

## The effect of interaction between internationalization and strategic pursuance on the use of foreign currency denominated debt: in the context of Korean MNEs<sup>\*</sup>

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### Abstract

**Purpose** – This study investigates the effect of MNEs' characteristics on the use of foreign currency denominated debt in the context of Korean firms. This study examines the relationship between MNEs and the use of foreign debt focusing on the accessibility to the capital market in addition to the motive of hedging against foreign exchange exposure.

**Research design and methodology** – Probit estimation is employed for estimating significant factors in determination of the use of foreign debt by firms. The dependent variable is a dummy variable to indicate whether a firm uses foreign debt or not at the end of 2004. Independent variables include foreign subsidiaries ratio, export to sale, R&D expenditure to sale, and credit rating.

**Results** – The results show that the interaction between the level of internationalization represented by intra-regional diversification and the strategic characteristics embedded in the region of entry affects the use of foreign debt. In case of a high level of diversification within the developing region with a strong pursuit of asset exploitation, MNEs are more likely to use foreign debt, whereas a high level of diversification within the developed region with a strong pursuit of asset seeking, MNEs are less likely to use foreign debt.

**Conclusions** – The differences between MNEs in terms of intra-regional diversification, strategic orientation, and the accessibility to capital markets as well as the hedging motive affect the use of foreign debt.

**Keywords:** Foreign Currency Denominated Debt, Strategic Pursuance, MNE, Internationalization, Intra-region Diversification, Accessibility to Capital Market, Foreign Exchange Exposure Hedge

**JEL Classification Code:** F23, G32.

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## 1. Introduction

The world has witnessed a remarkable growth of global business expansion since 2000. In line with this trend, the amount of foreign direct investments (FDI) made by Korean firms has also risen to USD 6.3 billion at the end of the year 2000, to USD 46.5 billion at the end of 2011, and to USD 49.6 billion at the end of 2016 as approximate figures.<sup>1</sup> Korean firms' financing activities also involved borrowing foreign currencies during the past decades, which led to the increase in the use of foreign currency denominated debt (hereinafter referred to as "foreign debt ") since the 2000s. The Bank of Korea statistics show that the amount of foreign debt held by the private sector has increased from about USD 25 billion as of 1994 to about USD 48 billion as of 2002. The number posted around USD 139.4 billion in 2017.<sup>2</sup> More specifically, the amount of foreign debt held by the non-financial entities amounted to around USD 109.3 billion in 2017, trending up from around USD 25 billion in 1994 and USD 39.8 billion in 2002. Despite the growing trend of financing in foreign currency, the use of foreign debt by Korean firms has failed to draw meaningful attention from academia.

Major foreign studies on the use of foreign debt include Kedia and Mozumdar (2003), Keloharju and Niskanen (2002), and Allayannis and Ofek (2001), which mainly deal with the determinant of the use of foreign debt by firms. On the other hand, Korean major literatures tend to focus more on the relationship between the use of foreign debt and the corporate value or foreign exchange exposure (hereinafter "FX exposure ") (Bae, Kim, & Kwon, 2016; Kwon, 2007; 2013). Therefore, unlike the existing literatures, this study attempts to have a closer look at the use of foreign debt by Korean firms amid relatively scarce research effort in the area. Further, this study accommodates the capital-market accessibility perspective which has not been rigorously covered in relation to the use of foreign debt.

Existing studies on the use of foreign debt by firms show varying results with regards to the significant determinant depending on the sample each study employs. Some studies find the main motive in hedging against FX exposure (Allayannis & Ofek, 2001; Graham & Harvey, 2001; Kedia & Mozumdar, 2003). Others set forth another possible motive of foreign debt use in addition to FX exposure hedging: the motive of making use of favorable financing condition such as interest rate differentials in raising capital (Brown, Ongena, & Yesin, 2011; Keloharju & Niskanen, 2001). While hedging against FX exposure tends to draw more attention from researchers as a major determinant of foreign debt use, the impact of credit market access including that of accessibility to domestic capital markets is not considered sufficiently enough in their investigation. Accessibility to internal or external capital markets can be a significant factor affecting the use of foreign debt by firms based on the implication of pecking order theory, and this study aims to deal with it (Javier & Juan, 2005; Jong, Verbeek, & Verwijmeren, 2011).

