DOES EFFECTIVE MONITORING BY THE BOARD OF DIRECTORS AFFECT THE RELATIONSHIP BETWEEN GLOBAL DIVERSIFICATION AND FINANCIAL LEVERAGE?

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Abstract

Research investigating the relationship between global diversification and financial leverage has produced mixed results. Some studies found that global diversification improves the firm's debt capacity and, as a result, increases its degree of financial leverage. Other studies found that global diversification increases firm risk and, as a result, decreases its debt capacity and the degree of financial leverage. In this study, we suggest that monitoring by the board of directors and related committees moderates the relationship between global diversification and the degree of financial leverage. Specifically, in firms with vigilant (passive) monitoring, the relationship between global diversification and the degree of financial leverage is positive (negative). Using a sample of 6,188 firm-year observations over the period 2002 through 2006, we find support for the hypothesis.

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1 Introduction

Basic finance theory suggests that financial leverage (debt) influences firm value (Stulz, 1990). Specifically, when changes in external variables lead to increases (decreases) in the firm's degree of financial leverage, this is usually accompanied by an increase (decrease) in stock price (Harris and Raviv, 1991). Consequently, it is important to identify firm attributes (such as global diversification) that influence the degree of financial leverage in the firm's capital structure.

In terms of the relationship between corporate international activities and financial leverage, the implications of diversification theory suggest that because multinational corporations (MNCs) operate in several less than perfectly correlated markets, MNCs should experience less income volatility than do domestic firms and, as a result, should utilize more debt in their capital structure. Consistent with theory, several studies find a negative relationship between the degree of internationalization and firm risk (e.g., Agmon and Lessard, 1977; Fatemi, 1984) and cost of debt (e.g., Reeb et al.,, Mansi, and Allee, 2001; Mansi and Reeb, 2002). However, despite the notion that internationalization may work to reduce firm risk and

the cost of debt capital, studies that examine the capital structure of multinational firms find that domestic firms are more financially leveraged than are multinational firms (e.g., Burgman, 1996; Chen, Cheng, He, and Kim, 1997).

While there is extensive research on the determinants of capital structure (see Harris and Raviv, 1991 for a survey), there are few papers that examine the relationship between global diversification and the degree of financial leverage in the firm's capital structure. According to Burgman (1996), "most of the empirical literature on capital structure has either completely ignored international factors, or implicitly assumed that they are adequately proxied by the standard business risk measures." In addition, the results of research on the implications of global diversification on capital structure are far from conclusive. Specifically, some studies document negative relationship between global diversification and financial leverage (e.g., Chen, Cheng, He, and Kim, 1997; Doukas and Pantzalis, 2003) while other studies report a positive relationship (e.g., Kedia and Mozumdar, 2003; Reeb and Mansi, 2001, 2002).

There are several theoretical arguments to support the notion that MNCs should use more financial leverage in their capital structure than do

domestic firms. For example, because they operate in more than one geographic market, MNCs have multiple sources of capital compared to domestic firms. As long as financial markets are not perfectly correlated, MNCs may benefit by borrowing through their foreign subsidiaries located in markets in which the cost of debt (e.g., the interest rate) is lower than that of the domestic market (Denis, Denis, and Yost, 2002). Further, a MNC may lower its overall tax expense by raising debt capital in foreign markets where it has high income before tax or in foreign markets where the statutory tax rate is higher than that in the local markets (Bodnar, Tang, and Weintrop, 1999).

A second reason why MNCs should utilize more debt than do domestic firms is related to the benefits of debt in hedging risks (e.g., foreign exchange and political risks) associated with foreign involvement (Doukas and Pantzalis, 2003). Third, because MNCs derive their income from multiple geographic markets, they are more diversified than purely domestic firms. Accordingly, to the extent that economic activities in these markets are not perfectly correlated, the business and financial risks of MNCs should be lower than those of domestic corporations (e.g., Kedia and Mozumdar (2003). Based on such factors as risk diversification, hedging, and liquidity, MNCs are likely to utilize a high degree of financial leverage in their capital structure. However, empirical evidence in the international accounting/finance literature indicate that, compared with purely domestic firms, MNCs use less debt in their capital structure (e.g., Chen et al., 1997; Lee and Kwok, 1988, and Fatemi, 1984). This raises an important question: Why MNCs do not take advantage of the tax shield advantage of interest and use more debt in their capital structure?

The separation of ownership and control may create a situation where the interests of the firm's top managers conflict with those of shareholders. In addition, the complexity stemming from global operations (due to such factors as cultural and language differences) exacerbates the degree of information asymmetry between managers and investors and makes it difficult for investors to evaluate the decisions made by managers (e.g., Duru and Reeb, 2002). Hence, the MNCs financing decisions could be viewed as an example of the agency relationship between management and investors (e.g., Jensen & Meckling, 1976). In line with this view, May (1995) found that managers consider personal risk when making capital structure decisions. In addition, Amihud and Lev (1981) suggest that managers may pursue strategies that reduce risk which in turn lower managerial employment risk.

This study extends the literature by providing additional insight into the relationship between corporate international activity and financial leverage by focusing on the monitoring role of the BOD. Beginning with Jensen and Meckling (1976),

researchers have allocated a great deal of attention to the notion that effective monitoring by the BOD will align the interests of managers and shareholders. The majority of the empirical evidence supports the hypothesis that a strong BOD is associated with corporate strategies that are consistent with the shareholders' interests. Further, it is well documented in the literature that, in making lending arrangements, creditors rely heavily on the firm's audited financial statements (e.g., Daley and Vigeland, 1983; DeFond and Jiambalvo, 1994; and Dichev and Skinner, 2002). In addition, Anderson, Mansi, and Reeb, (2004) argue that, the monitoring ability of the BOD is an important factor that influences the quality of financial statements. Consequently, in this study, we attempt to shed more light on the relationship between global diversification and financial leverage by examining the effect of a variable that previous studies do not account for: the monitoring intensity of the BOD. Accordingly, we posit that the effect of global diversification on the degree of financial leverage is contingent upon the intensity of monitoring activities by the BOD and related committees. In MNCs with vigilant (passive) monitors, there is a positive (negative) relationship between global diversification and financial leverage. Using a sample of 6,188 firm-year observations over the period 2002 through 2006, we find support for this hypothesis.

