Debt Heterogeneity, Agency Costs and Business Risk of Multinational Corporations

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Abstract
Internationalization enables multinational corporations (MNCs) to diversify their source and type of debt as well as earnings, although doing so incurs agency costs of debt and business risk. To mitigate these costs, existing studies find that MNCs typically have lower levels of long-term debt than domestic corporations (DCs). One key limitation of these studies is their failure to recognize the heterogeneity of debt, specifically the equity options embedded in the debt issued by MNCs. We show that in the presence of agency costs of debt and business risk, MNCs are able to mitigate the negative effects on long-term debt by utilizing convertible debt in their debt structure, as compared to DCs. Therefore, MNCs are able to sustain higher levels of long-term debt to make the most from international diversification. Relatively, the significance of business risk is found to outweigh the significance of agency costs as MNCs further increase their degree of internationalization. Evidence also shows that the issuers of convertible debt are not dominated by smaller and riskier growth firms, but is linked to internationalization.

Keywords: agency costs, business risk, convertible debt, internationalization,
JEL Classification: F23, G3, G15, G32

1. Introduction

In the presence of agency costs of debt and business risk, multinational corporations (hereafter MNCs) are found to decrease their long-term debt by decreasing non-convertible debt, but the net decrease in the long-term debt is mitigated by convertible debt. Conversely, domestic corporations (hereafter DCs) are found to decrease convertible and non-convertible debt to mitigate agency costs of debt. Business risk is found to be insignificant in affecting DCs' choice of long-term debt. Therefore we claim; MNCs are able to mitigate the agency costs and business risk from internationalization by issuing convertible debt.

Our findings also imply the importance of recognizing the heterogeneous feature of long-term debt. Existing studies that centre on the leverage between MNCs and DCs share a similarity, that is long-term debt is assumed to be homogeneous. In fact, additional insight can be attained when debt heterogeneity is recognized because different types of debt have difference cash flow claims, control provisions and sensitivity to information (Rauh and Sufi, 2010).

In this study, we recognize the heterogeneous feature of long-term debt by convertible and non-convertible debt to provide an alternative justification that enables MNCs to sustain higher levels of long-term debt in the presence of agency costs of debt and business risk. This is because MNCs are found to use more short-term debt than DCs in the effort of mitigating agency costs of debt (Doukas and Pantzalis, 2003; Singh and Nejadmalayeri, 2004). But there are disadvantages of short-term debt. Firms are exposed to higher refinancing and interest rate risks due to the frequent rollover of short-term debt. Furthermore, it is advisable for MNCs that are likely to have higher

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investment opportunities than DCs to take advantage of the heterogeneous feature of long-term debt in financing their capital expenditure to maximise the benefits of internationalization.

We consider only the choice between convertible and non-convertible debt because the equity option, embedded in convertible debt is the key feature that differentiates these two types of debt. The equity option allows the convertible debtholder to forgo the fixed-income component to convert into the underlying equity to participate in any increase of the shareholders value. The conversion into equity is able to restore value maximizing incentives, thus mitigate the distortionary incentives created by risky debt. Therefore, risk-shifting hypothesis claims that convertible debt is designed to mitigate the debtholder-shareholder agency costs (Green, 1984). On the other hand, convertible debt is also claimed to be the preferred choice over straight debt and equity to mitigate financial distress costs (Stein, 1992).

We identify three important contributions. First, we highlight the importance of recognizing the heterogeneous characteristic of long-term debt to mitigate the negative impact of agency costs of debt and business risk on the MNCs long-term debt level. This allows us to show that MNCs can utilize the embedded equity options of convertible debt to moderate the net negative effect on long-term debt. Second, we construct our samples into MNCs by different degree of internationalization and DCs. By doing so, we are able to provide evidence that debt heterogeneity, agency costs and business risk are linked to the degree of internationalization. Third, this study contributes to the convertible debt literature related to the motivation for the issuance of this security from the international perspective.

To provide robust evidence, we construct the MNCs by three different minimum level of internationalization that is 10% (MNC10), 25% (MNC25) and 50% (MNC50). Foreign sales ratio is the commonly used measure for degree of internationalization. But since the reported sales figures may include sales by foreign subsidiaries and export by parent companies, we also filter the MNCs by foreign tax ratio. Hence, exports by parent companies can be excluded since exports are considered as locally taxed revenues. This is to avoid any potential bias created due to the identification process. For comparison, a sample of DCs is defined. A DC is defined as a firm that reports no foreign sales and foreign tax.

In an overall view, agency costs of debt and business risk are positively related to MNCs decision to use convertible debt as compared to DCs. But relatively, the significance of business risk is found to outweigh the significance of agency costs as MNCs further increase their degree of internationalization to 50% or more. As for DCs, business risk is found to be insignificant. Instead, DCs is reported to decrease convertible and non-convertible debt in the presence of agency costs. Our findings remain consistent even controlling for the key firm characteristics associated with intangibility such as profitability, tangibility and growth opportunity (Park et al., 2013), as well as market conditions such as the recent global financial crisis and the subsequent quantitative easing policy.

We also provide evidence to justify that the issuers of convertible debt is not dominated by smaller and riskier growth firms, represented by NASDAQ-listed MNCs and DCs. NASDAQ and non-NASDAQ-listed MNCs are found to use convertible debt to mitigate the agency costs of debt and business risk, respectively, with the increasing degree of internationalization. On the contrary, both agency costs and business risk are found to have insignificant positive relationship with convertible debt for the NASDAQ and non-NASDAQ-listed DCs. Accordingly, we emphasize that the mitigation of agency costs and business risk is also linked to internationalization.

Moreover, we rank our samples of MNCs and DCs by their total assets to classify them into Bottom30 and Top30 that justifies, issuers of convertible debt is not dominated by smaller size firm.

MNCs in Bottom30 and Top30 are found to mitigate the negative effect of business risk by issuing convertible debt, but this finding is insignificant for the Bottom30 and Top30 DCs. Additionally, larger size MNCs in Bottom30 are found to use convertible debt instead of non-convertible debt, but it is the opposite for DCs. Though, agency costs are found to have insignificant effect on the Bottom30 and Top30 MNCs' convertible debt level, it has significantly negative effect on the Top30 DCs' convertible debt level. Taken together, these findings also suggest that the decision to use convertible debt in mitigating either the agency costs or business risk is related to internationalization.

This study is structured as follows: next, a review of the literature is undertaken. Then in Section 3 the data and methods used in this study are established; Section 4 provides the empirical results and discussion, while the final Section 5 presents the concluding remarks.

2. Literature Review

2.1 Research Background

Internationalization should enable MNCs to sustain higher leverage than DCs because international diversification of earnings can reduce overall bankruptcy risk in turn leading to a lower cost of debt financing (Hughes et al., 1975; Rugman, 1976). Nonetheless, empirical results have provided inconsistent evidence. US MNCs are found to utilize lower levels of long-term debt in their capital structure than DCs after controlling for firm size and industry effects (Burgman, 1996; Chen et al., 1997; Fatemi, 1988; Lee and Kwok, 1988).On the other hand, a recent study by Park, et al. (2013) reports insignificant difference between the leverage levels of US MNCs and DCs when the analyses control for the key firm characteristics associated with intangibility, such as high profitability, low asset tangibility, and high growth potential. But note that Park, et al (2013) construct their samples of MNCs and DCs with a higher cut-off level of $1 billion in book assets than the aforementioned studies.

Evidence from the non-US markets show mixed results. For example, the Japanese MNCs are found to be less levered than the DCs though multinationality is found to be a significant aspect of leverage (Akhtar and Oliver, 2009). Alternately, Singh and Nejadmalayeri (2004) find a positive relationship between the degree of internationalization and leverage for the French MNCs, in comparison to DCs. The same positive relationship is observed by Mittoo and Zhang (2008) for the Canadian MNCs but the finding is mainly from their US operations. As for the expansion to non-US markets, there is little impact on the leverage. As for the Australian MNCs, insignificant difference in the levels of leverage is reported between the MNCs and DCs (Akhtar, 2005).