On the other hand, some of the previous studies on MNEs' use of foreign debt try to find the relationship between MNEs and the use of foreign debt without considering the operational characteristics of MNEs. In this context, this study attempts to fill the gap by examining the determinants of foreign debt use by firms from the perspective of internal/external market accessibility and MNEs' characteristics such as the level of internationalization and their strategic motive in each international expansion. That is, having considered MNEs' characteristics based on the heterogeneity among MNEs in the analysis is expected to be another point of elaboration to the existing literature. MNEs operate in multiple foreign countries or regions by setting up subsidiaries and the countries and the regions MNEs enter are related to their level of internationalization and likely to imply their strategic concern. The sequential entry theory argues that firms are likely to start their global expansion by entering a small number of countries and the physically and culturally neighboring countries. As firms accumulate their experience of international expansion, they gradually go to more countries/regions and the ones distant from them both physically and culturally (Chang, 1995; Goa & Pan, 2010).

The probability of using foreign debt is affected by the level of internationalization with cross sectional differences between firms and has effect on the magnitude of FX exposure and accessibility to capital markets (Bartram, 2008; Brown, Ongena, & Yesin, 2011; Kedia & Mozumdar, 2003; Pantzalis, Simkins, & Laux, 2001). Considering MNEs' strategic orientation in foreign market entry and operation, MNEs' strategic concern and operational characteristics delineated by 'asset seeking' which pursues differentiation or 'asset exploitation' which pursues efficiency can have an influence on the probability of using foreign debt in terms of the magnitude of FX exposure and accessibility to capital markets.

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<sup>1</sup> The Bank of Korea >economic statistics system> FDI <http://ecos.bok.or.kr/>

<sup>2</sup> Foreign debt held by the private sector refers to the external debt borrowed by the entities excluding the government, the central bank, and deposit institutions. The Bank of Korea >economic statistics system> external debt <http://ecos.bok.or.kr/>

The result shows that the interaction between the level of internationalization in terms of intra-regional diversification and MNEs' strategic concern in operating in specific overseas regions has an impact on the use of foreign debt by Korean firms. It means that the level of internationalization does not directly affect the use of foreign debt. Rather, the strategic concern involved in the specific regional operation can be an antecedent when explaining the significant effect of intra-regional diversification on the use of foreign debt. It also implies that the use of foreign debt can be affected by the accessibility to internal/external capital markets as well as by the FX hedging motive. It can provide another perspective to the use of foreign debt in addition to FX exposure hedging and policy implications on imposing regulations on the use of foreign debt. Chapter 2 introduces the previous studies on the use of foreign debt and the hypotheses proposed by this study. Chapter 3 deals with the methodology and Chapter 4 shows the results. Lastly, the conclusion of this study is followed.

## **2. Literature Review and Hypotheses Development**

### **2.1. Literature Review**

Existing studies on the use of foreign debt include Kedia and Mozumdar (2003) and Allayannis and Ofek (2001), which analyze the significant factors affecting the use of foreign debt employing a sample of large US firms and show that firms use foreign debt mainly for FX exposure hedging purposes. Kedia and Mozumdar (2003) reckon that hedging against FX exposure and information asymmetry due to segmented capital markets are significant factors in determining foreign debt use. They also show that MNEs are likely to issue in a currency of the foreign countries where their foreign subsidiaries are located or to issue in a foreign currency that is highly correlated with the currency of the foreign countries of their subsidiary operation. This explains that part of the motive of the firms using foreign debt is to hedge against FX exposure. In other words, MNEs are likely to make use of foreign debt in the form of a straight hedge or cross hedge. With regard to the segmented capital markets, they find that some significant indicative factors, such as corporate size and good credit rating that can lower the information asymmetry for foreign investors, affect the use of foreign debt in the currency of the country of subsidiary operation.