Chen, Cheng, He, and Kim (1997) suggest that future research on multinational firms' capital structure should control for variables that are not utilized in previous studies. In addition, Doukas and Pantzalis (2003) suggest that more research based on agency theory and corporate governance is needed to explain the effect of internationalization on financial leverage. This paper contributes to the international business literature by showing that the capital structure of globally diversified firms is influenced by the intensity and effectiveness of the firm's BOD in monitoring managers.

The remainder of the study unfolds as follow. Section 2 reviews the literature on the relationship between global diversification and financial leverage and develops the hypothesis. Section 3 describes the data and discusses the research design. Section 4 discusses the empirical findings and robustness checks. Finally, section 5 concludes.

2 Literature review and hypothesis development

There are several theoretical arguments and empirical evidence to support the notion that MNCs should use more financial leverage in their capital structure than do domestic firms. First, because they operate in more than one geographic market, MNCs have multiple sources of capital compared to domestic firms. This advantage should increase debt capacity for MNCs for two reasons. First, as long as financial markets are not perfectly correlated, MNCs may benefit by borrowing

through their foreign subsidiaries located in markets in which the cost of debt (e.g., the interest rate) is lower than that of the domestic market (Denis, Denis, and Yost, 2002). Empirical support for this argument is found in a study by Allayannis, Brown, and Klaper (2003) who observe a strong positive relationship between the difference between LIBOR and local interest rates and the use of foreign debt. Accordingly, the authors suggest that MNCs issue foreign debt to lower their cost of debt. Second, MNCs may lower their overall tax expenses by raising debt capital in foreign markets where they have high income before tax or in foreign markets where the statutory tax rate is higher than that in the local markets (Bodnar, Tang, and Weintrop, 1999). Empirical support for this hypothesis is provided by Newberry and Dhaliwal (2001) who provide evidence that tax incentives impact MNCs decisions regarding the allocation of debt. Based on a sample of international bonds offerings by U.S. MNCs, the authors find that the likelihood a U.S. MNC issues debt through a foreign subsidiary is significantly higher if the statutory tax rate in the foreign market is higher than that in the U.S.

Third, because MNCs derive their income from multiple geographic markets, they are more diversified than purely domestic firms. Accordingly, to the extent that economic activities in these markets are not perfectly correlated, the business and financial risks of MNCs should be lower than those of domestic corporations (Doukas and Pantzalis, 2003). The influence of diversification on MNC total risk was discussed in earlier studies in international finance. For example, a study by Hughes, Logue, and Sweeney (1975) compares total risk (measured as the standard deviation of return on equity) of 46 MNCs with that of 100 domestic firms and reports that MNCs are less risky than domestic firms. In a comparable study, Agmon and Lessard (1977) argue that barriers to portfolio capital flows limit the ability of investors to diversify internationally and this creates value for the MNC. Furthermore, they find that the degree of internationalization is associated with lower market-assigned measures of systematic risk. Similarly, the findings of Fatemi (1984) reveal a negative relationship between the degree of foreign involvement and firm risk. Shaked (1986) compares 58 MNCs with 43 domestic corporations in terms of the average standard deviation of equity, the average systematic risk, and the mean insolvency-probability among other variables. He finds that, compared to domestic firms, MNCs have a lower average standard deviation of equity, lower average systematic risk, and lower mean insolvency probability. These findings suggest that MNCs are less risky than domestic firms. In two back to back studies, Reeb and Mansi (2001) and Reeb and Mansi (2002), examine the impact of corporate international diversification on the cost of debt capital. In the first study, the authors examine the association between internationalization and firm

credit rating. They find that the firm credit rating is positively influenced by the degree of internationalization. The results of the second study reveal that there is a negative relationship between the degree of internationalization and the cost of debt. Specifically, the authors find that internationalization reduces the cost of debt by 13% on average.

There are equally plausible reasons to believe that MNCs should use less debt. First, consider the influence of internationalization on firm risk. While, based on the implications of portfolio theory, diversifying among several un-perfectly correlated markets should decrease business and financial risk, international diversification exposes the firm to additional types of risk which may work to decrease a firm's debt capacity. Two examples of these risks that arise as a result of international involvement are foreign exchange risk and political risk. Foreign exchange risk increases the volatility (instability) of foreign cash flow and makes it more difficult to estimate the MNCs overall income. Several empirical studies show an impact of exchange rate risk on stock price volatility of multinational firms and also on their cost of capital (e.g., Bartov, Bodnar, and Kaul 1996; He and Ng, 1998). Political risk refers to the risk that a multinational corporation's foreign assets and/or earnings will be confiscated by the local government. According to Reeb, Kwok, and Baek (1998), this type of risk (which is a direct function of the firm's degree of internationalization) significantly affects the systematic risk of the firm. Thus, the benefits of diversification in reducing total firm risk may be offset by the exposure to exchange and political risks.

Another reason why MNCs may use less debt is related to the type of assets (tangible vs. intangible) they own. Capital structure theory implies that financial leverage is negatively affected by the intensity of the firm's intangible assets (e.g., the ratio of intangible assets to total assets) (Harris and Raviv, 1990). The logic underlying the proposed negative relationship between intangible assets and financial leverage is related to the value of intangible assets. Because it is difficult for lenders to effectively estimate the value of intangible assets, they are less willing to invest in firms where the ratio of intangible assets to tangible assets is high. However, internalization theory suggests that a motive for pursuing global diversification is to exploit firm specific advantage measured as investments in intangible assets (Caves, 1971). Further, MNCs may highly invest in intangible assets to lower the effect of political risk (Burgman, 1996). Therefore, it is expected that a significant fraction of the MNC's assets will consist of intangible assets and, other things being equal, this may lower the MNC's ability to invest in debt. Third, MNCs may use less debt because they have higher agency costs of debt (Lee and Kwok, 1988; Burgman, 1996). A tenet of capital structure theory is known as the "asset substitution effect" which results from the agency cost of debt