Though several justifications have been put forward to explain the less leveraged US MNCs than DCs, the agency costs of debt have been one of the most cited theories in explaining the lower debt ratios of MNCs (Burgman, 1996; Chen et al., 1997; Doukas and Pantzalis, 2003; Lee and Kwok, 1988). The benefits from international diversification are claimed to be offset by the systematic differences in the agency costs of debt between MNCs and DCs (Burgman, 1996). The adverse effect of agency costs of debt on the MNCs' leverage levels increase with the increasing degree of internationalization (Doukas and Pantzalis, 2003).Therefore, MNCs tend to use lower levels of long-term debt to deal with the higher agency costs (Doukas and Pantzalis, 2003; Fatemi, 1988).

Literature suggests that MNCs have high growth potential because these firms have greater access to larger markets than DCs (Lee and Kwok, 1988; Mittoo and Zhang, 2008). But, firms with high growth opportunities lead to suboptimal investment decisions, explained by the

underinvestment hypothesis. Shareholders would reject value enhancing investment opportunities if the benefits of accepting these projects accrue mostly to debtholders instead of shareholders (Myers, 1984). In order to mitigate these agency costs, MNCs maintain lower levels of long-term debt than DCs.

In addition, business risk is another important determinant of leverage. MNCs may expose to greater uncertainties as the extant of internationalization increases. According to the trade-off theory, higher business risk translates into higher expected financial distress costs. Therefore, to mitigate the increased bankruptcy risk, MNCs decrease their long-term debt financing (Burgman, 1996; Chen et al., 1997) to maintain their debt capacity (Park et al., 2013). Mittoo and Zhang (2008) find significantly negative effect of business risk on the leverage of US MNCs. But the negative effect is insignificant for the Canadian MNCs, which is consistent with Kwok and Reeb's (2000) upstream-downstream hypothesis that examines the different effects of MNCs' business risk based on the relative risks in the home and target countries.

2.2 Hypotheses Development

Risk-shifting hypothesis argues that firms substitute convertible debt for straight debt to mitigate the potential debtholders-shareholders conflicts of interest (Green, 1984). This argument is developed from the asset substitution problem of Jensen and Meckling (1976). Shareholders are claimed to have incentive to shift risk to debtholders by overinvesting in high-risk investment projects, thus transferring debtholders' wealth to shareholders through falling debt prices and higher credit spreads. In turn, risk-shifting increases the probability of financial distress that translate into a large loss in value from underinvestment, specifically for high-growth firms (Jen et al., 1997).Though issuance of equity can alleviate the agency costs related to risky straight debt financing, it may incur other equity-related costs, such as the forgone interest tax shield or the excessive managerial costs that may outweigh the benefits of reducing the risk-shifting problem (Lewis et al., 1999).

The potential debtholders-shareholders conflicts of interest can be resolved by utilising the embedded equity option of convertible debt. These options enable the debtholders to convert their claims into equity to participate in any increase of the shareholders' value, thus reducing the expropriation of wealth. All else equal, the greater the opportunities to expropriate the debtholders' value through high-risk investment projects, the larger the post-conversion equity ownership that should be allocated to the convertible debt holders (Lewis et al., 1999). For these reasons, MNCs that face agency costs of debt are expected to use more convertible debt, but less non-convertible debt to mitigate the agency conflicts. Consequently, MNCs can sustain higher levels of long-term debt to make the most from international diversification.

Hypothesis 1: US MNCs can utilize convertible debt to mitigate the agency costs of debt.

Alternately, firms with high financial distress costs are claimed to prefer equity than debt (Stein, 1992). But if these firms also face significant adverse selection costs due to informational asymmetries between firms' managers and investors, equity becomes less attractive because the value is sensitive to the subsequent disclosure of the firms' private information. Likewise, in the presence of high financial distress costs, the less informative sensitive straight debt becomes less attractive to mitigate the adverse selection costs because the financial distress costs could potentially outweigh the adverse selection costs.

Therefore the backdoor equity financing hypothesis suggests that under high adverse selection costs, firms with high expected financial distress costs tend to issue convertible debt as a substitute for equity (Stein, 1992), which also explain the reason growth firms find it more

attractive to issue convertible debt. Moreover, growth firm managers may be reluctant to issue equity if the prevailing stock price does not adequately reflect the firm's growth opportunities since it may dilute existing shareholders' claims. The intuition of backdoor equity financing hypothesis is based on the trade-off between the financial distress costs of straight debt and the adverse selection costs of equity. Hence under these circumstances, firms are expected to issue convertible debt.

Additionally, the upstream-downstream hypothesis (Kwok and Reeb, 2000) argues that as MNCs extend their business operations from a more stable market, such as US, to less stable markets or non US markets (going downstream), there will be an increase in the MNCs business risk because of greater uncertainties and information asymmetries. Evidence shows that MNCs maintain lower leverage to mitigate the higher business risk. But, the weaker country specific corporate governance qualities of the less stable markets are found to encourage the issuance of convertible debt (Dutordoir et al., 2014). Therefore with the same intuition, these MNCs are expected to utilize more convertible debt, but less non-convertible debt to mitigate business risk from internationalization to sustain higher levels of long-term debt.

Hypothesis 2: US MNCs can utilize convertible debt to mitigate the business risk.

3. Data and Methodology

3.1 Sample Selection

Statement of Financial Accounting Standard (SFAS) No. 14 requires an issuer to report its revenues, operating profit (loss), and identifiable assets if a segment's revenues, operating profit or identifiable assets are 10% or more of related consolidated amounts. Equally, a firm is defined as MNC when the degree of internationalization is greater than or equals to 10%, which is also consistent with the existing studies (Akhtar, 2005; Burgman, 1996; Lee and Kwok, 1988; Mittoo and Zhang, 2008). In this study, we use the commonly used foreign sales ratio as the proxy for the degree of internationalization, measured as the ratio of foreign sales to total sales. Since the reported sales figures may include both sales by foreign subsidiaries and exports by the parent company (Burgman, 1996; Lee and Kwok, 1988), the firms are also filtered by foreign tax ratio so that exports by parent companies that are considered as locally taxed revenues can be excluded to avoid from potential bias.

Three samples of MNCs; MNC10, MNC25 and MNC50 are identified from the Compustat database for the fiscal year from 2002 to 2011, in which both the foreign sales ratio and the foreign tax ratio are greater than or equal to 10%, 25% and 50%, respectively. MNC10 consists of 726 MNCs with 3,449 firm-year observations; MNC25 consists of 563 MNCs with 2,425 firm-year observations, whereas MNC50 consists of 275 MNCs with 949 firm-year observations. For comparison, a sample of DCs is also defined, consisting of 684 firms with 3,329 firm-year observations. A DC is defined as a firm that reports no foreign sales and foreign tax.

These samples are obtained after excluding the regulated firms (SIC coded 4000-4999) and financial firms (SIC coded 6000-6999), all equity firms, firms with negative growth opportunities, firms that have less than four years of observations for the business risk measure, and firms with total assets below $10 million to control for potential bias in size differences between MNCs and DCs (Chen et al., 1997; Lee and Kwok, 1988). Any firm-year observations with missing financial information for the observed variables are also excluded. Firms that have observations in both the MNC and DC samples are also excluded, to control for DCs that later expand their operations internationally, within our observation period. Also, the samples are limited to the US incorporated

firms that are publicly traded on major exchanges such as the New York Stock Exchange (NYSE) and NASDAQ.

