The Effects of Internationalization on Loan Interest Rates and Debt Ratios of Small and Medium-Sized Enterprises in Taiwan

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ABSTRACT

Many studies have suggested that firm internationalization is associated with a lower cost and a lower level of debt financing. However, several studies provide inconsistent results. This study is motivated by the inconclusive empirical results and the lack of such research on small and medium-sized enterprises (SMEs) in emerging markets. We therefore reinvestigate the effects of internationalization on loan interest rates as well as the relationship between internationalization and debt ratios by focusing on SMEs. Using a panel sample of 1,038 SME year observations in Taiwan from 2001 to 2006, our findings indicate that an SME with a higher degree of internationalization (DOI) does pay lower interest rates on bank loans. The results also indicate that the SME’s debt ratio is inversely related to its DOI, and that the average debt ratio of multinational SMEs is lower than that of domestic SMEs. Our results provide empirical evidence for SMEs in emerging markets and can be compared with those for firms in industrialized economies.

Keywords: Internationalization; Loan interest rates; Debt ratios; Small and medium-sized enterprises.

INTRODUCTION

This study is motivated by the inconclusive results of empirical studies on the effects of internationalization on debt costs and the relationship between internationalization and debt ratios, as well as by the lack of such research that focuses on SMEs in emerging markets. While many studies have suggested that firm internationalization is negatively correlated with the cost of debt financing (Shapiro, 1978; Reeb et al., 2001; Mansi and Reeb, 2002; Singh and Nejadmalayeri, 2004) and is negatively correlated with the level of debt financing (Fatemi, 1988; Lee and Kwok, 1988; Burgman, 1996; Doukas and Pantzalis, 2003), several empirical studies have found that multinational corporations (MNCs) pay higher interest rates on bank loans than purely domestic corporations (DCs) (Burgman, 1996; Armstrong and Riddick, 1998) and have a higher level of debt financing than DCs (Chkir and Cosset, 2001; Reeb et al., 2001; Mansi and Reeb, 2002). As to whether a firm’s internationalization affects its loan interest rates and debt ratios, however, is an empirical issue. To the best of our knowledge, no studies have analyzed this issue directly in the context of small and medium-sized enterprises (SMEs) in emerging markets.

This study aims to reinvestigate the effects of firm internationalization on loan interest rates as well as the relationship between firm internationalization and debt ratios with a focus on SMEs. By using interest rate data on actual bank loans to publicly-listed SMEs in Taiwan, we expect to provide empirical evidence on whether internationalization affects loan interest rates and debt ratios in an emerging market. In this study, the SMEs are selected for the reason that their average firm size is much smaller than that of large firms and thus they need to aggressively expand into international markets to enhance competitive
advantage (Capar and Kotabe, 2003), extend growth opportunities (Kim and Lyn, 1986) and reap the benefits of increased diversification (Reeb et al., 2001).

We run multiple regressions to analyze how internationalization affects the loan interest rates and debt ratios of SMEs in Taiwan, while controlling for other potentially important firm and loan characteristics. Using a panel sample of 186 publicly-listed SMEs with 1,038 annual observations in Taiwan during the period 2001-2006, the empirical results indicate that firms with a higher DOI do pay lower interest rates on bank loans, which are consistent with the findings of most recent studies and may probably be due to the benefits of diversification. However, the empirical results indicate that the firm’s debt ratio is inversely related to its DOI. Furthermore, the empirical results for the subsamples, the multinational SMEs and domestic SMEs, also indicate that the average debt ratios of multinational SMEs are lower than those of domestic SMEs, a finding that is not consistent with those of the most recent studies. At present, the debate is centered on resolving the obvious question: Why do multinational SMEs carry less debt in spite of benefiting from lower costs of debt financing?

International operations are able to bring about benefits and to enhance the firm’s financial performance (Grant, 1987; Tallman and Li, 1996; Hitt et al., 1997; Geringer et al., 2000). However, while Kim and Lyn (1986) suggested that MNCs often have more growth opportunities, Jensen’s (1986) free cash flow hypothesis suggest that an inverse relationship exists between profitable growth opportunities and debt ratios. Thus, our finding that an SME’s debt ratio is inversely related to its DOI may be explained by the theory that multinational SMEs have more growth opportunities than domestic SMEs, which results in a lower level of debt financing. On the other hand, Lee and Kwok (1988) and Doukas and Pantzalis (2003) found that MNCs have higher agency costs of debt and that this results in MNCs seeking less debt financing than DCs. This theory that MNCs have higher agency costs of debt may explain why multinational SMEs are less leveraged than domestic SMEs in our study.