(Jensen and Mekling, 1976). According to this view, debt creates conflicts of interest between shareholders and bondholders because debt may motivate shareholders to invest in risky projects even if these projects decrease value (Harris and Raviv, 1990). When shareholders use debt to finance a firm's investments, most of the positive returns above the face value of debt will be earned by shareholders. Conversely, because of the limited liability feature of a corporation, when investments fail, bondholders suffer the consequences. Aware of the adverse effect of the asset substitution problem on their investment, bondholders demand a higher interest rate when they suspect such a problem. In addition, bondholders may require the issuance of bond covenants in order to restrict the firm's future investments. In this situation, it becomes costly and/or inconvenient for a firm to use debt. Therefore, Jensen and Mekling (1976), argue that firms which are exposed to a high degree of agency cost of debt (e.g., asset substitution effect) use less debt. Agency cost of debt is influenced by the complexity of a firm's operations (Lee and Kwok, 1988). Most large MNCs operate in multiple foreign markets and, therefore, are exposed to different languages and varying accounting and legal systems. Hence, it is expected that MNCs face higher monitoring costs and this decreases their debt capacity (Burgman, 1996). Based on the above theoretical arguments few empirical studies examine the relationship between internationalization and financial leverage. To begin with, Lee and Kwok (1988) compare domestic corporations with MNCs in terms of agency cost of debt, bankruptcy costs, and financial leverage. Specifically, based on notions that MNCs are more complex than domestic firms and global diversification reduces firm risk, Lee and Kwok hypothesize that MNCs have higher agency cost of debt but lower bankruptcy costs. Using a sample of 644 MNCs and 421 domestic corporations, Lee and Kwok find support for the hypothesis that MNCs have higher agency cost of debt. For the second hypothesis, the results show that MNCs have lower bankruptcy costs than do domestic firms. However, when size is controlled for, the results show no difference between domestic and multinational firms in terms of bankruptcy costs. Consequently, Lee and Kwok conclude that size and not global diversification what is causing a reduction in bankruptcy costs. Next, the authors compare domestic and multinational firms in terms of capital structure. They find that domestic corporations are more leveraged than MNCs.

In a similar study to that of Lee and Kwok, Fatemi (1988) compares the financing policy of 84 U.S. based MNCs with that of 52 U.S. based domestic corporations. To avoid measurement bias, Fatemi uses six different proxies for financial leverage. Results support the hypothesis that U.S. based MNCs have smaller financial leverage ratios than do U.S. based domestic corporations. Fatemi suggests that factors such as higher agency and bankruptcy costs,

currency risk, and the existence of non-interest tax shields explain the difference in financial leverage between domestic and multinational U.S. corporations. More recently, Burgman (1996) finds that due to factors such as political and exchange risk and high agency cost of debt, MNCs have a lower financial leverage ratio (measured as debt to equity) than do domestic corporations. In addition, Chen, Cheng, He, and Kim (1997), directly examine the relationship between internationalization and financial leverage and also compare the capital structure of domestic and multinational corporations. They report somewhat puzzling results. Specifically, they find that internationalization is positively related to financial leverage. However, after controlling for firm size, bankruptcy costs, growth opportunities, and profitability, the results reveal that domestic corporations have a higher debt ratio than do MNCs. Accordingly, Chen, Cheng, He, and Kim suggest that further research is needed to examine the relationship between internationalization and financial leverage.

The results of the above studies reveal that domestic corporations utilize higher debt ratios than do MNCs. However, the findings of recent studies by Kwok and Reeb (2000), Reeb and Mansi (2002) and Allayannis, Brown, and Klaper (2003) indicate that the relationship between internationalization and financial leverage is positive or at least is non-monotonic which implies that other variables moderate this relationship. Specifically, Kwok and Reeb find that MNCs home/target markets moderate the relationship between internationalization and financial leverage. For example, the relationship between internationalization and financial leverage is positive (negative) when a corporation from a less developed market (more developed market) invests in a more developed (less developed market). In addition, Reeb and Mansi (2002) find that the relationship between internationalization and financial leverage is curvilinear. At low levels of internationalization, there is a negative association between internationalization and debt. However, at higher levels of internationalization, there is a positive association between internationalization and debt.

The few capital structure studies examining the impact of internationalization on financial leverage and comparing MNCs to domestic corporations are based on agency costs of debt, bankruptcy costs as they relate to international investment risks, and the benefits of diversification. While we do not deny the importance of any of these factors, we believe that other factors that influence the firm's capital structure (such as the board of director's independence and efficiency) are too important to be neglected when examining the relationship between the firm's diversification strategies and degree of financial leverage.

An implication of agency theory is that the BOD serves to protect the interests of shareholders from the self-serving decisions of managers (Jensen and

Meckling, 1976). Accordingly, an essential task performed by the BOD is monitoring the firm's top managers (Fama and Jensen, 1983). Through its monitoring authority, the board can affect bond holders' value by verifying the investment decisions of managers to assure that the intent behind these decisions is to maximize creditor's value.

Klein (2002) argues that the ability of the BOD to successfully monitor the firm's CEO is influenced not only by the effectiveness and independence of the board as a whole, but also by the effectiveness and independence of its committees (e.g., audit and compensation committees). Anderson, Mansi, and Reeb (2004) suggest that the audit committee is an important variable that must be considered when evaluating the relationship between corporate governance and cost of debt. Empirically, Krishnan (2005) finds that the quality of the audit committee is associated with the quality of the firm's internal control.

Strong corporate governance (e.g., an efficient and independent BOD and its committees) can influence the degree of the firm's financial leverage in at least two ways. First, the BOD and its committees monitor the financing decisions of managers to assure that the intent behind these decisions is to maximize shareholder value. Specifically, effective monitoring by the BOD may discourage risk averse managers to pursue their agenda and lowering debt below the optimal level. In line with this argument, several studies document a positive relationship between effective monitoring by the BOD and the degree of risk enhancing corporate strategies (e.g., Zantout and O'Reilly-Allen, 1996; Ellstrand, Tihanyi, and Johnson, 2002; Cheng, 2004).