Keloharju and Niskanen (2001) investigate on the use of foreign debt by Finish firms and show that firms use foreign currency debt to secure capital with more favorable condition besides the motive of hedging against FX exposure. They find that the interest rate differentials between domestic and foreign markets affect the use of foreign debt by Finish firms in addition to FX exposure hedging. Brown et al. (2011b) investigate the factors affecting the use of foreign debt by small firms in 25 transition economies and find that foreign revenue is more strongly related to the use of foreign debt than the interest rate differentials. Other studies show that the accessibility can have an impact on the use of foreign debt in addition to FX exposure hedging.

As a general approach to the accessibility to capital markets, Brown, Ongena, Popov, and Yesin (2011) survey on the access to bank credit by 8387 firms in 20 countries comparing the firms in Western Europe and with those in Eastern Europe. Their major findings include firms with a higher need for capital (exporters) tend to apply more for borrowing and different tendencies in seeking credit between Western and Eastern European firms. For Eastern European firms, if they are not applying for credit, it is mainly because of lending conditions like a high interest rate and the stronger collateral requirement. On the other hand, firms in Western Europe, if they do not apply for credit, opt not to do so simply because they do not need the capital. They also argue the negative relationship between credit constraint and corporate performance in such a way of lower probability to invest in R&D or lower level of a new product launch. Binks and Ennew (1993) argue the importance of information asymmetry for small firms in particular in relation to accessibility to capital markets and collateral is one of the ways to reduce the constraint. They find that growth firms are likely to encounter credit constraint and their relationship with banks can ameliorate the constraint.

With regards to firm's accessibility to capital markets in examining the use of foreign debt by firms, Mora, Neaime, and Aintablian (2013) examine the use of foreign debt by Lebanese firms through surveys with a focus on the case where domestic banks intermediate the dollar denominated debt. They find that exporters are more likely to incur dollar denominated debt for hedging and firms with "easily verifiable collateral" and "higher net worth" are more likely to access dollar credit. They find the importance of information friction and collateral as major factors for firms to access dollar credit even when the domestic banks intermediate a dollar credit transaction. Based on such previous research, the use of foreign debt is likely to be affected by a firm's motive for FX exposure hedging, favorable capital raising, and accessibility to internal/ external capital markets.

In the meantime, a higher level of international commitment leads to active engagement in FX exposure hedging and accessibility to capital markets positively affects the use of foreign debt (Kedia & Mozumdar, 2003; Keloharju

& Niskanen, 2001; Reeb, Mansi, & Alee, 2001). According to Kedia and Mozumdar (2003), the level of international commitment such as foreign sales ratio, foreign asset ratio, and foreign subsidiary ratio shows a positive relation to the use of foreign debt. Other studies imply the positive relationship between the level of international commitment (the number of countries the firm enters or the ratio of foreign subsidiaries to total subsidiaries) and the use of foreign debt as a hedging instrument (Aabo, 2006; Allayannis & Ofek, 2001; Graham & Harvey, 2001). These studies have mainly focused on the hedging motive of MNEs intrinsic to foreign operation whereas other factors related to capital raising or accessibility to capital markets are not covered very rigorously.