The main contribution of this paper lies in its directly testing whether firm internationalization affects the loan interest rates and debt ratios of SMEs in an emerging market. Our findings provide empirical evidence that a higher DOI leads to lower interest rates on bank loans to the SMEs and results in a lower level of debt financing, implying that multinational SMEs probably have more diversification benefits, more growth opportunities and higher agency costs of debt than domestic SMEs. These results can be compared with those of industrialized economies.

The remainder of this paper is organized as follows. Section 2 presents the theoretical background, discussing the internationalization of SMEs and reviewing the empirical research concerned with the effects of firm internationalization on the cost of debt financing and the level of debt financing. Section 3 describes the data and the methodology used in this study. The descriptive statistics and the results of the regression analysis are presented in Section 4. Finally, Section 5 concludes the paper.

**THEORETICAL BACKGROUND**

**Internationalization of SMEs**

In Taiwan, an SME refers to an enterprise with a paid-in capital not exceeding NT$ 80 million or no more than 200 regular employees, while micro enterprises refer to SMEs with fewer than 5 regular persons. Therefore, the publicly-listed SMEs in our sample are defined as enterprises with between 6 and 200 regular employees or a paid-in capital not exceeding NT$ 80 million. During the last fifty years, Taiwanese SMEs have made great contributions to the economic development of Taiwan.

Internationalization has increasingly become a focus of attention, especially among newly-emerging
economic entities. International operations are able to bring about benefits and to enhance the firm’s financial performance (Grant, 1987; Tallman and Li, 1996; Hitt et al., 1997; Geringer et al., 2000). Thus, many companies aggressively expand into international markets in order to enhance their competitiveness and pursue their market positions.

Sullivan (1994) and Burgman (1996) indicate that there exist no established criteria for measuring the degree of internationalization (DOI). However, owing to the relative ease in obtaining data on foreign sales ratios, many studies have adopted such an approach (Reeb et al., 1998; Singh et al., 2003; Singh and Nejadmalayeri, 2004). Thus, this study will use the percentage of foreign sales to total sales as the proxy variable to measure the firm’s DOI. In this study, the SMEs are selected because their average firm size is much smaller than that of large firms and thus they need to aggressively expand into international markets to enhance their competitive advantage (Capar and Kotabe, 2003), extend their growth opportunities (Kim and Lyn, 1986) and reap the benefits of increased diversification (Reeb et al., 2001).

**Internationalization and the Cost of Debt Financing**

Although several studies have linked the association of firm internationalization with the cost of debt and have suggested that MNCs may face higher degrees of information asymmetry and thus pay higher loan interest rates than DCs (Burgman, 1996; Armstrong and Riddick, 1998), many previous studies have indicated that firm internationalization is negatively correlated with the cost of debt financing (Shapiro, 1978; Reeb et al., 2001; Mansi and Reeb, 2002; Singh and Nejadmalayeri, 2004).

The arguments in favor of a lower cost of debt financing with increased internationalization are based on the firms’ ability to arbitrage segmented capital markets and reduce risk due to having cash flows in imperfectly correlated markets. For example, Shapiro (1978) indicates that these imperfectly correlated cash flows reduce the probability of default and should therefore lead to a lower cost of debt financing. Based on a sample of 2,194 annual observations for U.S. firms, Reeb et al. (2001) find that firm internationalization is negatively related to the cost of debt financing and positively related to credit ratings. Mansi and Reeb (2002) also suggest that internationalization is associated with a lower cost of debt financing. These studies suggest that greater international activity may lower the risks that debt holders face due to the benefits of diversification and thus negatively affect the cost of debt financing.

Therefore, we propose testing Hypothesis 1 as follow:

**H1:** A higher degree of internationalization does cause a lower loan interest rate to the SME.

**Internationalization and the Level of Debt Financing**

Many studies have employed different determinants to relate international diversification to the capital structure of firms. While most recent studies have suggested that firm internationalization is positively correlated with the level of debt financing (Chkir and Cosset, 2001; Reeb et al., 2001; Mansi and Reeb, 2002; Singh and Nejadmalayeri, 2004), many previous studies have found that MNCs have a lower level of debt financing than DCs (Kim and Lyn, 1986; Jensen, 1986; Fatemi, 1988; Lee and Kwok, 1988; Burgman, 1996; Doukas and Pantzalis, 2003). The empirical results are thus not consistent.

Chkir and Cosset (2001) examine the relationship between the debt policy of MNCs and their diversification strategy. They suggest that the debt ratios of MNCs increase with their internationalization. Reeb et al. (2001) suggest that MNCs support a higher level of debt financing. Using a sample of U.S. firms, Mansi and Reeb (2002) also report that international activity is positively associated with higher total and long-term debt ratios; their paper finds that firm internationalization is associated with a 13 percent reduction in the cost of debt and a 30 percent increase in the level of debt financing. Extending
Mansi and Reeb’s work, Singh and Nejadmalayeri (2004) examine the relationship between international diversification, capital structure, and the cost of capital for a sample of French corporations. They suggest that a higher DOI is positively correlated with a higher level of debt financing that directly results in the reduction of the overall—combined debt and equity—cost of capital.