Second, effective monitoring by the BOD and its committees influences the degree of financial leverage through their impact on the firm's cost of debt capital and its credit rating. Because creditors rely on financial statements to assess a firm's compliance with debt covenants and also to determine lending agreements (e.g., Daley and Vigeland, 1983; DeFond and Jiambalvo, 1994), the firm's credit rating and cost of debt are influenced by the quality of the firm's financial statements. Accordingly, because a major function of the board is to supervise the firm's financial reporting process (Klein, 2002), there is a relationship between the characteristics of the BOD and cost of debt. The findings of recent studies by Anderson, Mansi, and Reeb (2004) and Ashbaugh-Skaife, Collins, and LaFond (2006) find support for these relationships. Specifically, the two studies report that BOD's independence and effectiveness significantly affect the firm's credit rating and cost of debt financing.

Based on the discussion above, we develop the following hypothesis:

H1: The relationship between global diversification and financial leverage is influenced by the monitoring efficiency of the BOD and audit committee; efficient monitoring is associated with more debt while an inefficient monitoring is associated with less debt.

3 Data, research design, and sample

3.1 Measures of monitoring efficiency

In the literature, the efficiency (quality) of monitoring by the BOD and audit committee is a function of (1) board independence, (2) the number of busy directors on the board, (3) board and related committees sizes, and (4) the number of board meetings. We proxy for board independence using two measures: (1) whether the CEO is also the chairman of the board (DUALITY) and (2) the percentage of outside directors on the board (OUT%). We measure CEO/chair duality as a dummy variable which equals to one if the same person occupies the positions of CEO and chairman of the board, zero otherwise. For the second measure, we divide the number of outside directors by the total number of directors on the board. Similar to Rosenstein and Wyatt (1990), we classify outside directors as those who are associated with the firm only through their directorships. We proxy for busy directors on the board using two measures: (BUSYD1) is the number of directors on the board who serve on four or more boards and (BUSYD2) is the number of directors who are CEOs of other firms. We measure board size (BODS) and audit committee size (AUDITS) as the total members serving on the BOD and audit committee. Finally, we measure board meetings (BODM) as the total number of meetings a board has during a year.

3.2 Measures of global diversification

Errunza and Senbet (1984) maintain that no one measure captures the total degree of global diversification. Consequently, we use several measures to proxy for international diversification. First, we use a dummy variable (GD) to measure global diversification consistent with prior research (Denis, Denis, and Yost (2002) and Bodnar, Tang, and Weintrop (1999). A firms is classified as globally diversified if it has any foreign sales and one business segment. However, this measurement method may overstate the number of multinational firms in the sample and consequently bias the results. Therefore, a sensitivity analysis was performed by using two measures global diversification: 1) a firm is classified as globally diversified if both foreign sales ratio and foreign assets ratio are greater than 10% (GD1). 2) If a firm has either a foreign sales ratio or a foreign assets ratio greater than 10% (GD2). Consistent with prior research Errunza and Senbet (1981 and 1984), foreign sales ratio (FSR) equals foreign sales divided by total assets. Foreign assets ratio (FAR) equals to foreign assets divided by total assets.

3.3 Measures of financial leverage

We follow previous empirical research on the relationship between diversification and financial leverage (e.g., Mansi and Reeb, 2002; Low and Chen, 2004) and use the total debt / total assets ratio as a measure of financial leverage.

3.4 Measures of control variables

Prior empirical research on the relationship between diversification and financial leverage (e.g., Kwok and Reeb, 2000; Low and Chen, 2004) reveal that leverage is influenced by the following variables:

- Firm Size (SIZE) measured as market value of total capital
- Firm profitability (PROF) measured as income before extraordinary items divided by sales
- Intangible assets (advertising and research and development (R&D)) measured as the ratio of R&D/sales (R&D) and advertising/sales (ADV)
- Market-to-book ratio (MB). We follow Byoun (2008) and calculate the market value of assets as total assets (Compustat #6) less total equity (Compustat #216) less any deferred tax and investment tax credit (Compustat #35) plus the market value of the firm's common equity (share price at the end of the fiscal year (Compustat #199) multiplied by the number of shares outstanding (Compustat #54)) plus preferred stock liquidating value (Compustat #10) when available and the redemption value of preferred stock (Compustat #56) otherwise.

- Depreciation expense (DEP) measured as depreciation and amortization (Compustat #14) deflated by total assets.

3.5 Research design

In testing the hypothesis, we analyzed panel data using fixed effects regressions because the fixed effects approach is robust in the presence of omitted firm-specific variables (Gujarati, 2003). The existence of omitted variables causes the estimates of OLS to be biased. In addition, unlike testing cross sectional models, analyzing panel data using fixed effects lessens the impact of multicollinearity because it creates more variance by combining variance across firms and variance over time (Kennedy, 2003). Specifically, we estimate the following model:

$$LEV_{it} = \alpha_1 + \beta_1 GD_{it} + \beta_2 MON_{it} + \beta_3 GD_{it}*MON_{it} + \beta_4 SIZE_{it} + \beta_5 R\&D_{it} + \beta_6 ADV_{it} + B_7 DEP_{it} + \beta_8 MB_{it} + \beta_9 PROF_{it} + \varepsilon_{it} \tag{1}$$

Where *LEV* denotes the degree of financial leverage. *GD* denotes one of the global diversification measures. *MON* denotes monitoring efficiency as explained in section 3(a). *PROF* denotes profitability of the firm. *SIZE* denotes firm size. *R&D* and *ADV* denote research and development and advertising intensity, respectively. *MB* denotes market to book ratio. Finally *DEP* denotes total depreciation expense. All other variables are discussed in subsection 3.4.