3.2 Variables Selection

The data for the identified variables are also from Compustat. Firm's leverage is measured by the long-term debt ratio scaled by total capital, the sum of long-term debt and market value of shareholders' equity (Akhtar and Oliver, 2009; Burgman, 1996; Lee and Kwok, 1988; Singh and Nejadmalayeri, 2004). Then, we identify long-term debt by convertible and non-convertible debt. Both are also scaled by total capital.

Agency cost of debt is measured by market-to-book ratio (Chen et al., 1997; Lewis et al., 1999; Park et al., 2013; Rauh and Sufi, 2010). We take the natural log of the market-to-book ratio to smooth the distribution of the ratio. Higher market-to-book ratio signifies higher agency costs of underinvestment and risk-shifting. Though internationalization enables MNCs to better exploit potential growth opportunities than DCs, it also leads to higher agency cost, thus lower levels of long-term debt than DCs (Akhtar, 2005; Akhtar and Oliver, 2009; Burgman, 1996; Chen et al., 1997; Fatemi, 1988; Lee and Kwok, 1988). Supported by the risk-shifting hypothesis, MNCs with higher agency costs are expected to have less long-term debt and non-convertible debt but more convertible debt.

Business risk is measured by the standard deviation of earnings before interest and taxes (EBIT) over sales of four years. Trade-off theory claims that as risk increases, firms' debt capacity decreases because of the increasing probability of financial distress. Evidence shows that issuers of convertible debt tend to be riskier than issuers of non-convertible debt or equivalent (Lewis et al., 1999). Moreover, risk is positively related to the use of convertible debt (Chang et al., 2004; Jen et al., 1997). Issuers with higher expected financial distress costs issue convertible debt to reduce the financial risk (Jen et al., 1997). Therefore, riskier firms, in our study MNCs with higher degree of internationalization, are expected to prefer convertible debt over non-convertible debt, as compared to DCs.

Degree of internationalization, measured by the foreign sales ratio is also considered. It is meant to control for the effect of the extent of foreign involvement on long-term debt as well as the choice between convertible and non-convertible debt in each sample of MNCs. Higher degree of internationalization denotes greater extent of foreign involvement. MNCs with higher degree of internationalization are expected to use less long-term debt and non-convertible debt because of the increasing agency costs (Doukas and Pantzalis, 2003) and business risk (Burgman, 1996; Chen et al., 1997). Conversely, MNCs are expected to use more convertible debt, supported by the risk-shifting hypothesis and backdoor equity hypothesis that convertible debt is designed to mitigate the agency costs between financial claimants (Green, 1984) and financial distress costs (Stein, 1992), respectively.

Control variables are also included to account for trade-off and pecking order theories. Firm size is measured by the natural log of total assets that is included to control for any effects related to firm size. Firm size is claimed to be positively related to leverage (Lewis et al., 1999; Mittoo and Zhang, 2008; Rajan and Zingales, 1995). Firm size also measures the magnitude of financial distress costs. Larger size firms are expected to have lower financial distress costs, thus allowing the firm to tolerate a higher level of leverage. Moreover, firm size is considered as the measure of degree of information asymmetry (Lewis et al., 1999). Large firms are more likely to issue straight debt because these firms face less information asymmetry as large firms tends to be more mature and established. Conversely, convertible debt issuers tend to be smaller and riskier than straight debt issuers that are potentially vulnerable to adverse selection problems (Lewis et al., 1999).

Tangibility represents the collateral available for debt financing. According to the trade-off theory, firms with more tangible assets are expected to have higher leverage due to lower default costs and less debt-related agency problems (Mittoo and Zhang, 2008; Rauh and Sufi, 2010). In this study, tangibility is measured by the ratio of net plant and equipment to total assets (Jen et al., 1997). Firms with higher tangible assets are claimed to have more collateral for debt issuance and a higher liquidation value in the event of bankruptcy (Deesomsak et al., 2004). Therefore, there is higher incentive for the issuance of straight debt equivalents. Mayers (1998) shows that convertible debt issuers tend to have lower than the industry median ratio of tangible to total assets. Also Jen et al. (1997) add that the value of growth firms are largely through investment opportunities rather than tangible assets, thus these firms are more likely to issue convertible debt. Accordingly, MNCs with higher tangible assets are predicted to be positively related to long-term debt and non-convertible debt but negatively related to convertible debt.

Profitability, measured by the return on assets is meant to control for the pecking order hypothesis of Myers (1984), which argues that firms would follow a financing hierarchy, with retained earnings being the most preferred choice for financing, followed by debt, equity, and convertible debt in between. Profitable firms are found to use less debt (Mittoo and Zhang, 2008; Rauh and Sufi, 2010). Similarly in our study, an inverse relationship is expected between profitability and level of leverage, but when convertible debt is compared with non-convertible debt, profitable MNCs are expected to utilise higher levels of non-convertible as compared to convertible debt because of informational asymmetry between managers and investors (Deesomsak et al., 2004).

Moreover, Dummy Both is added to control for firms that have both convertible debt and non-convertible debt in their debt structure. It is a dummy equal to one if the issuer's debt structure consists of both types of debt and zero otherwise. Dummy Crisis and Quantitative Easing are included to control for the effects of market environment. Dummy Crisis equals to one for observations from year 2007 to 2009 that control for the effects of the 2007-2009 Global Financial Crisis. Alternately, quantitative easing is introduced when the interest rates are close to zero, in which central banks buys financial securities to create new money in order to stimulate the economy. Quantitative Easing I spans from November 25, 2008 to March 2010, whereas Quantitative Easing II spans from November 2010 to June 2011. Since this study consists of annual observation, the Quantitative Easing variable can only be approximated, in which it equals to one for observations from 2009 to 2011 and zero otherwise.

3.3 Methodology

Since the dataset have dimensions of both cross-sectional and time-series, we use panel data regression because it provides more robust analysis (Akhtar, 2005). Moreover, there could be potential bias due to correlation of the error terms across years if we use the cross-sectional regression to analyze the panel data. To decide between the fixed and random effects, the Hausman test is performed. If the error terms are correlated with the explanatory variables, then fixed effects are preferred over random effects.

Equation 1: Fixed effects panel regression

$$\frac{Debt\ type_{i,t}}{Total\ capital_{i,t}} = \beta_0 + \beta_1 Agency\ cost_{i,t} + \beta_2 Business\ risk_{i,t} +$$

$$\beta_3 Degree\ of\ internationlization_{i,t} + \beta_4 Size_{i,t} + \beta_5 Tangibility_{i,t} + \beta_6 Profitability_{i,t}$$

$$+ \beta_7 Dummy\ Both_{i,t} + \beta_8 Dummy\ crisis_{i,t} + \beta_9 Quantitative\ easing_{i,t} + \gamma_i + \varepsilon_{i,t}$$

Equation 2: Random effects panel regression

$$\frac{Debt\ type_{i,t}}{Total\ capital_{i,t}} = \beta_0 + \beta_1 Agency\ cost\ _{i,t} + \beta_2 Business\ risk_{i,t} +$$

$$\beta_3 Degree\ of\ internationalization_{i,t} + \beta_4 Size_{i,t} + \beta_5 Tangibility_{i,t} + \beta_6 Profitability_{i,t}$$

$$+ \beta_7 Dummy\ Both_{i,t} + \beta_8 Dummy\ crisis_{i,t} + \beta_9 Quantitative\ easing_{i,t} + \gamma_{i,t} + \varepsilon_{i,t}$$

4. Empirical Results and Discussion

4.1 Sample Description

Table 1 reports the summary statistics (Panel A) and the mean differences of the identified variables between MNCs and DCs (Panel B). MNCs are found to use less long-term debt as compared to DCs, consistent with previous studies (Akhtar and Oliver, 2009; Burgman, 1996; Chen et al., 1997; Doukas and Pantzalis, 2003; Fatemi, 1988; Lee and Kwok, 1988). On average, MNCs and DCs maintain about 17.3% and 20.4% of long-term debt, respectively in their financial structure. Interestingly, when we examine their debt structure, MNCs are found to have increasing levels of convertible debt, but decreasing level of non-convertible debt with the increasing degree of internationalization. On the contrary, DCs use less convertible debt, but more non-convertible debt in their debt structure.