On the contrary, many previous studies suggest that higher DOI may lower the level of debt financing based on the theories that MNCs have more growth opportunities (Kim and Lyn, 1986; Jensen, 1986; Fatemi, 1988; and Burgman 1996) or have higher agency costs of debt than DCs (Lee and Kwok, 1988; Doukas and Pantzalis, 2003). For example, Kim and Lyn (1986) suggest that MNCs often outperform local companies in host countries and have more growth opportunities. In this scenario, MNCs will have a tendency to finance their businesses with equity rather than debt and will thus have lower leverage since the agency costs are positively associated with the firm’s growth opportunities. Jensen’s (1986) free cash flow hypothesis also suggests an inverse relationship between profitable growth opportunities and debt ratios. In line with these arguments, Fatemi (1988) and Burgman (1996) find that MNCs have lower debt ratios than DCs. On the other hand, Lee and Kwok (1988) and Doukas and Pantzalis (2003) indicate that MNCs have higher agency costs of debt than DCs, and hence leading MNCs to seek less debt financing than DCs.

The average firm size of SMEs is much smaller than that of large firms. These SMEs need to aggressively expand into international markets to enhance their competitiveness (Capar and Kotabe, 2003), extend their growth opportunities (Kim and Lyn, 1986) and reap the benefits of increased diversification (Reeb et al., 2001). In the process of internationalization, the SMEs will have more profitable growth opportunities and higher agency costs of debt. As a result, we may infer that the SME’s debt ratio is inversely related to its DOI, and that the average debt ratios of multinational SMEs are lower than those of domestic SMEs. The theory that multinational SMEs have more growth opportunities than domestic SMEs may explain why an SME’s debt ratio is inversely related to its DOI. The theory that MNCs have higher agency costs of debt than DCs may explain why MNCs are less leveraged than DCs. Thus, we propose testing Hypothesis 2 and Hypothesis 3 as follows:

\[ H2: \text{An SME’s debt ratio is inversely related to its degree of internationalization.} \]

\[ H3: \text{The average debt ratio of multinational SMEs is lower than that of domestic SMEs.} \]

**RESEARCH METHODOLOGY**

**Sample and Data Collection**

Our sample includes 186 publicly-listed SMEs with 1,038 annual observations of the last revolving bank loans active at the end of each year during the period 2001-2006. The revolving bank loans are borrowed from the Eight-Largest Banks in Taiwan. All the data needed for the variables used in this study are collected from the Taiwan Economic Journal (TEJ) database, including loan interest rates, debt ratios, foreign sales ratios, total assets, total sales, credit ratings, audit firm size, collateral, and so on. In addition, we use the interest rate for government Treasury securities as the risk-free interest rate in each year of our research period.

In order to examine whether the regression results for multinational SMEs are different from those for domestic SMEs, the overall sample is further divided into two subsamples, with 731 multinational SMEs and 307 domestic SMEs each, respectively, depending upon whether the ratio of foreign sales to total sales is greater than or equal to 10 percent or else less than 10 percent, respectively (Singh and Nejadmalayeri, 2004).
The Empirical Model for Examining the Effects on Loan Interest Rates

In this study, we use two multiple regressions to test the effects of firm internationalization on loan interest rates and examine the relationship between firm internationalization and the level of debt financing for SMEs in Taiwan, while controlling for other potentially important firm and loan characteristics.

The empirical model for examining the effects of firm internationalization on loan interest rates is as follows:

\[
RP_t = \alpha_0 + \alpha_1 FSR_t + \alpha_2 \ln(TA_t) + \alpha_3 CR_t + \alpha_4 AQ_t \text{ Dummy} \\
+ \alpha_5 COL_t \text{ Dummy} + \alpha_6 ICT_t \text{ Dummy} + \varepsilon
\]  

(1)

where \(RP_t\) is the risk premium of bank loans for the firm in year t; \(FSR_t\) is the foreign sales ratio, which is used to proxy for the firm’s DOI; \(\ln(TA_t)\) is the natural log of firm’s total assets at the end of year t, included to control for firm size; \(CR_t\) is the credit rating for the firm in year t, included to control for the firm’s credit risk; \(AQ_t \text{ Dummy}\) is the dummy variable to proxy for audit quality, which equals one for the loans of Big 4 (5) audited firms and zero for the loans of non-Big 4 (5) audited firms, included to control for audit quality; \(COL_t \text{ Dummy}\) is the dummy variable used to control for the effect of collateral on the interest rate; and \(ICT_t \text{ Dummy}\) is the dummy variable used to control for the industry effect of information and communication technology (ICT) firms on the interest rate. A discussion of these variables follows.