3.6 Sample

The sample extends over a period of 5 years from 2002 to 2006. The data come from three resources: Compustat, CRSP, and the Corporate Library. In addition, we used the Securities and Exchange Commission webpage (www.sec.gov) to obtain firms' missing financial information. In selecting the firms for the final sample, we performed the following steps:

1) Obtained all firms with information on the Compustat Segment File

2) Because agency problems are more severe in large firms (Cheng, 2004), and to be consistent with previous studies on the consequences of diversification, we eliminated small firms with sales less than $20M (e.g., Denis, Denis, and Yost, 2002)

3) Then we eliminated financial firms (SIC 6000-6999) from the sample because financial firms are regulated and, as a result, may experience agency problems that are different from those faced by unregulated firms (Denis, Denis, and Youst, 2002). In addition, we eliminated firms that have any financial segments.

4) To be consistent with other studies (e.g., Denis, Denis, and Yost, 2002; Bodnar, Tang, and Weintrop, 1999), we eliminated foreign firms (Compustat FINC other than 0)

5) Firms that do not have information about their geographic segments were eliminated. In addition, we eliminated firms for which their total sales for either geographic or business segments do not fall within 1% of total sales (Denis, Denis, and Yost, 2002)

These steps yielded an unbalanced panel data set containing 2,138 different firms with 6,188 firm-year observations.

4 Empirical results

This section is divided into three subsections. First, subsection 4.1 provides descriptive statistics for the main variables in the study. Subsection 4.2 presents the results of the hypotheses. Finally, subsection 4.3 presents robustness checks.

4.1 Descriptive statistics

Table 1 shows the mean, median and standard deviation values for the key variables in the study. The degree of financial leverage for the average firm in the sample is 0.47. The highest (lowest) degree of financial leverage for the firms in the sample equals

0.62 (0.00). With respect to corporate governance variables for the firms in the sample, the average number of directors serving on four or more boards *(BUSYD1)* is close to one. The maximum (minimum) number of directors serving on four or more boards is nine (zero) directors. In terms of the number of directors who are CEOs of other firms *(BUSYD2)*, the average firm in the sample has 2.43 directors. In addition, the maximum (minimum) number of directors who are CEOs of other firms is nine (zero) directors. The average board size *(BODS)* for the firms in the sample is 8.81 directors. Firms with the largest boards have 19 directors and firms with the smallest boards have only four directors. The number of board meetings *(BODM)* varies widely across the sample from only one annual meeting to as many as 39 annual meetings with average annual board meetings equal to 7.13 times. There is also substantial variability in audit committee size *(AUDITS)*. Firms with the largest audit committees have 10 members on each committee and firms with the smallest audit committee have only one member. On average, firms have 3.64 members serving on the audit committees.

4.2 Multivariate results

The hypothesis in this study predicts that monitoring by the BOD and audit committee influence the relationship between global diversification and the degree of financial leverage. We estimate seven models to examine the effect of board independence, board busyness, board/committee size, and board annual meetings on the degree of financial leverage outcome of global diversification. Table 2 presents the regression estimates of these models. As mentioned in section 3(b), we follow Denis, Denis, and Yost (2002) and Bodnar, Tang, and Weintrop (1999) and proxy for global diversification as a dummy variable equal 1 if the firm has one segment and either a foreign assets or foreign sales ratio greater than 0, zero otherwise.

The board's monitoring efficiency can be improved if CEO's power is limited (Yermack, 1996). Jensen recommends that "… for the board to be effective, it is important to separate the CEO and chairman positions." (1993, p.866). Accordingly, we predict that CEO duality negatively (moderates) the relationship between global diversification and financial leverage. Model 1 of Table 2 shows the results of this prediction. The coefficient on the interaction term DUALITY*GD1 is negative (-0.03) but is not significant at a conventional level.

Agency scholars (e.g., Byard, Li, and Weintrop, 2006) suggest that appointing outside directors on the board is another aspect that enhances the board's independency and, as a result, increases its directors' ability and willingness to monitor management's financing decisions. Empirically, Anderson, Mansi, and Reeb (2004) find that the percentage of outsiders on the BOD is negatively related to the cost of debt.

The authors conclude that, when making investment decisions, bondholders strongly assess the ability of the board to exercise effective monitoring of the firm's top managers. Model 2 of Table1 shows the impact of the outside directors on the relationship between global diversification and financial leverage. Consistent with argument of Byard, Li, and Weintrop (2006) and the results of Anderson, Mansi, and Reeb (2004), the findings reveal that the ratio of outside directors on the board positively moderates the relationship between global diversification and financial leverage. Specifically, the coefficient on the interaction term OUT%*GD1 is positive (0.07) and statistically significant at the 5% level.

Theoretical arguments and the findings of several empirical studies suggest that busy directors are less able to exert sufficient effort in monitoring the firm's top executives which adversely impacts firm performance. Specifically, Beasley (1996) finds that the likelihood of committing financial statements fraud increases with the number of busy outside directors serving on the firm's board. In addition, Core, Holthausen, and Larker (1999) report that high levels of CEO compensations are positively associated with the number of busy directors serving on the board. More recently, Fich and Shivdasani (2006) document an inverse relationship between the number of directors serving on three or more boards and firm performance measured as the ratio of market to book value. Based on these findings, we predict negative relationships between the number of directors serving on more than 4 boards and the degree of financial leverage attributable to global diversification. We proxy for busy boards using two measures 1) BUSYD1 is the number of directors serving on four or more boards (Model 3) and BUSYD2 is the number of directors who are CEO of other firms (Model 4). Table 2 also shows the results of Models 3 and 4. Specifically, the findings indicate that the interaction terms *(BUSYD1*GD1* and *BUSYD2*GD1)* are negative (both equal -0.02) but only the coefficient on the interaction term *BUSYD1*GD1* is significant at a conventional level (10%).

Research in agency theory suggests that board size affects the directors' ability to control and monitor managers. Empirically, Yermack (1996) finds a negative relationship between board size and firm performance (Tobin's Q). In addition, Yermack finds that the relationship between CEO compensation and firm performance is stronger in firms with small boards. The results of Model 5, presented in Table 2, are consistent with theory: the coefficient on the interaction term BODS*GD1 is negative (-0.02) and significant at the 10% level.