Table 1
Summary Statistics and Mean Differences by Different Degree of Internationalization

Panel A: Summary statistics

Variable	MNC10		MNC25		MNC50		DC	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Long-term debt ratio	0.173	0.136	0.170	0.134	0.174	0.144	0.204	0.169
Convertible debt ratio	0.025	0.065	0.026	0.067	0.031	0.078	0.019	0.057
Non-convertible debt ratio	0.148	0.134	0.144	0.131	0.143	0.140	0.185	0.170
Agency cost	0.989	0.667	0.996	0.659	0.998	0.713	0.942	0.752
Business risk	0.057	0.926	0.066	1.103	0.114	1.759	0.483	4.103
Degree of internationalization	0.461	0.197	0.530	0.167	0.671	0.115	0.000	0.000
Size	7.687	1.650	7.751	1.677	7.627	1.672	6.282	1.834
Tangibility	0.221	0.168	0.216	0.164	0.236	0.168	0.359	0.267
Profitability	0.052	0.083	0.049	0.077	0.042	0.086	0.016	0.186
Dummy Both	0.174	0.379	0.179	0.383	0.183	0.387	0.117	0.322
Dummy crisis	0.302	0.459	0.306	0.461	0.314	0.464	0.289	0.453
Quantitative easing	0.353	0.478	0.368	0.482	0.407	0.491	0.318	0.466
Firm-year observations	3449		2425		949		3329	

Panel B: Mean difference

Variables	MNC10 - DC		MNC25 – DC		MNC50 – DC	
	Mean Difference	t-value	Mean Difference	t-value	Mean Difference	t-value
Long-term debt ratio	-0.031***	-8.434	-0.034***	-8.472	-0.030***	-5.420
Convertible debt ratio	0.006***	4.134	0.007***	4.356	0.012***	4.579
Non-convertible debt ratio	-0.038***	-10.072	-0.041***	-10.365	-0.042***	-7.819
Agency cost	0.046***	2.681	0.054***	2.888	0.557**	2.096
Business risk	-0.426***	-5.851	-0.416***	-5.587	-0.368***	-4.039
Size	1.405***	33.105	1.468***	31.525	1.344***	21.376
Tangibility	-0.138***	-25.384	-0.143***	-25.055	-0.123***	-17.154
Profitability	0.036***	10.353	0.033***	9.219	0.026***	6.127
Dummy Both	0.057***	6.654	0.062***	6.422	0.066***	4.792
Dummy crisis	0.013	1.133	0.017	1.358	0.025	1.473
Quantitative easing	0.035***	3.055	0.050***	3.917	0.089***	4.957

*, **, *** indicate significance at the 90%, 95% and 99% confidence levels, respectively.

On average, MNCs are shown to have higher agency costs of debt, lower business risk, larger firm size, lower tangibility, and higher profitability than DCs. These differences are found to be consistent with existing literature. Table 3 provides the correlation analysis for the observed explanatory variables. The correlation coefficients are generally below 0.40 and consistent for all samples but only the results of MNC10 and DC are reported for brevity.

4.2 Analysis by MNCs and DC

Hausman test consistently support the fixed effects over random effects panel data regressions. These findings are in line with Doukas and Pantzalis (2003). They find that the fixed effects model better explains their dataset in examining the effect of the agency costs of debt on leverage caused by internationalization. Table 3 reports the estimates of fixed effects panel data regression.

Panel A shows that agency costs is inversely related to MNCs long-term debt ratio, significant at the 1% level, which is consistent across the samples, and also with previous studies (Akhtar and Oliver, 2009; Burgman, 1996; Chen et al., 1997; Doukas and Pantzalis, 2003; Fatemi, 1988; Lee and Kwok, 1988). Similarly, negative relationship is reported for DC. Nonetheless, business risk is found to be insignificant for MNCs and DCs. Degree of internationalization is also found to have insignificant effects on the long-term debt level of MNCs. In Panel B, we add the non-linearity of degree of internationalization to control for any potential non-linear relationship between the degree of internationalization and leverage. The square of foreign sales ratio is included to proxy for non-linear degree of internationalization. Estimates show that the insignificant degree of internationalization in Panel A is not caused by the perceived non-linear relationship.

For the control variables, only size and profitability have the predicted significant effects on MNCs' leverage. Larger size MNCs (except MNC50) tend to use long-term debt financing because these firms are expected to have lower financial distress costs and face less information asymmetry (Deesomsak et al., 2004). Conversely, profitable MNCs have lower long-term debt because retained earnings are the preferred financing choice for these firms. As for the DCs, the leverage decision is significantly affected by the firm size, tangibility, and profitability as expected, which support the trade-off theory and pecking order hypothesis.

Table 2
Correlation Matrix of the Observed Variables for MNC10 and DC

Panel A: MNC10

	Agency cost	**Business risk**	**DOI**	**Size**	**Tangibility**	**Profitability**	**Dummy both**	**Dummy crisis**	**QE**
Degree of internationalization (DOI)									
Agency cost	1.000								
Business risk	0.056***	1.000							
Degree of internationalization (DOI)	0.070***	0.021	1.000						
Size	0.108***	-0.035**	0.039**	1.000					
Tangibility	-0.050***	0.012	-0.022	0.174***	1.000				
Profitability	0.214***	-0.036**	0.007	0.252***	0.069***	1.000			
Dummy both	-0.023	0.042**	0.019	0.125***	-0.049***	-0.093***	1.000		
Dummy crisis	-0.003	0.026	0.058***	0.038**	-0.035**	0.001	0.030*	1.000	
Quantitative easing (QE)	-0.037**	-0.014	0.106***	0.078***	0.078***	-0.019*	-0.036**	-0.014	1.000

Panel B: DCs

	Agency cost	**Business risk**	**Size**	**Tangibility**	**Profitability**	**Dummy both**	**Dummy crisis**	**QE**
Agency cost	1.000							
Business risk	0.144***	1.000						
Size	-0.024	-0.132***	1.000					
Tangibility	-0.106***	-0.037**	0.139***	1.000				
Profitability	-0.109***	-0.351***	0.241***	0.098***	1.000			
Dummy both	0.056***	0.049***	0.092***	-0.024	-0.112***	1.000		
Dummy crisis	-0.034*	-0.009	0.049***	0.000	-0.039**	-0.004	1.000	
Quantitative easing (QE)	-0.026	-0.023	0.086***	0.0085	-0.034**	-0.005	0.027	1.000

*, **, *** indicate significance at the 90%, 95% and 99% confidence levels, respectively.