Our dependent variable is the risk premium of the bank loan, which is equal to the interest rate for the bank loan minus the risk-free interest rate. The bank loans in our sample are annually renewable revolving credit loans borrowed by the SMEs from the Eight-Largest Banks in Taiwan during the period from 2001 to 2006, and the yearly observation for each firm is the interest rate on its last loan in every sample year.

Many studies have adopted the foreign sales ratio, the percentage of foreign sales to total sales, to measure the degree of firm internationalization (Reeb et al., 1998; Singh et al., 2003; Singh and Nejadmalayeri, 2004). Thus, this study uses the foreign sales ratio as a proxy for the firm’s DOI. Although several empirical studies have suggested that MNCs may face higher degrees of information asymmetry and thus pay higher loan interest rates than DCs, many previous studies have indicated that firm internationalization is negatively correlated with the cost of debt financing (Shapiro, 1978; Reeb et al., 2001; Mansi and Reeb, 2002). If a higher degree of firm internationalization is associated with a lower interest rate, the variable \(FSR_t\) will have a negative coefficient.

To control for firm size, we include the independent variable \(\ln(TA_t)\). We expect interest rates to vary inversely with firm size because loan officers tend to view larger firms as less risky (Sinkey, 1998; Chkir and Cosset, 2001), and because larger firms tend to have better reputations in debt markets (Diamond, 1989). Petersen and Rajan (1994) find a significantly negative relationship between loan interest rates and firm size. Similarly, Blackwell and Winters (1997) also find that loan interest rates are negatively related to both firm size and the frequency of monitoring by loan officers. The logarithmic specification allows for a decreasing marginal effect of firm size on the loan interest rates.

Our credit risk control variable is \(CR_t\), the credit rating for the firm. Credit ratings are commonly used by lenders to measure the firm’s overall level of default risk. We expect the credit rating variable to have a positive coefficient because the credit rating is a principal determinant in the cost of debt capital (Reeb et al., 2001). In Taiwan, a firm’s credit rating is measured by the risk level of the Taiwan Corporate Credit Risk Index (TCRI) obtained from the Taiwan Economic Journal (TEJ) database. By integrating 10 different kinds of financial data, a score representing a rating is obtained that ranges between 1 and 9. The
10 different kinds of financial data are the ROE, ROA, Operating profit ratio, Quick ratio, Interest payout ratio, Debt to equity ratio, Months accounts receivable outstanding, Months sales outstanding, Operating income, and Total assets. The higher the rating level a firm has, the higher its credit risk.

Blackwell et al. (1998) and Pittman and Fortin (2004) suggest that audit assurance is negatively correlated with the cost of debt. Moreover, many empirical studies support the view that audit firm size is positively correlated with audit quality (Teoh and Wong, 1993; Becker et al., 1998; Francis et al., 1999; Abbott et al., 2006). Therefore, we choose audit firm size as a proxy for audit quality and expect that a Big 4 (5) audit will lead to lower loan interest rates. To control for the effect of audit quality on the interest rate, we include a dummy variable \( AQ_t \) \( Dummy \) that equals one for the loans of Big 4 (5) audited firms and zero for the loans of non-Big 4 (5) audited firms. Its coefficient measures the average difference in interest rates between the Big 4 (5) and non-Big 4 (5) audited firms holding other characteristics constant. If the presence of a Big 4 (5) audit is associated with a lower loan interest rate, the variable \( AQ_t \) \( Dummy \) will have a negative coefficient.

To control for the effect of collateral on the interest rate, we include a dummy variable \( COLL_t \) \( Dummy \) that equals one in the presence of collateral and zero otherwise. Previous studies have found collateral to be associated with both higher credit risk and higher interest rates (Berger and Udell, 1990; Blackwell and Winters, 1997). Therefore, we expect this dummy variable to have a positive coefficient.

Furthermore, to control for the industry effect of information and communication technology (ICT) firms on the interest rate, we include a dummy variable \( ICT_t \) \( Dummy \) that equals one for the information and communication technology (ICT) firms and zero otherwise. The ICT industries are developed differently with respect to the capital market and growth. Hyytinen and Pajarinen (2005) attempt to study the financing of technology-intensive small businesses by analyzing their capital structure and find that the leverage ratio of small ICT firms is more conservative than that of other small businesses. Aoun and Heshmati (2008) also show that ICT firms have lower leverage ratios than non-ICT firms. Thus, we expect this dummy variable to have a negative coefficient.