Table 1. Descriptive statistics (Sample size= 6188)

Dependent and Independent Variables of Interest	Mean	Median	Std. Dev.	Min	Max
Financial Leverage (LEV)	0.47	0.39	0.35	0,00	0.62
CEO/Chairman of the Board (DUALITY)	0.65	1.00	0.48	0.00	1.00
Outsiders Percentage on the Board (OUT%)	0.81	0.85	0.09	0.33	1.00
Global Diversification Dummy1 (GD1)	0.09	0.00	0.29	0.00	1.00
Global Diversification Dummy2 (GD2)	0.52	1.00	0.50	0.00	1.00
Directors Serving on Four or more Boards (BUSYD1)	1.01	1.00	1.22	0.00	9.00
Directors CEOs (BUSYD2)	2.43	2.00	1.27	0.00	9.00
Board of Directors' Size (BODS)	8.81	9.00	2.15	4.00	19.00
Board of Directors Meetings (BODM)	7.13	7.00	4.80	1.00	39.00
Audit Committee Size (AUDITS)	3.64	3.00	1.08	1.00	10.00
Foreign Sales Ratio (FSR)	0.37	0.36	0.24	0.00	1.00
Foreign Assets Ratio (FAR)	0.30	0.26	0.21	0.00	1.00

Note: variable definitions:

LEV: is the degree of financial leverage measured as total debt / total assets.

DUALITY: is a dummy variable equals 1 if the CEO is also the chairman of the board, zero otherwise.

OUT%: is the percentage of outside directors on the board measured as the number of outside directors on the board divided by the total number of directors. Outside directors defined as those who are not currently employed by the firm, have not been employed by the firm, and are not related to current management.

GD1: is a dummy variable equals 1 if the firm has either a foreign assets ratio or a foreign sales ratio greater than 0, zero otherwise.

GD2: is a dummy variable equals 1 if the firm has either a foreign assets ratio or a foreign sales ratio greater than 10%, zero otherwise.

BUSYD1: is a proxy of busy boards measured as the number of directors serving on four or more boards.

BUSYD2: is a proxy of busy boards measured as the number of directors who are CEO of other firms.

BODS: is board size measured as the number of directors serving on the board.

BODM: is board meetings measured as the number of annual board meetings.

AUDITS: is audit committee size measured as the number of members of the audit committee.

FAR: is foreign assets ratio measured as foreign assets divided by total assets.

FSR: is foreign sales ratio measured as foreign sales divided by total sales.

Table 2. Fixed effects regression model results for the moderating impact of corporate governance on the relationship between global diversification and degree of financial leverage using a sample of firms over the period from 2002 to 2006

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	-1.34***	-1.35***	-1.35***	-1.36***	-1.35***	-1.34***	-1.35***
SIZE	0.42***	0.41***	0.42***	0.43***	0.42***	0.42***	0.42***
ADV	-1.14**	-1.13**	-1.13**	-1.15**	-1.10**	-1.11**	-1.18**
R&D	-0.38**	-0.37**	-0.38**	-0.37**	-0.38**	-0.38**	-0.37**
MB	-0.06	-0.05	-0.06	-0.09	-0.08	-0.07	-0.04
DEP	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PROF	0.19***	0.19***	0.19***	0.19***	0.19***	0.20***	0.19***
GD1	0.03	0.05	0.06	0.05	0.04	0.05	0.04
DUALITY	-0.00*	-	-	-	-	-	-
OUT%	-	0.03**	-	-	-	-	-
BUSYD1	-	-	-0.01**	-	-	-	-
BUSYD2	-	-	-	-0.01	-	-	-
BODS	-	-	-	-	-0.04*	-	-
AUDITS	-	-	-	-	-	0.01*	-
BODM	-	-	-	-	-	-	0.01
*DUALITY*GD1*	-0.03	-	-	-	-	-	-
*OUT%*GD1*	-	0.07**	-	-	-	-	-
*BUSYD1*GD1*	-	-	-0.02*	-	-	-	-
*BYSYD2*GD1*	-	-	-	-0.02	-	-	-
*BODS*GD1*	-	-	-	-	-0.02*	-	-
*AUDITS*GD1*	-	-	-	-	-	0.01*	-
*BODM*GD1*	-	-	-	-	-	-	0.01
No. of Obs.	6,188	6,188	6,188	6,188	6,188	6,188	6,188
Adj. R²	0.60	0.60	0.60	0.60	0.60	0.60	0.60

Notes: $*$, $**$ and $***$ denote significance at the 10%, 5% and 1% levels respectively. Year and firm dummy variables are included in the regression models; however, their coefficients are not reported in Table 2.

Variable definitions:

SIZE: is firm size measured as the natural logarithm of total assets.

ADV: is advertising intensity measured as advertising divided by sales.

R&D: is research and development intensity measured as research and development divided by sales.

MB: is Market-to-book ratio. Measured as the market value of assets as total assets (Compustat #6) less total equity (Compustat #216) less any deferred tax and investment tax credit (Compustat #35) plus the market value of the firm's common equity (share price at the end of the fiscal year (Compustat #199) multiplied by the number of shares outstanding (Compustat #54)) plus preferred stock liquidating value (Compustat #10 when available and the redemption value of preferred stock (Compustat #56) otherwise)

DEP: is depreciation measured as depreciation and amortization (Compustat # 14) deflated by total assets (Compustat #6).

PROF: is firm profitability measured as operating income deflated by total assets.

See Table 1 for the definitions of the remaining variables.

This study suggests that the audit committee influences the relationship between global diversification and financial leverage through its role in maintaining proper disclosure of the firm's financing decisions. Several empirical studies document a positive effect of disclosure and accounting information quality on firm value. For example, using a sample of U.S. firms, Bens and Monahan (2004) document that high disclosure quality is positively associated with excess value of diversification. Similarly, Hope and Thomas (2008) find that international firms that voluntarily disclose earnings by geographic area, experience higher firm value. Because a major function of the audit committee is to establish and maintain the accounting process of the firm (Chen and Zhou, 2007) audit committees with sufficient resources (measured by size) would better serve bondholders by assuring that managers' financing decisions are adequately disclosed. The results of Model 6, presented in Table 2, are consistent with this prediction. The coefficient on the interaction term *AUDITS*GD1* is positive (0.01) and significant at the 10% level.