Table 3
Analysis by MNCs and DCs on Leverage and Types of Debt

Panel A: Model 1

	MNC10			MNC25			MNC50			DC		
	LTDebt	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**
Agency cost	-0.046***	-0.002	-0.044***	-0.038***	0.001	-0.040***	-0.033***	0.005	-0.038***	-0.036***	-0.003***	-0.033***
	(13.91)	(1.08)	(14.21)	(10.02)	(0.82)	(11.02)	(5.77)	(1.63)	(7.39)	(10.70)	(2.96)	(9.89)
Business risk	-0.026	-0.010	-0.016	-0.031	-0.000	-0.031	0.057	0.072***	-0.014	0.001	-0.000	0.001*
	(1.11)	(1.00)	(0.71)	(1.23)	(0.01)	(1.30)	(1.54)	(3.64)	(0.43)	(1.59)	(0.98)	(1.91)
Degree of internationalization	-0.024	0.015	-0.040*	0.005	0.028**	-0.023	0.047	0.057*	-0.009			
	(1.11)	(1.61)	(1.93)	(0.20)	(2.25)	(0.92)	(0.85)	(1.91)	(0.18)			
Size	0.009*	-0.006***	0.015***	0.013**	-0.008***	0.020***	0.010	-0.006	0.015	0.025***	-0.003**	0.028***
	(1.73)	(2.84)	(3.16)	(2.22)	(2.84)	(3.77)	(0.87)	(0.97)	(1.55)	(5.13)	(1.99)	(5.80)
Tangibility	0.030	-0.049***	0.079**	0.049	-0.061***	0.110***	-0.012	-0.109***	0.097	0.194***	-0.016	0.209***
	(0.80)	(2.97)	(2.24)	(1.11)	(2.95)	(2.65)	(0.17)	(2.84)	(1.49)	(6.32)	(1.65)	(6.89)
Profitability	-0.241***	-0.077***	-0.164***	-0.390***	-0.148***	-0.242***	-0.389***	-0.218***	-0.171***	-0.118***	-0.019***	-0.099***
	(10.78)	(7.81)	(7.75)	(11.86)	(9.56)	(7.79)	(7.55)	(8.01)	(3.70)	(7.93)	(4.23)	(6.70)
Dummy both	0.030***	0.063***	-0.033***	0.035***	0.062***	-0.026***	0.017	0.046***	-0.029***	0.053***	0.094***	-0.041***
	(5.34)	(25.24)	(6.18)	(5.45)	(20.16)	(4.29)	(1.59)	(8.28)	(3.11)	(6.90)	(39.68)	(5.38)
Dummy crisis	0.003	0.001	0.002	0.003	0.001	0.002	0.002	0.002	0.000	0.014***	0.002	0.012***
	(0.91)	(0.84)	(0.57)	(0.87)	(0.45)	(0.70)	(0.41)	(0.64)	(0.07)	(3.43)	(1.45)	(3.01)
Quantitative easing	0.000	-0.003*	0.003	0.001	-0.003	0.004	-0.009	-0.004	-0.005	0.014***	0.001	0.014***
	(0.04)	(1.88)	(0.92)	(0.24)	(1.57)	(1.03)	(1.31)	(1.16)	(0.78)	(3.40)	(0.41)	(3.31)
Constant	0.165***	0.072***	0.092**	0.110**	0.079***	0.030	0.115	0.051	0.064	-0.003	0.035***	-0.038
	(4.03)	(4.01)	(2.39)	(2.28)	(3.50)	(0.67)	(1.25)	(1.05)	(0.78)	(0.08)	(3.30)	(1.11)
Adjusted R^2	-0.10	0.00	-0.11	-0.09	-0.01	-0.13	-0.24	-0.16	-0.27	-0.09	0.22	-0.12
N	3,449	3,449	3,449	2,425	2,425	2,425	949	949	949	3,328	3,328	3,328

Panel B:Model 2

	MNC10			MNC25			MNC50			DC		
	LTDebt	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**
Agency cost	-0.046***	-0.002	-0.044***	-0.038***	0.001	-0.040***	-0.034***	0.005	-0.039***	-0.036***	-0.003***	-0.033***
	(13.91)	(1.08)	(14.21)	(10.01)	(0.82)	(11.01)	(5.81)	(1.58)	(7.40)	(10.70)	(2.96)	(9.89)
Business risk	-0.026	-0.010	-0.016	-0.031	0.000	-0.031	0.059	0.073***	-0.014	0.001	-0.000	0.001*
	(1.11)	(1.00)	(0.70)	(1.21)	(0.00)	(1.28)	(1.58)	(3.69)	(0.41)	(1.59)	(0.98)	(1.91)
Degree of internationalization	-0.001	0.015	-0.016	0.070	0.041	0.029	-0.522	-0.257	-0.265			
	(0.02)	(0.50)	(0.26)	(0.68)	(0.84)	(0.30)	(1.21)	(1.13)	(0.69)			
Nonlinear degree of internationalization	-0.023	0.000	-0.023	-0.058	-0.011	-0.047	0.401	0.221	0.180			
	(0.36)	(0.02)	(0.39)	(0.65)	(0.27)	(0.55)	(1.34)	(1.39)	(0.67)			
Size	0.009*	-0.006***	0.015***	0.013**	-0.008***	0.020***	0.011	-0.005	0.016	0.025***	-0.003**	0.028***
	(1.72)	(2.83)	(3.14)	(2.18)	(2.85)	(3.73)	(0.96)	(0.88)	(1.59)	(5.13)	(1.99)	(5.80)
Tangibility	0.030	-0.049***	0.079**	0.048	-0.062***	0.109***	-0.008	-0.106***	0.099	0.194***	-0.016	0.209***
	(0.79)	(2.97)	(2.23)	(1.08)	(2.96)	(2.62)	(0.11)	(2.78)	(1.52)	(6.32)	(1.65)	(6.89)
Profitability	-0.240***	-0.077***	-0.163***	-0.389***	-0.148***	-0.241***	-0.392***	-0.220***	-0.172***	-0.118***	-0.019***	-0.099***
	(10.74)	(7.80)	(7.71)	(11.78)	(9.52)	(7.73)	(7.60)	(8.06)	(3.72)	(7.93)	(4.23)	(6.70)
Dummy both	0.030***	0.063***	-0.033***	0.035***	0.062***	-0.026***	0.017	0.046***	-0.029***	0.053***	0.094***	-0.041***
	(5.34)	(25.24)	(6.17)	(5.45)	(20.16)	(4.28)	(1.59)	(8.30)	(3.10)	(6.90)	(39.68)	(5.38)
Dummy crisis	0.003	0.001	0.002	0.003	0.001	0.002	0.003	0.002	0.001	0.014***	0.002	0.012***
	(0.90)	(0.84)	(0.56)	(0.84)	(0.44)	(0.67)	(0.45)	(0.69)	(0.10)	(3.43)	(1.45)	(3.01)
Quantitative easing	0.000	-0.003*	0.003	0.001	-0.003	0.004	-0.008	-0.004	-0.004	0.014***	0.001	0.014***
	(0.02)	(1.87)	(0.90)	(0.20)	(1.58)	(1.00)	(1.15)	(0.99)	(0.69)	(3.40)	(0.41)	(3.31)
Constant	0.160***	0.073***	0.088**	0.095*	0.077***	0.019	0.302*	0.154*	0.148	-0.003	0.035***	-0.038
	(3.77)	(3.85)	(2.19)	(1.79)	(3.06)	(0.37)	(1.80)	(1.74)	(0.99)	(0.08)	(3.30)	(1.11)
Adjusted R^2	-0.10	0.00	-0.11	-0.09	-0.01	-0.13	-0.24	-0.15	-0.27	-0.09	0.22	-0.12
N	3,449	3,449	3,449	2,425	2,425	2,425	949	949	949	3,328	3,328	3,328

*, **, *** indicate significance at the 90%, 95% and 99% confidence levels, respectively.

Interesting findings are observed when we examine the debt structure of MNCs by convertible and non-convertible debt. The estimates show that both MNCs and DCs decrease their long-term debt by decreasing non-convertible debt as the agency costs increases, which is consistently significant at the 1% level. Nonetheless, the negative impact of agency costs on long-term debt is alleviated by convertible debt suggested by the positive coefficient (though insignificant), specifically at a higher degree of internationalization (MNC50). But for the DCs, the decrease in long-term debt is intensified by the decrease in convertible debt, significant at the 1% level.