The Empirical Model for Examining the Effects on Debt Ratios

The empirical model for examining the relationship between firm internationalization and the level of debt financing is as follows:

\[
DR_t = \beta_0 + \beta_1 FSR_t + \beta_2 \ln(TA_t) + \beta_3 CR_t + \beta_4 \ln(SALE_t) + \varepsilon
\]

(2)

where \( DR_t \) is the debt ratio for the firm in year \( t \), which is equal to the percentage of total debt to total assets; \( FSR_t \) is the foreign sales ratio, which is used to proxy for the firm’s DOI; \( \ln(TA_t) \) is the natural log of the firm’s total assets at the end of year \( t \), included to control for firm size; \( CR_t \) is the credit rating for the firm in year \( t \), included to control for firm’s credit risk; and \( \ln(SALE_t) \) is the natural logarithm of the total sales for the firm in year \( t \), included to control for the firm’s demand for operating capital.

Most recent studies have suggested that internationalization is positively correlated with the level of debt financing (Chkir and Cosset, 2001; Reeb et al., 2001; Mansi and Reeb, 2002; Singh and Nejadmalayeri, 2004). However, many studies have found that MNCs have a lower level of debt financing than DCs (Fatemi, 1988; Lee and Kwok, 1988; Burgman, 1996; Doukas and Pantzalis, 2003). The empirical results are not consistent. Therefore, if a higher DOI is associated with a higher level of debt financing, the variable \( FSR_t \) will have a positive coefficient. On the contrary, if a higher DOI is associated with a lower level of debt financing, the variable \( FSR_t \) will have a negative coefficient. In addition, we expect \( \ln(TA_t) \) to have a negative coefficient and \( CR_t \) and \( \ln(SALE_t) \) to have negative coefficients.
EMPIRICAL RESULTS

Descriptive Statistics

Table 1 presents descriptive statistics based on the degree of firm internationalization, surrogated by the dichotomous variable multinational SMEs and domestic SMEs. Of the 186 publicly-listed SMEs with 1,038 annual observations in the sample, 70.42 percent are multinational SMEs and 29.58 percent are domestic SMEs.

Table 1: Descriptive Statistics for a Sample of 1,038 Revolving Bank Loans during the Period 2001-2006

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level of Audit Firm Size</th>
<th>Number of Firms</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Median</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basis Points above</td>
<td>Multinational SMEs Sample</td>
<td>731</td>
<td>169</td>
<td>135</td>
<td>-75</td>
<td>129</td>
<td>576</td>
</tr>
<tr>
<td>Risk-free Rate</td>
<td>Domestic SMEs Sample</td>
<td>307</td>
<td>193</td>
<td>125</td>
<td>-1</td>
<td>153</td>
<td>665</td>
</tr>
<tr>
<td>Total Sample</td>
<td></td>
<td>1038</td>
<td>177</td>
<td>133</td>
<td>-75</td>
<td>137</td>
<td>665</td>
</tr>
<tr>
<td>Foreign sales ratio (%)</td>
<td>Multinational SMEs Sample</td>
<td>731</td>
<td>59.47</td>
<td>27.92</td>
<td>10.15</td>
<td>61.72</td>
<td>100.00</td>
</tr>
<tr>
<td>Total Sample</td>
<td>Domestic SMEs Sample</td>
<td>307</td>
<td>1.60</td>
<td>2.79</td>
<td>0.00</td>
<td>0.00</td>
<td>9.80</td>
</tr>
<tr>
<td>Total Sample</td>
<td></td>
<td>1038</td>
<td>42.35</td>
<td>35.34</td>
<td>0.00</td>
<td>39.51</td>
<td>100.00</td>
</tr>
<tr>
<td>Total Assets (NT$000)</td>
<td>Multinational SMEs Sample</td>
<td>731</td>
<td>1205435</td>
<td>86609</td>
<td>161600</td>
<td>968878</td>
<td>766275</td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>Domestic SMEs Sample</td>
<td>307</td>
<td>1491594</td>
<td>1777765</td>
<td>127107</td>
<td>999877</td>
<td>16125172</td>
</tr>
<tr>
<td>Total Sample</td>
<td></td>
<td>1038</td>
<td>1290069</td>
<td>1215569</td>
<td>127107</td>
<td>982960</td>
<td>16125172</td>
</tr>
<tr>
<td>Audit Quality c</td>
<td>Multinational SMEs Sample</td>
<td>731</td>
<td>0.69</td>
<td>0.46</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total Sample</td>
<td>Domestic SMEs Sample</td>
<td>307</td>
<td>0.56</td>
<td>0.49</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total Sample</td>
<td></td>
<td>1038</td>
<td>0.66</td>
<td>0.47</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Collateral d</td>
<td>Multinational SMEs Sample</td>
<td>731</td>
<td>0.50</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total Sample</td>
<td>Domestic SMEs Sample</td>
<td>307</td>
<td>0.53</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total Sample</td>
<td></td>
<td>1038</td>
<td>0.51</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Debt Ratio e</td>
<td>Multinational SMEs Sample</td>
<td>731</td>
<td>44.06</td>
<td>15.98</td>
<td>3.95</td>
<td>44.95</td>
<td>98.61</td>
</tr>
<tr>
<td>Total Sample</td>
<td>Domestic SMEs Sample</td>
<td>307</td>
<td>46.83</td>
<td>17.34</td>
<td>7.41</td>
<td>47.59</td>
<td>80.74</td>
</tr>
<tr>
<td>Total Sample</td>
<td></td>
<td>1038</td>
<td>45.26</td>
<td>16.41</td>
<td>3.95</td>
<td>45.36</td>
<td>98.61</td>
</tr>
</tbody>
</table>