There are two opposite views regarding the impact of the number of times the board meets on firm financial leverage. One view is that the more frequently board members meet, the better they become in monitoring managers and in designing long term planning that maximizes bondholder value. For instance, Conger, Finegold, and Lawler (1998) explain that meeting time is an important variable that is positively related to the directors' ability to monitor managers.

An opposing view is that greater meeting frequency signals poor performance. For example, Jensen (1993) suggests that board annual meetings increase only in the presence of severe problems. Consistent with this argument, Vafeas (1999) finds inverse relationship between the number of board annual meetings and the firm's stock price. Based on these arguments, the relationship between the board meeting frequency and firm performance and financial leverage is an open research question. The results of Model 7, presented in Table 2, reveal that the frequency of board meeting does not affect the relationship between global diversification and the degree of financial leverage.

To summarize, the findings in Table 2 provide partial support for the hypothesis that monitoring by the BOD and audit committee moderates the relationship between global diversification and financial leverage. Specifically, 4 out of the 7 variables (used to measure monitoring efficiency) are statistically significant at 10% or less.

4.3 Robustness checks

In the previous analysis, we followed Denis, Denis, and Youst (2002) and classified a firm as globally diversified if has any foreign sales or foreign assets.

Doukas and Kan (2006) criticized this method because it tends to overstate the number of globally diversified firms in the sample. To assure that my results are not sensitive to the classification method of globally diversified firms, we measure global diversification using three additional measures. First, we classify a firm as globally diversified *(GD2)* if it has either a foreign assets ratio or a foreign sales ratio greater than 10%. Table 3 presents estimates of the moderating impact of monitoring intensity on the relationship between global diversification *(GD2)* and financial leverage. Similar to the results obtained from Table 2, the results in Table 3 indicate that the relationship between global diversification and financial leverage is moderated by 1) the ratio of outside directors on the board (positively), 2) busy boards (negatively), 3) board size (negatively), and 4) the audit committee size (positively). Further, the results in Table 3 show CEO duality has a negative impact on the relationship between global diversification (GD2) and financial leverage. Consistent with the results in Table 2, there is no statistically significant impact of the number of CEO serving on the board or the frequency of board meetings on the relationship between global diversification and financial leverage.

Finally, following Errunza and Senbet, 1984, we use two other measures to proxy for global diversification: Foreign sales ratio (Table 4) and foreign assets ratio (Table 5). Other than the impact of board size, the results in tables 4 and 5 are very similar to those in Table 3.

5 Summary, limitations, and extensions

Prior research examining the relationship between global diversification and the degree of financial leverage has produced mixed results. This indicates that this relationship is influenced by other variables and, therefore, in order to understand the true impact of global diversification on financial leverage, a researcher must account for these variables which prior research does not control for.

Thus, the purpose of this study is to identify firm attributes that influence the relationship between global diversification and the degree of financial leverage. It is well documented in the literature that managers prefer to utilize less debt because 1) debt is risky and this would increase the probability of bankruptcy and loss of employment and 2) debt creates additional monitoring of managers' decisions with related possible actions by bondholders. However, as mentioned above, efficient monitoring by the BOD, audit committee, and/or shareholders would discourage self-serving managers from lowering financial leverage below its optimal level. Accordingly, we suggest that a strong corporate governance system increases the degree of financial leverage among globally diversified firms.

Table 3. Fixed effects regression model results for the moderating impact of corporate governance on the relationship between global diversification and degree of financial leverage using a sample of firms over the period from 2002 to 2006

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	-1.38***	-1.37***	-1.35***	-1.34***	-1.39***	-1.33***	-1.35***
SIZE	0.42***	0.42***	0.42***	0.42***	0.42***	0.41***	0.42***
ADV	-1.15**	-1.12**	-1.14**	-1.10**	-1.12**	-1.14**	-1.12**
R&D	-0.38**	-0.37**	-0.36**	-0.37**	-0.38**	-0.38**	-0.37**
MB	-0.06	-0.04	-0.06	-0.06	-0.05	-0.06	-0.03
DEP	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PROF	0.19***	0.19***	0.19***	0.19***	0.20***	0.20***	0.19***
GD2	0.02	0.03	0.02	0.01	0.01	0.02	0.02
DUALITY	-0.00*	-	-	-	-	-	-
OUT%	-	0.02**	-	-	-	-	-
BUSYD1	-	-	-0.01**	-	-	-	-
BUSYD2	-	-	-	-0.02	-	-	-
BODS	-	-	-	-	-0.01*	-	-
AUDITS	-	-	-	-	-	0.00*	-
BODM	-	-	-	-	-	-	0.02
*DUALITY*GD2*	-0.06**	-	-	-	-	-	-
*OUT%*GD2*	-	0.04**	-	-	-	-	-
*BUSYD1*GD2*	-	-	-0.02*	-	-	-	-
*BYSYD2*GD2*	-	-	-	-0.01	-	-	-
*BODS*GD2*	-	-	-	-	-0.04*	-	-
*AUDITS*GD2*	-	-	-	-	-	0.04**	-
*BODM*GD2*	-	-	-	-	-	-	0.00
No. of Obs.	6,188	6,188	6,188	6,188	6,188	6,188	6,188
Adj. R²	.60	.60	.60	.60	.60	.60	.60

Notes∗, ∗∗ and ∗∗∗ denote significance at the 10%, 5% and 1% levels respectively.

See Tables 1 and 2 for variable definitions.

Year and firm dummy variables are included in the regression models; however, their coefficients are not reported in Table 3.