Riskier MNCs, for example those in MNC50 are found to prefer convertible debt to mitigate the increased risk associated with the greater extent of internationalization. But, this relationship is insignificant for DCs. Degree of internationalization is positively related to convertible debt, significant at the 5% level for MNC25, but the significant level decreases to 10% for MNC50. Conversely, negative relationship is reported between the degree of internationalization and non-convertible debt only for MNC10, marginally significant at the 10% level.

Taken together, MNCs' level of convertible debt is positively affected by the degree of internationalization but the relative impact decreases as the degree of internationalization increases from 25% (MNC25) to 50% (MNC50). As MNCs further increase their extent of internationalization to 50% or more, business risk becomes the key consideration that influence MNCs' decision to use convertible debt to mitigate the higher expected financial distress costs. Consequently, MNCs are able to moderate the negative impact on long-term debt as business risk increases. These findings remain consistent for Model 2 (Panel B).

For the control variables, the coefficients are mostly significant and consistent with the hypothesized signs. For example, MNCs with smaller firm size, lower tangibility and less profitable prefer convertible debt and the opposite for non-convertible debt. The same findings also apply for DCs. But, as the degree of internationalization increases to 50% or more, the relative impact of business risk outweighs the impact of firm size in affecting the level of convertible debt. Probably this trade off implies that at a higher level of internationalization, convertible debt is not only preferred by the smaller size MNCs but also the larger size MNCs to mitigate the increasing business risk.

Our results remain consistent even controlling for market conditions. Global financial crisis is found to have insignificant effect on the MNCs' long-term debt ratio and choice between convertible and non-convertible debt. But, during the subsequent quantitative easing period, MNCs in MNC10 are found to use less convertible debt, indicated by the marginally significant negative coefficient at the 10% level. But as the extent of internationalization increases, the effects of this policy on the decision to issue convertible debt becomes insignificant. We argue that convertible debt is still the preferred choice when the relative impact of agency costs and business risk are greater than the impact of quantitative easing policy as the degree of internationalization increases. But these two market variables are shown to have positive effects on DCs' long-term debt ratio, which is contributed by the use of non-convertible debt.

4.3 Comparison between NASDAQ and non-NASDAQ-listed Firms

Convertible debt issuers are claimed to be smaller and riskier growth firms (Lewis et al., 1999), thus are more reluctant to issue straight debt because higher fixed debt obligation tends to increase the expected cost of financial distress. Moreover, these firms would not issue equity if the current stock price does not reflect the firms' growth opportunities (Chang et al., 2004; Stein, 1992). In order to take this argument into consideration, we distinguish MNCs and DCs by NASDAQ and non-NASDAQ-listed firms. NASDAQ provides a platform for small firms and venture-capital firms,

Table 4
Analysis by NASDAQ and non-NASDAQ-listed MNCs and DCs on Leverage and Types of Debt

Panel A: NASDAQ-listed firms

	MNC10			MNC25			MNC50			DC		
	LTDebt	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**
Agency cost	-0.027***	0.003	-0.030***	-0.011	0.011**	-0.022***	0.008	0.019**	-0.011*	-0.029***	-0.002	-0.027***
	(4.18)	(0.72)	(5.47)	(1.46)	(2.18)	(3.48)	(0.82)	(2.38)	(1.79)	(6.59)	(1.35)	(6.28)
Business risk	-0.037	-0.032*	-0.005	-0.028	-0.023	-0.005	0.038	0.038	-0.000	0.001	-0.000	0.001*
	(1.45)	(1.94)	(0.22)	(0.98)	(1.19)	(0.21)	(0.94)	(1.13)	(0.01)	(1.37)	(0.93)	(1.75)
Degree of internationalization	-0.015	0.004	-0.020	0.026	0.012	0.014	-0.047	0.022	-0.069			
	(0.38)	(0.17)	(0.58)	(0.53)	(0.36)	(0.33)	(0.50)	(0.28)	(1.12)			
Size	0.016*	-0.000	0.017**	0.013	-0.000	0.013	0.036*	0.018	0.017	0.035***	-0.006***	0.041***
	(1.80)	(0.07)	(2.17)	(1.21)	(0.01)	(1.44)	(1.77)	(1.08)	(1.31)	(5.19)	(2.60)	(6.29)
Tangibility	-0.048	-0.162***	0.114	-0.022	-0.192**	0.170*	0.064	-0.039	0.103	0.263***	0.004	0.259***
	(0.53)	(2.72)	(1.46)	(0.20)	(2.53)	(1.80)	(0.41)	(0.29)	(0.99)	(5.99)	(0.25)	(6.07)
Profitability	-0.273***	-0.178***	-0.096***	-0.248***	-0.194***	-0.054	-0.352***	-0.314***	-0.038	-0.078***	-0.018***	-0.061***
	(6.91)	(6.91)	(2.85)	(5.36)	(6.17)	(1.39)	(5.23)	(5.56)	(0.86)	(4.76)	(3.00)	(3.79)
Dummy both	0.019*	0.044***	-0.025***	0.012	0.037***	-0.024**	-0.019	-0.020	0.001	0.048***	0.102***	-0.054***
	(1.68)	(6.05)	(2.65)	(0.91)	(4.01)	(2.15)	(0.90)	(1.15)	(0.10)	(3.98)	(23.95)	(4.68)
Dummy crisis	-0.001	-0.002	0.001	0.005	-0.004	0.009	0.010	-0.000	0.010	0.010*	0.002	0.009
	(0.10)	(0.45)	(0.23)	(0.70)	(0.78)	(1.46)	(0.88)	(0.05)	(1.40)	(1.80)	(0.83)	(1.55)
Quantitative easing	-0.010	-0.011***	0.001	-0.007	-0.010*	0.003	-0.013	-0.017*	0.005	0.003	-0.001	0.005
	(1.57)	(2.59)	(0.13)	(0.86)	(1.80)	(0.44)	(1.09)	(1.77)	(0.60)	(0.57)	(0.54)	(0.78)
Constant	0.091	0.078*	0.013	0.068	0.071	-0.003	-0.065	-0.078	0.012	-0.071*	0.046***	-0.117***
	(1.37)	(1.80)	(0.24)	(0.87)	(1.34)	(0.05)	(0.49)	(0.69)	(0.14)	(1.73)	(3.12)	(2.92)
Adjusted R^2	-0.26	-0.24	-0.30	-0.39	-0.32	-0.41	-0.44	-0.38	-0.62	-0.14	0.12	-0.15
N	1,039	1,039	1,039	707	707	707	299	299	299	1,664	1,664	1,664