Another point from the previous studies on the use of foreign debt is the relationship between MNEs and the use of foreign debt. Even though many studies find that MNEs' international commitment variable is positively related to the use of foreign debt, an empirical evidence on the clear effect of MNEs on the use of foreign debt is not found (Keloharju & Niskanen, 2002). It can be attributed to the lack of MNEs' strategic feature in their investigation. Joliet and Muller (2013) show that the differences between MNEs affect the determination of capital structure throwing the question on the homogeneity of MNEs. The result shows that foreign regions MNEs enter affect their capital structure. International expansion has an impact on the capital structure whereas the entry into developed countries does not affect the capital structure. Other studies illustrate the results that an MNE's active or passive approach in implementing an international strategy affects its capital structure, and an ownership structure based active pursuit of an international strategy tends to increase debt ratio (Ban, 2009).

Mansi and Reeb (2002) explain the effect of international activity on the debt ratio and capital raising. They find that a higher level of internationalization (using the composite index of foreign sales ratio, foreign asset ratio, and the number of geographic segments a firm enters) is on average related to the lower cost of capital and the higher debt ratio. Internationalization affects a firm's performance as well as the capital structure, either through international experience or intra-regional diversification (Chang, 1995; Qian et al., 2010). The number of regions a firm enters means the level of internationalization of the firm in terms of international experience. A specific region of entry can represent its strategic characteristic (Cui, Meyer & Hu, 2014; Duanmu, 2012; Makino, Lau & Yeh, 2002; Ramasamy, Yeung & Laforet, 2012; Zhang, Park & Kim, 2005; Zheng, Wei, Zhang & Yang, 2016).

## **2.2. Hypotheses development**

The level of internationalization and strategic orientation, which is represented by international experience and the region of entry respectively, is assumed to affect the magnitude of FX exposure and accessibility to the capital market and ultimately affect the use of foreign debt. The firm with abundant international experience is likely to have a lot of knowledge and experience in handling FX exposure and make an easier access to capital markets, which leads to a higher probability of using foreign debt. In the meantime, firms experienced in internationalization can make use of financial derivatives or other alternative methods to cope with FX exposure, which can reduce the probability of using foreign debt.

If the level of internationalization is viewed from the perspective of intra-regional diversification, more diversified firms within a specific region tend to show positive performance (Qian, Li, Li & Qian, 2008; Qian, Li & Rugman, 2013; Qian, Khoury, Peng & Qian, 2010). It leads to infer that highly diversified firms within a specific region are more likely to use foreign debt since they are in a favorable position to have an access to capital markets. In the meantime, the firm with a higher level of intra-regional diversification can increase the total business risk in spite of the effect of reduced risk through risk diversification. This can work as a constraint on the use of foreign debt and the firm is more likely to make use of internal capital, leading to a reduced probability of using foreign debt (Burgman, 1996; Chen, Cheng, He & Kim, 1997).

An MNE is characterized by foreign presence and its subsidiaries set up in the foreign countries, and choosing a specific region of entry is one of the major strategic issues. According to previous studies, especially in case of MNEs from newly industrializing economies pursuing strategic asset seeking under the AMC (Awareness-Motivation-Capability) framework (Cui et al. 2014), they tend to choose developed regions such as the United States or Europe as a location of entry. In case of pursuing market/efficiency, developing region/countries are likely to be the places of choice (Makino et al., 2002). Makino et al. (2002) argue that the choice of location is affected by the firm's pursuance of 'asset exploitation' or 'asset seeking'. The firms entering the developed regions are interested in networking, collecting information, and catching up with market trends which are related to the region specific asset. The firms are likely to belong to a highly sophisticated industry and feature a higher level of R&D expenditure (Chen & Chen, 1998) with a higher growth potential, and pursue a differentiation strategy (Cui et al., 2014).