a The foreign sales ratio is used to proxy for the firm’s degree of internationalization, which equals the percentage of foreign sales to total sales.

b The TCRI credit ratings are categorized into 9 levels of credit ratings. The higher rating of a firm means the higher credit risk it has.

c The dummy variable AQ Dummy equals one for the loans of Big 4 (5) audited firms and zero for the loans of non-Big 4 (5) audited firms.

d The dummy variable Collateral Dummy equals one for collateralized loans and 0 otherwise.

e Debt Ratio equals the percentage of total debts to total assets.

Data source: The Taiwan Economic Journal (TEJ) database.

From Table 1, we find that the mean loan interest rate and the mean debt ratio of multinational SMEs are 2.4 basis points and 2.23 percent, respectively, lower than those of domestic SMEs (the mean loan interest risk premiums are 16.9 and 19.3 basis points, respectively, and the mean debt ratios are 44.60 percent and 48.83 percent, respectively), suggesting that multinational SMEs, on average, pay lower interest rates on bank loans and have lower levels of debt financing than domestic SMEs. Hypothesis H3 is found to hold. We also find that, on average, multinational SMEs have higher audit quality, but smaller total assets, than domestic SMEs. In addition, there is no significant difference between multinational SMEs and domestic SMEs in terms of the levels of credit ratings and the incidence of collateral.
The effects of firm internationalization on loan interest rates

Our regression results for testing the effects of firm internationalization on loan interest rates are presented in Table 2. The first column contains coefficient estimates for the regression equation (1) based on the entire sample of 1,038 observations regarding bank loans (regression 4.1). The second column provides the basic tests of the hypothesized relationship between firm internationalization and loan interest rates.

Table 2: Ordinary Least Squares Regression Results for a Sample of 1,038 Revolving Bank Loans Active at the End of Each Year during the Period 2001-2006
(Independent Variable is the Loan Interest Rate minus the Risk-free Rate \(^2\))

<table>
<thead>
<tr>
<th>Independent Variables (^b)</th>
<th>Coefficient (Standard deviation)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>5.725 (0.890)</td>
<td>0.000</td>
</tr>
<tr>
<td>Foreign Sales Ratio (FS/TS)</td>
<td>-0.0035 (0.001)</td>
<td>0.002</td>
</tr>
<tr>
<td>Ln (Total Assets)</td>
<td>-0.391 (0.062)</td>
<td>0.000</td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>0.299 (0.032)</td>
<td>0.000</td>
</tr>
<tr>
<td>AQ Dummy</td>
<td>-0.085 (0.082)</td>
<td>0.039</td>
</tr>
<tr>
<td>Collateral Dummy</td>
<td>0.136 (0.077)</td>
<td>0.077</td>
</tr>
<tr>
<td>ICT Dummy</td>
<td>-0.269 (0.079)</td>
<td>0.001</td>
</tr>
<tr>
<td>Number of Observations</td>
<td>1038</td>
<td></td>
</tr>
<tr>
<td>Adjusted R(^2)</td>
<td>0.193</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>29.006 (0.000)</td>
<td></td>
</tr>
</tbody>
</table>

\(^2\) The regression model is \(RP_t = \alpha_0 + \alpha_1 FSR_t + \alpha_2 Ln(TA_t) + \alpha_3 CR_t + \alpha_4 AQ_t Dummy + \alpha_5 COL_t Dummy + ICT Dummy + \varepsilon\).

\(^b\) RP\(_t\) is the risk premium on bank loans for the firm in year \(t\); FSR\(_t\) is the foreign sales ratio, which is used to proxy for the firm’s degree of internationalization; Ln(Total Assets) is the natural logarithm of the borrowing firm’s total assets (NT$’000); Credit Ratings is the credit rating level of the borrowing firm; AQ\(_t\) Dummy is the dummy variable to proxy for audit quality, which equals one for loans of Big 4 (5) audited firms and zero for loans of non-Big 4 (5) audited firms; COL\(_t\) Dummy equals one for collateralized loans and 0 otherwise; and ICT Dummy equals one for information and communications technology (ICT) firms and 0 otherwise.