Panel B: Non-NASDAQ-listed firms

	MNC10			MNC25			MNC50			DC		
	LTDebt	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**
Agency cost	-0.054***	-0.004***	-0.050***	-0.047***	-0.003**	-0.044***	-0.055***	-0.003	-0.052***	-0.045***	-0.005***	-0.040***
	(13.98)	(3.05)	(13.29)	(10.63)	(2.01)	(10.13)	(7.69)	(1.20)	(7.57)	(8.61)	(3.59)	(7.63)
Business risk	-0.107	0.042*	-0.149*	-0.160*	0.114***	-0.274***	-0.213	0.136***	-0.349***	0.002	-0.001	0.003
	(1.35)	(1.71)	(1.91)	(1.73)	(3.53)	(3.02)	(1.53)	(3.01)	(2.60)	(0.94)	(0.93)	(1.17)
Degree of internationalization	-0.034	0.025***	-0.060**	-0.026	0.035***	-0.061**	0.035	0.021	0.015			
	(1.33)	(3.17)	(2.35)	(0.82)	(3.27)	(2.00)	(0.50)	(0.90)	(0.22)			
Size	0.004	-0.008***	0.012**	0.012*	-0.011***	0.022***	0.002	-0.012***	0.014	0.014**	0.001	0.013*
	(0.71)	(4.41)	(2.11)	(1.72)	(4.64)	(3.41)	(0.11)	(2.79)	(1.06)	(1.99)	(0.40)	(1.87)
Tangibility	0.049	-0.019	0.068*	0.044	-0.031*	0.075	-0.044	-0.127***	0.083	0.102**	-0.038***	0.140***
	(1.19)	(1.53)	(1.70)	(0.94)	(1.90)	(1.63)	(0.54)	(4.80)	(1.06)	(2.40)	(3.44)	(3.26)
Profitability	-0.226***	-0.027***	-0.199***	-0.599***	-0.095***	-0.504***	-0.426***	-0.098***	-0.329***	-0.350***	-0.018*	-0.333***
	(8.27)	(3.15)	(7.43)	(12.22)	(5.57)	(10.50)	(5.55)	(3.91)	(4.44)	(9.75)	(1.89)	(9.20)
Dummy both	0.035***	0.070***	-0.035***	0.043***	0.071***	-0.028***	0.027**	0.069***	-0.042***	0.059***	0.089***	-0.030***
	(5.39)	(34.96)	(5.51)	(5.85)	(28.03)	(3.98)	(2.23)	(17.70)	(3.65)	(5.94)	(34.88)	(3.05)
Dummy crisis	0.004	0.002*	0.002	0.003	0.002	0.000	0.000	0.004*	-0.004	0.015***	0.002	0.013**
	(1.17)	(1.73)	(0.64)	(0.69)	(1.61)	(0.13)	(0.06)	(1.69)	(0.51)	(2.85)	(1.41)	(2.47)
Quantitative easing	0.005	-0.000	0.006	0.005	-0.001	0.006	-0.004	0.002	-0.006	0.020***	0.002	0.018***
	(1.30)	(0.37)	(1.44)	(1.04)	(0.83)	(1.36)	(0.49)	(0.69)	(0.74)	(3.54)	(1.43)	(3.15)
Constant	0.215***	0.066***	0.149***	0.165***	0.087***	0.078	0.244*	0.128***	0.116	0.121**	0.018	0.102*
	(4.16)	(4.14)	(2.94)	(2.75)	(4.17)	(1.33)	(1.96)	(3.17)	(0.97)	(2.18)	(1.29)	(1.83)
Adjusted R^2	-0.03	0.26	-0.04	0.05	0.25	0.01	-0.11	0.23	-0.11	0.00	0.37	-0.04
N	2,410	2,410	2,410	1,718	1,718	1,718	650	650	650	1,664	1,664	1,664

*, **, *** indicate significance at the 90%, 95% and 99% confidence levels, respectively.

mostly the high-tech and high growth firms to raise funds (Loughran, 1997; Schwert, 2002). If smaller and riskier growth firms tend to issue convertible debt, then NASDAQ-listed MNCs and DCs are expected to use more convertible debt and less non-convertible debt in the presence of agency costs and business risk.

Table 4 reports the results for NASDAQ-listed firms (Panel A) and non-NASDAQ-listed firms (Panel B). In the presence of agency costs, NASDAQ-listed MNCs and DCs decrease their long-term debt by decreasing non-convertible debt. Nonetheless, NASDAQ-listed MNCs, those in MNC25 and MNC50 are found to mitigate the negative effects of agency costs by issuing convertible debt. Results also indicate the importance of agency costs in influencing NASDAQ-listed MNCs' levels of convertible debt when the measure of internationalization increases to 25% and more. But, insignificant result is observed for the NASDAQ-listed DCs.

In comparison, non-NASDAQ-listed MNCs, in particular MNC10 and MNC25, use convertible debt to mitigate the negative effect on long-term debt as the degree of internationalization increases. Also, these MNCs opt for convertible debt as business risk increases.This implies that non-NASDAQ-listed MNCs issue convertible debt to mitigate the risk associated with higher degree of internationalization. Reasonably, MNCs face additional financial distress costs, such as exchange rate risk and political risk, as they further expand their business abroad. Hence, MNCs are less likely to issue debt with higher fixed obligation such as straight debt (Jen, et al., 1997) or equivalent non-convertible debt.

For the non-NASDAQ-listed DCs, business risk has insignificant effect on the long-term debt as well as the choice between convertible and non-convertible debt. Instead, as the agency costs of debt increases, DCs decrease their long-term debt by decreasing both the convertible and non-convertible debt. In brief, NASDAQ-listed MNCs that are more likely to be smaller and riskier growth firms tend to issue convertible debt to the mitigate agency costs of debt that arises from international diversification. On the contrary, non-NASDAQ-listed MNCs issue convertible debt to mitigate the risk associated with the increasing degree of internationalization. But these findings are not applicable for the NASDAQ and non-NASDAQ-listed DCs. Therefore, these results indicate that the decision to issue convertible debt is also linked to internationalization.

4.4 Comparison between Small and Large Size Firms

Firm size is found to have significant effect on firms' leverage. Large size firms are more mature and established, thus are able to tolerate higher leverage, given the lower financial distress costs (Lewis et al., 1999; Mittoo and Zhang, 2008; Rajan and Zingales, 1995). Large firms are claimed to prefer straight debt or the equivalent non-convertible debt as compared to small firms that are more likely to issue convertible debt (Lewis et al., 1999). Therefore, to examine the potential effects of firm size on debt structure in relation to the degree of internationalization, we rank the MNCs and DCs by their total assets to classify the firms into Bottom30 and Top30 accordingly. For the Bottom30, it consists of firms with total assets of approximately $446 million to $10 million, whereas for the Top30, it consists of firms with total assets of approximately $2,822 million and above.

Table 5 reports the results for Bottom30 (Panel A) and Top30 (Panel B) firms. For the Bottom30 MNCs, convertible debt is positively affected by the business risk and firm size. As business risk increases, MNCs; those in MNC10 and MNC25 tend to have convertible debt in their debt structure, significant at the 1% level. Additionally, larger size MNCs in Bottom30 are found to use convertible debt instead of non-convertible debt, but it is the opposite for DCs. Conversely, Bottom30 MNCs decrease their non-convertible debt to mitigate the negative effects of agency