The firms entering the developing regions tend to be oriented to reducing the cost such as the cost of labor or raw material procurement (Makino et al., 2002). They are likely to belong to the traditional manufacturing industry and put priority on the maximization of profits by way of reducing cost (Zhang et al., 2005). The differences in strategy

and operation arising from the choice of a foreign location can affect the use of foreign debt. The more developed countries a firm enters, the more likely it pursues strategic 'asset seeking', belongs to a sophisticated industry, and has higher R&D intensity. The pursuit of 'asset seeking' is inclined toward 'asset exploration' rather than 'asset exploitation'. This type of firms, even if they are at the initial stage of internationalization, can take an active approach to international expansion and are likely to enter a developed region, which offer a favorable condition to acquire knowledge-based resources (technology, brand, managerial skill, etc.), which reside outside the firm. On the other hand, the firms pursuing market/efficiency enter developing regions and try to secure their market status in a foreign location by acquiring and exploiting the location specific asset, which is presumed to give the firm a competitive advantage (Cui et al. 2014).

Of the determinants of the use of foreign debt, R&D is one of the factors indicating firms' accessibility to capital markets since it is related to information asymmetry (Alp, 2013; Brown et al. 2011a; Kedia & Mozumdar, 2003). Pursuing highly strategic 'asset seeking', the firm is likely to show higher R&D intensity and be evaluated to have a higher growth potential. This helps the firm earn an easier access to capital markets leading to a higher probability of using foreign debt.

In the meantime, if a firm shows a higher level of pursuing strategic asset seeking, it implies a higher growth potential. However, the firm tends to lack sufficient physical assets in the local country if it enters the region with an intention of 'asset seeking'. It means insufficient collateral, which can be a constraint in accessing a capital market. This in turn can reduce the probability for the firm to borrow in foreign currency.

Meanwhile, if a firm is focused more to the developing regions, it is more likely to pursue market/efficiency seeking and be highly interested in the production cost factor. It tends to produce or sell the products sensitive to market price by setting up production facilities making use of cheap production factors in the local market. This type of firm tends to show a lower growth potential and a higher level of debt. The firm, however, generates export or foreign revenue on an ongoing basis and owns physical facilities locally such as production lines. Thus, it is more advantageous for the firm to access capital markets, increasing the probability of using foreign debt, because it can provide collateral, have a higher level of business awareness, and strengthen its status in the local market – advantageous factors to establish a good relationship with banks. If the firm strongly pursues efficiency, however, it is likely that the firm is evaluated to have a lower competitive advantage, which subsequently leads to a lower credit rating. This can limit the firm's access to capital markets with unfavorable financing conditions, leading to a lower probability of using foreign debt. Based on the argument described above, this study sets forth the following hypotheses:

H1: The level of internationalization (international experience) is positively related to the use of foreign debt.

H2: The effect of intra-regional diversification on the use of foreign debt varies depending on the region of entry.

H3: The interaction effect of the intra-regional diversification and the strategic motive embedded in the region of entry on the use of foreign debt varies depending on the region of entry.

H3-a: Higher degree of diversification within the developed region and a higher level of motive in strategic asset seeking in foreign market entry is negatively related to the use of foreign debt.

H3-b: Higher degree of diversification within the developing region and a higher level of motive in asset exploitation in foreign market entry is positively related to the use of foreign debt.

### **3. Methodology**

#### **3.1. Sample**

The sample is composed of 228 Korean manufacturing firms which have at least one subsidiary abroad and all the information required for this study is available. All the information used in the study is collected from the data of the year 2004. Outward FDI by Korean firms is observed to have resurged in the early 2000s after a standstill around the Asian Financial Crisis in 1998. In the year of the investigation of this study, Korean firms' overseas presence is distributed across the developed and developing regions in a balanced manner, in terms of geographic diversification. The investigation period of 2004 is under the normal circumstances between the Asian Financial Crisis of 1997-1998 and the US originated financial crisis of 2007-2008.

Variables with regards to the foreign regions follow Pantzalis (2001). That is, foreign regions include eight areas of NAFA, European Union, Western Europe, advanced Asia, Eastern Europe, Central and South America, Africa, and other Asian countries. The former four areas, NAFA, European Union, Western Europe, and advanced Asia, are classified as a developed region and the latter four areas of Eastern Europe, Central and South America, Africa, and other Asian countries are referred to as developing countries and regions in this study.