From the first column of Table 2, the regression results are indicative of a good explanatory power (the adjusted \(R^2\) value is 0.193) and the F-statistic is significant at the 0.001 level. The coefficient of the FSR\(_t\) is both significantly (P-value = 0.002) and negatively (-0.0035) related to the interest rates on bank loans, suggesting that SMEs with a higher DOI pay lower interest rates, on average, than SMEs with a lower DOI. Previous studies have linked firm internationalization to the cost of debt and have suggested that firm internationalization is negatively correlated with the cost of debt (Shapiro, 1978; Reeb et al., 2001; Mansi and Reeb, 2002). However, Burgman (1996) and Armstrong and Riddick (1998) provide evidence of inconsistent empirical results. Our study further provides new empirical evidence that the firm’s DOI is negatively correlated with the cost of debt. Hypothesis H1 is found to hold.

In addition, the coefficients of Ln (TA\(_t\)) and AQ\(_t\) Dummy are both significantly (P-value = 0.000 and
0.039, respectively) and negatively (-0.391 and -0.085, respectively) related to the interest rates on bank loans, indicating that SMEs that have higher total assets or purchase Big 4 (5) audits enjoy lower interest rates, on average, than SMEs that have lower total assets or purchase non-Big 4 (5) audits. The coefficient of ICT Dummy is also significantly (P-value = 0.001) and negatively (-0.269) related to the loan interest rates, suggesting that ICT SMEs are able to benefit from lower interest rates, on average, than non-ICT SMEs.

On the other hand, the empirical results of regression equation (1) indicate that the coefficients of CRt and COLt Dummy are both significantly (P-value = 0.000 and 0.077, respectively) and positively (0.299 and 0.136, respectively) related to the interest rates on bank loans, suggesting that SMEs with worse credit ratings or with collateral face higher interest rates, on average, than SMEs with better credit ratings or without collateral. These results are consistent with those of Reeb et al. (2001) and Czarnitzki and Kraft (2007), which suggests that well credit-rated firms will benefit from lower interest rates while badly credit-rated firms will be subjected to higher interest rates.

The effects of firm internationalization on debt ratios

Our regression results for examining the relationship between firm internationalization and the level of debt financing are presented in Table 3. The first column contains coefficient estimates for regression equation (2) based on the entire sample of 1,038 revolving bank loans (regression 4.2). The second and third columns contain coefficient estimates for regression equation (2) based on the subsamples, namely, 731 multinational SMEs and 307 domestic SMEs, respectively (regression 4.3 and regression 4.4).

Table 3: Ordinary Least Squares Regression Results for the Full Sample and Subsamples of 1,038 Revolving Bank Loans Active at the End of Each Year during the Period 2001-2006

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Regression 4.2 Full SMEs sample</th>
<th>Regression 4.3 Multinational SMEs Subsample</th>
<th>Regression 4.4 Domestic SMEs Subsample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient (Standard deviation)</td>
<td>Coefficient (Standard deviation)</td>
<td>Coefficient (Standard deviation)</td>
</tr>
<tr>
<td>Intercept</td>
<td>-80.17 (8.404)</td>
<td>-41.948 (10.945)</td>
<td>-135.558 (13.954)</td>
</tr>
<tr>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Foreign Sales Ratio</td>
<td>-0.054 (0.011)</td>
<td>-0.0482 (0.016)</td>
<td>-0.376 (0.250)</td>
</tr>
<tr>
<td></td>
<td>0.000</td>
<td>0.002</td>
<td>0.083</td>
</tr>
<tr>
<td>Ln (Total Assets)</td>
<td>-6.800 (0.813)</td>
<td>-9.874 (1.035)</td>
<td>-3.018 (1.375)</td>
</tr>
<tr>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td>0.029</td>
</tr>
<tr>
<td>Credit Ratings</td>
<td>8.598 (0.000)</td>
<td>8.199 (0.372)</td>
<td>9.352 (0.607)</td>
</tr>
<tr>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Ln (Sales)</td>
<td>12.575 (0.620)</td>
<td>13.028 (0.082)</td>
<td>12.479 (1.094)</td>
</tr>
<tr>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>No. of Observations</td>
<td>1038</td>
<td>731</td>
<td>307</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.484</td>
<td>0.473</td>
<td>0.546</td>
</tr>
<tr>
<td>F-statistic</td>
<td>243.760</td>
<td>164.794</td>
<td>93.144</td>
</tr>
<tr>
<td></td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The regression model is: $DR_t = \beta_0 + \beta_1 * FSR_t + \beta_2 * (\text{Ln(Total Assets)}) + \beta_3 * CR_t + \beta_4 * (\text{Ln(Sales)}) + \epsilon$. The full SMEs sample consists of 1,038 revolving bank loans; the multinational SMEs subsample consists of 731 revolving bank loans; and the domestic SMEs subsample consists of 307 revolving bank loans.

