance, RiskMetrics Directors databases.

Variable	Definition
Proxies for multinationality	
% Foreign sales	Foreign sales divided by consolidated sales.
MNC20 dummy	A dummy variable that equals 1 if % Foreign sales is at least 20% and 0 otherwise.
MNC10 dummy	A dummy variable that equals 1 if % Foreign sales is at least 10% and 0 otherwise.
MNC50 dummy	A dummy variable that equals 1 if % Foreign sales is at least 50% and 0 otherwise.
% FSubs	Ratio of the number of foreign subsidiaries to the total number of subsidiaries.
No. FSubs \geq 1 dummy	A dummy variable that equals 1 if the number of foreign subsidiaries is at least 1 and 0 otherwise.
Firm characteristics	
Market leverage	$[\text{Long-term debt} + \text{Short-term debt}] / [\text{Long-term debt} + \text{Short-term debt} + \text{Market value of equity}]$.
Book leverage	$[\text{Long-term debt} + \text{Short-term debt}] / [\text{Long-term debt} + \text{Short-term debt} + \text{Book value of equity}]$
% Long-term debt	$[\text{Long-term debt}] / [\text{Long-term debt} + \text{Short-term debt}]$
% Short-term debt	$[\text{Short-term debt}] / [\text{Long-term debt} + \text{Short-term debt}]$
3-year debt maturity	The proportion of short-maturity debt (debt that matures within three years) in total debt. Debt maturity: $[\text{Debt due in Year 1} + \text{Debt due in Year 2} + \text{Debt due in Year 3}] / [\text{Short-term debt} + \text{Long-term debt}]$.
Industry leverage	Median of market leverage for different industries by year where industry is defined using the Fama and French (1997) 48 industry classifications.
MB ratio	Market value of assets to book value of assets.
Firm size	Logarithm of total assets.
Firm age	Number of years on Compustat.
Dividend payout	Cash dividends to net income.
Free cash flow	Gross operating income minus depreciation, tax payments and interest expenses divided by total assets.
Return on assets	Ratio of operating income before depreciation to total assets.
Asset tangibility	Ratio of net property, plant and equipment to total assets.
Asset maturity	Current assets divided by cost of goods sold plus property, plant and equipment divided by depreciation.
R&D expenditure	Research and development to total assets.
Capital expenditure	Capital expenditure to total assets.
Governance variables	
G-index	Sum of the number of the 18 of the 24 anti-takeover provisions, restricting shareholder rights introduced by Gompers et al. (2003) . The 18 anti-takeover provisions are similar to the Gindex created by Kieschnick and Moussawi (2018) and as follows: business combination (freezeout), fair price, control share acquisition, recapture of profits, control share cashout, and director duties (stakeholder clause), blank check preferred stock, classified or staggered board, limits to charter amendments, limits to shareholder by-laws amendments, limits to call special meetings, limits for written consent, supermajority requirements to approve mergers, poison pill, golden parachutes, unequal voting, cumulative voting, and confidential voting.
E-index	Sum of the number of the six anti-takeover provisions, restricting shareholder rights introduced by Bebchuk et al. (2009) . The 6 anti-takeover provisions are as follows: staggered boards, limits to amend bylaws, limits to amend charter, supermajority to approve a merger, golden parachute, and poison pill.
Board size	The number of directors on the board derived from RiskMetric's directors database.
Board independence	Proportion of board accounted for by managers or their family members, derived from RiskMetric's directors database.
CEO duality	A dummy variable equals 1 if the CEO is also chairman of the board.

Appendix B Correlation matrix

The table provides correlation matrix for both firm characteristics and corporate governance variables. The sample is drawn from the Compustat North America Database and the Centre for Research in Security Prices (CRSP) over the period 1990–2018. Data for the corporate governance variables are extracted from the Institutional Shareholder Services' (ISS) RiskMetrics (formerly IRRC) database for corporate charter features, and RiskMetrics' directors' database for board size, insiders on board, and CEO duality. The final sample is made up of 19,109 firm-year observations. All the variables are defined in Appendix A. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)Market leverage	1.00																	
(2)Book leverage	0.80***	1.00																
(3)% Long-term debt	0.35***	0.44***	1.00															
(4)% Short-term debt	-0.02***	-0.08***	-0.55***	1.00														
(5)3-year debt maturity	-0.00	-0.01*	0.02***	0.02***	1.00													
(6)Industry leverage	0.37***	0.21***	0.18***	-0.03***	-0.01***	1.00												
(7)MB ratio	-0.43***	-0.21***	-0.18***	0.01**	-0.00	-0.32***	1.00											
(8)Firm size	0.08***	0.16***	0.28***	-0.18***	-0.01***	-0.07***	-0.07***	1.00										
(9)Firm age	0.00	0.01***	0.13***	-0.10***	0.00	-0.07***	-0.07***	0.43***	1.00									
(10)Dividend payout	-0.03***	-0.04***	0.09***	-0.06***	-0.02***	0.18***	-0.08***	0.25***	0.23***	1.00								
(11)Free cash flow	-0.20***	-0.15***	0.05***	-0.08***	-0.01**	0.09***	0.12***	0.12***	0.06***	0.17***	1.00							
(12)Asset tangibility	-0.01**	-0.13***	-0.13***	0.10***	-0.01***	0.19***	-0.03***	-0.30***	-0.15***	0.06***	0.02***	1.00						
(13)Asset maturity	0.08***	0.07***	0.08***	-0.08***	-0.00	0.09***	-0.05***	0.05***	0.06***	0.09***	-0.06***	0.21***	1.00					
(14)Return on assets	-0.23***	-0.19***	0.03***	-0.08***	-0.01***	0.11***	0.12***	0.06***	0.03***	0.18***	0.83***	0.09***	-0.03***	1.00				
(15)R&D expenditure	-0.25***	-0.22***	-0.22***	0.06***	0.01**	-0.40***	0.27***	-0.09***	-0.06***	-0.15***	-0.30***	0.01***	-0.08***	-0.29***	1.00			
(16)Capital expenditure	0.02***	0.10***	0.14***	-0.07***	0.00	0.14***	0.04***	-0.03***	-0.14***	-0.01**	0.08***	0.23***	0.22***	0.10***	-0.11***	1.00		
(17)G-index	0.03***	0.06***	0.10***	-0.11***	0.01*	-0.02**	-0.04**	0.18***	0.25***	0.07***	0.02**	-0.24***	-0.02**	-0.02**	-0.04***	-0.14***	1.00	
(18)E-index	0.03***	0.06***	0.10***	-0.11***	0.02*	-0.02***	-0.04**	0.13***	0.19***	0.04***	-0.01	-0.23***	-0.01	-0.03***	-0.01	-0.12***	0.86***	1.00