Information on the use of foreign debt, subsidiaries, export, total asset, R&D intensity, credit rating, domestic debt, quick ratio, and overseas locations of subsidiaries is collected from the financial statements and the corresponding foot notes available on KISLINE or Nice Information Service. Information on whether firms use financial derivatives is retrieved from the DART, the local regulator's online portal for electronic disclosure. The book to market ratio is calculated as book value of equity divided by market value of equity at the end of 2004, which follows Geczy, Minton and Schrand (1997) and He and Ng (1998).

### 3.2. Model

Probit estimation is employed for estimating significant factors in determination of the use of foreign debt by firms. The dependent variable is a dummy variable to indicate whether a firm uses foreign debt or not at the end of 2004. If a firm uses foreign debt, dummy denotes as "1", otherwise, as "0". An independent/control variable showing a significant and positive sign is interpreted as a variable increasing the probability of the use of foreign debt by firms.

$$\begin{aligned} \Pr(\text{Foreign\_debt} = 1) = & \alpha_0 + \alpha_1 \text{Foreign\_subsids} / \text{total\_subsids} + \alpha_2 \text{Export} / \text{sale} \\ & + \alpha_3 \text{Ln}(\text{total\_asset}) + \alpha_4 \text{R \& D} / \text{sale} + \alpha_5 \text{Credit\_rating} + \alpha_6 \text{Derivative} \\ & + \alpha_7 \text{Domestic\_debt} / \text{total\_asset} + \alpha_8 \text{Quickratio} + \alpha_9 \text{B / M} + \alpha_{10} \text{ADVA} + \alpha_{11} \text{DEVA} \\ & + \alpha_{12} \text{ADVA} * \text{RD} + \alpha_{13} \text{DEVA} * \text{RD} + \alpha_{14} \text{ADVA} * \text{Credit\_rating} + \alpha_{15} \text{DEVA} * \text{Credit\_rating} \\ & + \varepsilon_i \end{aligned}$$

### 3.3. Variables

A probit regression is used to estimate the major factors affecting the decision on a firm's use of foreign currency denominated debt. The dependent variable is a dummy variable, which denotes "1" if a firm uses foreign debt or "0" otherwise. Independent variables include foreign subsidiaries ratio, export to sale, R&D expenditure to sale, and credit rating. Control variables include corporate size (Ln total asset), financial derivatives dummy (Derivatives), domestic debt level (Domestic debt/total asset), liquidity (Quick ratio), and growth option (Book to Market ratio). One of the independent variables, 'foreign subsidiaries/total subsidiaries', is a proxy for the level of internationalization since it shows international experience. The other proxy for the level of internationalization is the intra-regional diversification (DEVA/ADVA).<sup>3</sup> 'Export ratio' represents FX exposure, 'R&D intensity' refers to 'asset seeking', and 'credit rating' is used in relation to 'asset exploitation'.

In addition to these variables, the number of sub regions within a region in which a firm's subsidiaries are located and the interaction term with R&D ratio or credit rating are also included as an independent variable in the model. ADVA means the number of sub regions (i.e. NAFTA, etc.) within the developed region where a firm's foreign subsidiaries are located, whereas DEVA indicates the number of sub regions (i.e. Eastern Europe, etc.) within the developing region where a firm's foreign subsidiaries are located.

The explanations on the variables are as follows:

variables	Explanations
Foreign currency debt	Dependent variable Short term borrowing, long term borrowing, and long term liquidity debt in foreign currency As a dependent variable, dummy variable is used.