Data source: The Taiwan Economic Journal (TEJ) database.
From the first column of Table 3, the empirical results of regression equation (2) are indicative of a good explanatory power (the adjusted \( R^2 \) value is 0.484) and the \( F \)-statistic is significant at the 0.001 level. The coefficient of \( FSR_t \), is both significantly (P-value = 0.000) and negatively (-0.054) related to the level of debt financing, suggesting that SMEs with a higher DOI have lower debt ratios, on average, than SMEs with a lower DOI. In addition, the coefficient of \( \ln(TA_t) \) is also significantly (P-value = 0.000) and negatively (-6.800) related to the level of debt financing, indicating that SMEs that have higher total assets will have lower debt ratios, on average, than SMEs that have lower total assets. On the other hand, the empirical results of regression equation (2) indicate that the coefficients of \( CR_t \) and \( \ln(Sales) \) are both significantly (P-value = 0.000) and positively (8.598 and 12.575, respectively) related to the level of debt financing, suggesting that SMEs with worse credit ratings or higher total sales will have higher debt ratios, on average, than SMEs with better credit ratings or lower total sales.

From the second and third columns of Table 3, the empirical results of regression equation (2) indicate that the level of debt financing is negatively correlated with firm internationalization both in the multinational SMEs subsample and in the domestic SMEs subsample at the 0.002 and 0.083 levels, respectively. The coefficients of \( FSR_t \) in the two subsamples are -0.048 and -0.376, respectively, suggesting that SMEs with a higher DOI have lower debt ratios, on average, than SMEs with a lower DOI. Previous studies have linked firm internationalization to the level of debt financing and have found evidence of inconsistent results. Most recent studies indicate that firm internationalization is positively correlated with the level of debt financing (Chkir and Cosset, 2001; Reeb et al., 2001; Mansi and Reeb, 2002). However, many empirical studies suggest that the results are inconsistent (Fatemi, 1988; Lee and Kwok, 1988; Burgman, 1996; Doukas and Pantzalis, 2003). Our study provides further empirical evidence that the SME’s DOI is negatively correlated with the level of debt financing in an emerging market. Hypothesis H2 is found to hold.

CONCLUSIONS AND IMPLICATIONS

Using a sample of 1,038 revolving bank loans extended to publicly-listed SMEs in Taiwan, we reinvestigate the effects of firm internationalization on the interest rates of such bank loans and the level of debt financing. Our research is motivated by the inconclusive results of empirical studies regarding the effects of firm internationalization on debt costs and the relationship between firm internationalization and debt ratios, and the lack of such research that focuses on the SMEs in emerging markets. By using multiple regressions, we test whether an SME’s degree of internationalization affects the risk premium associated with revolving bank loans and analyze the relationship between the SME’s internationalization and its debt ratios, while controlling for other potentially important firm and loan characteristics.

Our empirical results show that the SME’s internationalization negatively affects the interest rates on bank loans, suggesting that an SME with a higher DOI enjoys lower interest rates, on average, than an SME with a lower DOI. This finding is consistent with those of most previous studies and is probably due to the benefits of diversification (Reeb et al., 2001).

On the other hand, our empirical results indicate that the SME’s internationalization negatively affects the level of debt financing, suggesting that an SME with a higher DOI has a lower debt ratio, on average, than an SME with a lower DOI. By dividing the total sample into two subsamples, namely, multinational SMEs and domestic SMEs, we find that multinational SMEs on average enjoy interest rates benefit on bank loans that are 2.4 basis points lower and have a 2.23 percent lower level of debt financing than domestic SMEs. Moreover, the empirical regression results also indicate that the coefficients of \( FSR_t \).
in the two subsamples are negatively related to the level of debt financing, also suggesting that SMEs with a higher DOI have lower debt ratios, on average, than SMEs with a lower DOI. These findings are not consistent, however, with those of most recent empirical studies, which may be explained by the theories that multinational SMEs have more profitable growth opportunities (Jensen, 1986) or have higher agency costs of debt (Lee and Kwok, 1988; Doukas and Pantzalis, 2003) than domestic SMEs.

The main contribution of this study lies in its directly testing whether firm internationalization affects the loan interest rates as well as the debt ratios of SMEs in an emerging market. Our findings provide empirical evidence that a higher DOI leads to lower interest rates on bank loans to SMEs and results in a lower level of debt financing by the SMEs, implying that multinational SMEs probably enjoy more benefits from diversification and more growth opportunities, while facing higher agency costs of debt than domestic SMEs. These empirical results can be compared with those of industrialized economies.

REFERENCES