Table 5

Analysis by Small and Large Size MNCs and DCs on Leverage and Types of Debt

Panel A: Bottom30 firms

	MNC10			MNC25			MNC50			DC		
	LTDebt	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**
Agency costs	-0.038***	-0.002	-0.036***	-0.033***	0.004	-0.037***	-0.015	0.011	-0.026**	-0.033***	-0.002	-0.031***
	(5.42)	(0.48)	(5.70)	(3.93)	(0.88)	(4.88)	(1.41)	(1.50)	(2.59)	(7.18)	(1.36)	(6.92)
Degree of internationalization	-0.073	-0.008	-0.065	0.000	0.002	-0.002	-0.085	-0.077	-0.008			
	(1.55)	(0.35)	(1.51)	(0.00)	(0.08)	(0.04)	(0.80)	(1.10)	(0.08)			
Business risk	0.047	0.051***	-0.004	0.046	0.041***	0.005	0.042	0.041	0.001	0.001	-0.000	0.001*
	(1.48)	(3.19)	(0.13)	(1.53)	(2.63)	(0.18)	(1.01)	(1.50)	(0.02)	(1.42)	(1.16)	(1.82)
Size	0.040***	0.019***	0.021*	0.050***	0.029***	0.021	0.096***	0.058***	0.038	0.026***	-0.003	0.029***
	(2.91)	(2.79)	(1.66)	(3.36)	(3.70)	(1.59)	(3.00)	(2.74)	(1.29)	(3.31)	(1.11)	(3.74)
Tangibility	0.068	-0.110	0.178	0.067	-0.165**	0.232	-0.263	-0.389**	0.126	0.216***	-0.008	0.225***
	(0.50)	(1.61)	(1.44)	(0.43)	(2.01)	(1.64)	(0.91)	(2.04)	(0.47)	(5.23)	(0.67)	(5.56)
Profitability	-0.134***	-0.080***	-0.054	-0.195***	-0.174***	-0.021	-0.337***	-0.309***	-0.028	-0.107***	-0.017***	-0.090***
	(2.67)	(3.20)	(1.17)	(3.59)	(6.11)	(0.44)	(4.64)	(6.43)	(0.41)	(5.41)	(2.86)	(4.64)
Dummy both	0.041**	0.051***	-0.010	0.036*	0.037***	-0.000	0.084**	0.039*	0.044	0.071***	0.108***	-0.037***
	(2.20)	(5.42)	(0.57)	(1.74)	(3.37)	(0.02)	(2.53)	(1.79)	(1.46)	(4.91)	(24.41)	(2.65)
Dummy crisis	0.004	-0.002	0.006	0.007	-0.008	0.015*	0.003	-0.012	0.015	0.001	0.002	-0.001
	(0.54)	(0.43)	(0.83)	(0.77)	(1.64)	(1.81)	(0.21)	(1.14)	(1.05)	(0.18)	(0.99)	(0.13)
Quantitative easing	-0.027***	-0.013***	-0.015*	-0.029***	-0.015***	-0.014	-0.015	-0.011	-0.004	-0.000	-0.001	0.001
	(3.03)	(2.79)	(1.79)	(2.85)	(2.89)	(1.49)	(1.01)	(1.14)	(0.28)	(0.04)	(0.60)	(0.14)
Constant	-0.015	-0.048	0.033	-0.112	-0.092*	-0.021	-0.253	-0.148	-0.105	-0.011	0.023*	-0.034
	(0.17)	(1.11)	(0.43)	(1.22)	(1.90)	(0.25)	(1.30)	(1.15)	(0.58)	(0.26)	(1.88)	(0.86)
Adjusted R^2	-0.33	-0.28	-0.40	-0.34	-0.11	-0.46	-0.07	0.13	-0.65	-0.23	0.12	-0.25
N	529	529	529	364	364	364	158	158	158	1,504	1,504	1,504

Panel B: Top30 firms

	MNC10			MNC25			MNC50			DC		
	LTDebt	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**	**LTDebt**	**CNV**	**NonCNV**
Agency costs	-0.044***	-0.001	-0.042***	-0.043***	-0.002	-0.041***	-0.036***	-0.000	-0.035***	-0.017*	-0.003**	-0.014
	(9.23)	(0.91)	(9.03)	(8.15)	(1.04)	(7.93)	(4.39)	(0.02)	(4.46)	(1.90)	(2.40)	(1.48)
Business risk	-0.032	0.055**	-0.087	-0.006	0.114***	-0.121	-0.265*	0.096*	-0.361***	0.013	0.009	0.004
	(0.46)	(2.40)	(1.26)	(0.07)	(3.75)	(1.47)	(1.93)	(1.85)	(2.68)	(0.28)	(1.27)	(0.08)
Degree of internationalization	-0.020	0.013	-0.033	0.014	0.007	0.006	0.014	0.039	-0.025			
	(0.61)	(1.17)	(1.01)	(0.35)	(0.50)	(0.17)	(0.16)	(1.19)	(0.30)			
Size	0.009	-0.009***	0.017**	0.019**	-0.013***	0.032***	0.049***	-0.011	0.060***	0.043***	0.002	0.041***
	(1.14)	(3.36)	(2.27)	(2.14)	(4.00)	(3.67)	(2.66)	(1.58)	(3.32)	(3.01)	(0.79)	(2.80)
Tangibility	0.067	-0.037**	0.104**	0.062	-0.074***	0.136**	-0.021	-0.078*	0.056	0.265***	-0.004	0.269***
	(1.25)	(2.14)	(1.98)	(0.98)	(3.22)	(2.20)	(0.20)	(1.89)	(0.53)	(2.93)	(0.31)	(2.89)
Profitability	-0.515***	-0.117***	-0.397***	-0.451***	-0.139***	-0.312***	-0.573***	-0.207***	-0.366***	-0.512***	0.004	-0.516***
	(10.98)	(7.62)	(8.57)	(8.80)	(7.45)	(6.22)	(5.73)	(5.46)	(3.72)	(5.83)	(0.30)	(5.69)
Dummy both	0.023***	0.050***	-0.027***	0.040***	0.055***	-0.015*	0.001	0.048***	-0.047***	-0.030*	0.037***	-0.067***
	(3.08)	(20.50)	(3.70)	(4.71)	(17.74)	(1.79)	(0.08)	(8.22)	(3.09)	(1.75)	(13.90)	(3.78)
Dummy crisis	0.004	0.002*	0.001	0.002	0.003**	-0.001	-0.005	0.005	-0.010	0.035***	-0.001	0.037***
	(0.96)	(1.84)	(0.36)	(0.50)	(2.11)	(0.28)	(0.61)	(1.56)	(1.22)	(4.49)	(0.95)	(4.50)
Quantitative easing	0.007	-0.002	0.010**	0.005	-0.003	0.008	-0.017	0.001	-0.018*	0.028***	0.001	0.028***
	(1.57)	(1.55)	(2.11)	(0.89)	(1.47)	(1.46)	(1.61)	(0.22)	(1.72)	(3.32)	(0.49)	(3.15)
Constant	0.164**	0.096***	0.068	0.046	0.147***	-0.101	-0.165	0.111	-0.276	-0.224	-0.008	-0.216
	(2.15)	(3.81)	(0.90)	(0.53)	(4.59)	(1.17)	(0.88)	(1.56)	(1.49)	(1.58)	(0.36)	(1.48)
Adjusted R^2	0.01	0.15	-0.02	0.00	0.15	-0.04	-0.11	-0.03	-0.11	0.03	0.14	0.03
N	1,459	1,459	1,459	1,056	1,056	1,056	373	373	373	574	574	574

*, **, *** indicate significance at the 90%, 95% and 99% confidence levels, respectively

costs, but the net negative effects on the long-term debt can be moderated by convertible debt as the MNCs further expand their operations internationally.

For the Top30 MNCs, business risk is positively related to convertible debt. Consistently, MNCs are found to use convertible debt instead of non-convertible debt to mitigate the negative effect of business risk on the long-term debt. Agency costs of debt are found to have insignificant effect on the MNCs' levels of convertible debt, but it has significantly negative effect on the DCs' levels of convertible debt. Taken together, these findings suggest that the decision to use convertible debt in mitigating either the agency costs or business risk is related to internationalization.

5. Conclusion

Conceptually, MNCs are able to sustain higher levels of long-term debt than DCs because MNCs are of larger firm size, have lower bankruptcy risk and greater access to international capital markets. Nonetheless, empirical evidence has shown otherwise. One key limitation is these studies assume long-term debt as homogenous. Motivated by this limitation and the differences between MNCs and DCs, as well as the increasing importance of globalised markets due to trade liberalization, this study examines the debt financing decision of MNCs when the analyses are extended to account for debt heterogeneity.

This study recognizes the long-term debt by convertible and non convertible debt because the embedded equity option of convertible debt is claimed to be able to mitigate agency costs of debt and business risk. Results show that MNCs decrease the levels of long-term debt by decreasing non-convertible to mitigate agency costs of debt and business risk. But, the net decrease in the long-term debt is moderated by the increase in the levels of convertible debt. The findings of this study provide a significant justification that allows MNCs to sustain higher levels of long-term debt. In brief, MNCs can use convertible debt to mitigate the increasing agency costs of debt and business risk to maximize the benefits of internationalization.

Acknowledgement

We appreciate helpful comments and suggestions from Hamish Anderson, Alastair Marsden, Ralph Walkling, and Jin-Xin Wang; seminar participants at Massey University, Palmerston North New Zealand.

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