<sup>3</sup> Internationalization can be represented by international experience and the region of entry (Jolliet & Muller, 2013).

foreign subsidiaries ratio	Proxy for international experience The number of foreign subsidiaries divided by the number of total subsidiaries
export to sale	Proxy for FX exposure The won amount of export divided by total sale amount in won
corporate size (Ln total asset)	Natural log of a firm's total asset
R&D expenditure to sale	Proxy for asset seeking (differentiation pursuance) R&D expenditure divided by total sale amount in won
credit rating	Proxy for asset exploitation (market/efficiency pursuance) One of the numbers from 1 to 10 is given by NICE in the annual evaluation of a firm's financial and operational status. The lower the number, the better the credit status.
financial derivatives	Dummy variable is employed to indicate whether a firm uses financial derivatives or not. In case of "1", the firm uses financial derivatives.
domestic debt level	Debt amount in won divided by total asset
quick ratio (Liquidity)	Cash equivalent asset divided by short term debt
book to market ratio (B/M)	Book value of equity at the year end of 2004 divided by market value of equity at the year end of 2004 <sup>4</sup>
ADVA	Proxy for intra-regional diversification (developed region) the number of countries belonging to the advanced areas where a firm's foreign subsidiaries are located
DEVA	Proxy for intra-regional diversification (developing region) the number of countries classified as those of developing areas where a firm's foreign subsidiaries are located

#### 4. Results

<Table 1> shows the mean, median, and standard deviation of sample firms. It separately depicts descriptive features of the group of 90 firms with foreign debt and the group of 138 firms without foreign debt of the 228 sample firms in total. The values posted for the firms with foreign debt and those for the firms without foreign debt vary. In case of the median export/sale, corporate size, domestic debt level, and book to market ratio, firms using foreign debt seem to have higher values than the firms with no foreign debt. On the contrary, looking at R&D intensity and quick ratio, the firms not using foreign debt denote higher values. Regarding credit rating, variables of financial derivatives, the number of developed sub regions firms enter, and the number of developing sub regions firms enter show little difference in the median values between the two groups. These results are consistent with the notion that firms with a higher level of foreign operation involving exporting will have more incentives to use foreign debt to reduce FX exposure. Large firms and firms with a higher level of tangible assets have easier access to international capital markets. Firms with no foreign debt, however, show a relatively high level of R&D intensity and quick ratio, which implies firms with higher R&D intensity are capital abundant and vice versa. This suggests the possibility that a firm's higher level of liquidity enables the firm to engage in developing a technologically advanced product line. It is also consistent with Kedia and Mozumdar (2003), where they assume the negative sign under the segmented market condition since a firm with higher R&D and lower level of tangible asset is not noticeable enough for a foreign investor to become aware of.

Regarding the mean values, there are differences in R&D intensity, credit rating, and B/M. The firms using no foreign debt show a higher mean figure in R&D intensity and growth potential, and a better credit rating (lower figure). While there is no difference in median values between the firms with foreign debt and the firms without foreign debt, some levels of differences are observed in mean figures, i.e. firms with foreign debt tend to enter more places both the developed and developing regions. It implies that higher internationalization is related to the use of foreign debt.

<Table 2> shows correlation between variables in the model. Most variables do not show that they are highly correlated, which suggests no possible multicollinearity. Interestingly, there is a relatively higher positive correlation

<sup>4</sup> Following Geczy et al. (1997) and He & Ng (1998)

between the number of developed sub regions firms enter and the corporate size. This means the higher number of developed sub regions a firm enters, the larger a firm is, and vice versa. In addition, there is a significantly positive correlation between the number of developed regions a firm enters and R&D intensity. It means the higher number of developed sub regions a firm enters, the higher expenditure of R&D the firm shows, and vice versa. These results suggest that larger firms with higher R&D intensity tend to diversify the markets of entry in the developed region to seek strategic assets and they tend to belong to a technologically advanced industry (Chen & Chen, 1998; Makino et al., 2002). The number of developed sub regions is significantly correlated to the number of developing sub regions, export, corporate size, derivatives, R&D intensity, whereas the number of developing sub regions is significantly