Table 4. Fixed effects regression model results for the moderating impact of corporate governance on the relationship between global diversification and degree of financial leverage using a sample of firms over the period from 2002 to 2006

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	-1.70***	-1.75***	-1.66***	-1.78***	-1.69***	-1.66***	-1.64***
SIZE	0.50***	0.50***	0.50***	0.51***	0.49***	0.49***	0.49***
ADV	-1.42***	-1.40***	-1.39**	-1.32***	-1.36***	-1.39***	-1.35***
R&D	-0.57*	-0.57*	-0.55*	-0.57*	-0.57*	-0.59*	-0.57*
MB	-0.79***	-0.77***	-0.78**	-0.77**	-0.72**	-0.79***	-0.78***
DEP	0.06	0.06	0.07	0.06	0.06	0.07	0.07
PROF	0.14**	0.14**	0.15**	0.15**	0.15*	0.15***	0.14**
FSR	0.03	0.06	0.09	0.11	0.10	0.09	0.11
DUALITY	-0.00	-	-	-	-	-	-
OUT%	-	0.08**	-	-	-	-	-
BUSYD1	-	-	-0.01*	-	-	-	-
BUSYD2	-	-	-	-0.01	-	-	-
BODS	-	-	-	-	-0.01	-	-
AUDITS	-	-	-	-	-	0.01*	-
BODM	-	-	-	-	-	-	0.00
*DUALITY*FSR*	-0.03*	-	-	-	-	-	-
*OUT%*FSR*	-	0.19***	-	-	-	-	-
*BUSYD1*FSR*	-	-	-0.02*	-	-	-	-
*BYSYD2*FSR*	-	-	-	-0.01	-	-	-
*BODS*FSR*	-	-	-	-	-0.01	-	-
*AUDITS*FSR*	-	-	-	-	-	0.06**	-
*BODM*FSR*	-	-	-	-	-	-	0.01
No. of Obs.	6,188	6,188	6,188	6,188	6,188	6,188	6,188
Adj. R²	.60	.60	.60	.60	.60	.60	.60

Notes: ∗, ∗∗ and ∗∗∗ denote significance at the 10%, 5% and 1% levels respectively.

See Tables 1 and 2 for variable definitions.

Year and firm dummy variables are included in the regression models; however, their coefficients are not reported in Table 4.

Table 5. Fixed effects regression model results for the moderating impact of corporate governance on the relationship between global diversification and degree of financial leverage using a sample of firms over the period from 2002 to 2006

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	-1.52***	-1.50***	-1.58***	-1.74***	-1.43***	-1.50***	-1.38***
SIZE	0.54***	0.53***	0.55***	0.60***	0.52***	0.47***	0.53***
ADV	-1.33***	-1.35***	-1.39***	-1.44***	-1.41***	-1.25***	-1.45***
R&D	-0.49*	-0.49*	-0.48*	-0.43*	-0.46*	-0.49*	-0.46*
MB	-0.63***	-0.63***	-0.65***	-0.70***	-0.54***	-0.67***	-0.86***
DEP	0.06	0.06	0.06	0.06	0.06	0.06	0.06
PROF	0.15**	0.15**	0.16**	0.16**	0.17**	0.23**	0.11**
FAR	0.08	0.08	0.11	0.08	0.11	0.11	0.11
DUALITY	-0.01	-	-	-	-	-	-
OUT%	-	0.07**	-	-	-	-	-
BUSYD1	-	-	-0.01*	-	-	-	-
BUSYD2	-	-	-	-0.02	-	-	-
BODS	-	-	-	-	-0.02	-	-
AUDITS	-	-	-	-	-	0.03*	-
BODM	-	-	-	-	-	-	0.01
*DUALITY*FAR*	-0.04*	-	-	-	-	-	-
*OUT%*FAR*	-	0.22***	-	-	-	-	-
*BUSYD1*FAR*	-	-	-0.03**	-	-	-	-
*BYSYD2*FAR*	-	-	-	-0.01	-	-	-
*BODS*FAR*	-	-	-	-	-0.02	-	-
*AUDITS*FAR*	-	-	-	-	-	0.08**	-
*BODM*FAR*	-	-	-	-	-	-	0.00
No. of Obs.	6,188	6,188	6,188	6,188	6,188	6,188	6,188
Adj. R²	.61	.61	.60	.60	.61	.61	.61

Notes: ∗, ∗∗ and ∗∗∗ denote significance at the 10%, 5% and 1% levels respectively.
See Tables 1 and 2 for variable definitions.
Year and firm dummy variables are included in the regression models; however, their coefficients are not reported in Table 5.

The results in this study provide some support for the hypothesized relationship. For example, the results show that the relationship between global diversification and financial leverage is moderated by 1) the ratio of outside directors on the board (positively), 2) busy boards (negatively), 3) board size (negatively), and 4) the audit committee size (positively). In terms of the impact of CEO duality, the results are inconsistent. Finally, the impact of the number of CEOs serving on the board and the frequency of board meetings is statistically insignificant.

A limitation of the current study is that it does not directly test the effect of monitoring by the board and audit committee on the cost of debt. Therefore, future research may begin by calculating the cost of debt (e.g., using yield to maturity on a firm's debt (Anderson, Mansi, and Reeb, 2004)) and then examine the impact of information asymmetry on each cost separately.

In addition, to facilitate comparison with prior research and for the lack of available data, this study focuses on U.S. firms only. Research in international business reports that, in general, agency problems are more severe among U.S. firms (e.g., Lee and O'Neil, 2003). Consequently, it would be interesting to first examine the effect of global diversification on firm leverage among non U.S. firms and then determine whether agency problems (resulting from weak corporate governance) influence the relationship between global diversification and financial leverage among non U.S. firms.

Finally, a limitation of this study is that it does not control for managerial and institutional investors' ownership. Most studies examining the relationships between global diversification and financial leverage do not control for managerial and institutional ownership (e.g., Bodnar, Tang, and Weintrop, 1999; Denis, Denis, and Yost, 2002; Bens and Monahan, 2004). However, unlike previous studies, this study attempts to explain the effect of global diversification using the implications of agency theory. Because agency theorists (e.g., Jensen, 1986, 1993) suggest that effective managerial compensation designs and the level of institutional ownership work to align the interests of shareholders and these of managers which may increase financial leverage, we may have obtained different results had we controlled for these two variables. Therefore, an extension of this study would be to collect managerial compensation and institutional ownership data and control for these two variables when examining the effect of global diversification on financial leverage.

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