**Table 1:** Descriptive Statistics

Independent Variables	Firms with no foreign debt			Firms with some foreign debt			All firms		
	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
Foreign subsidiaries /total subsidiaries	0.5905	0.5441	0.2818	0.5763	0.5505	0.2625	0.5819	0.5505	0.2698
Export/sale	0.3778	0.3157	0.2964	0.4728	0.4817	0.3117	0.4353	0.4518	0.3086
Ln (total asset)	12.1473	11.9491	1.3426	12.8381	12.3949	1.6167	12.5654	12.1996	1.5487
R&D/sale	1.9500	0.9000	2.8658	1.5204	0.76	1.9599	1.6900	0.795	2.3627
Credit rating	4.8444	5	1.8415	5.3405	5	1.8183	5.1447	5	1.8396
Derivatives	0.2111	0	0.4103	0.3550	0	0.4802	0.2982	0	0.4584
Domestic debt/total asset	0.3786	0.3801	0.2119	0.4104	0.4098	0.2071	0.3978	0.4064	0.2091
Quick ratio	1.7132	1.0479	1.7555	0.9507	0.8413	0.6170	1.2517	0.8928	1.2560
Book to Market ratio	0.5436	0.2825	0.6067	0.9668	0.4878	2.5176	0.7997	0.4219	2.0031
No of Advanced area	0.8555	1	0.9779	1.0072	1	1.0636	0.9473	1	1.0311
No of Developing area	0.9444	1	0.6596	0.9710	1	0.5787	0.9605	1	0.6106
Number of firms	90			138			228		

**Table 2:** Correlation

	ADVA	DEVA	Export	Ln total asset	FCD	Domestic debt/sale	R&D /sale	Credit rating	Quick ratio	B/M
ADVA	1.00									
DEVA	.1506 .0229	1.00								
Export	.1995 .0025	.1040 .1174	1.00							
Ln total asset	.5032 .0000	.2393 .0003	.0967 .1456	1.00						
FCD	.1824 .0057	.0108 .8716	.2278 .0005	.3158 .0000	1.00					



Domestic debt/Tasset	.0401 .5465	.0380 .5679	-.1226 .0646	.0125 .8515	.0412 .5360	1.00				
R&D /sale	.1465 .0269	.0474 .4763	-.0219 .7422	-.0092 .8898	.0306 .6455	-.0141 .8322	1.00			
Credit rating	-.0238 .7204	-.0380 .5678	.0399 .5491	-.2008 .0023	-.0253 .7041	.6837 .0000	.0161 .8093	1.00		
Quick ratio	-.0756 .2556	.0098 .8831	.0797 .2306	-.1373 .0383	-.0728 .2740	-.5342 .0000	-.0269 .6861	-.4617 .0000	1.00	
B/M	-.1072 .1063	-.0171 .7968	.0557 .4029	-.1662 .0120	-.0991 .1357	.1463 .0272	-.0583 .3805	.2910 .0000	-.1109 .0948	1.00

The below figures are p-values.

correlated to the number of developed sub regions and corporate size. It is likely that firms have less incentive to borrow in foreign currency in order to hedge against FX exposure partly due to more frequent use of financial derivatives even though they can access capital markets easily.

<Table 3> shows a few factors affecting firms' decision on the use of foreign debt (382 firms) when the intra-regional diversification variables or interaction between a firm's overseas location and R&D/credit rating is not included. Corporate size (LN total asset), credit rating, and the use of derivatives show positive relations to the use of foreign debt, which means larger firms or firms with a worse credit rating or firms using financial derivatives tend to have a higher probability of using foreign debt. On the other hand, domestic debt level and level of liquidity (quick ratio) has a negative effect on the use of foreign debt, which is consistent with Nguyen and Faff (2006) and Kedia and Mozumdar (2003) at an aggregate level. It is interpreted that firms use foreign debt depending on the capital structure constraint and possible use of internal capital. While export ratio does not show a significant effect, it turns into a significant sign in the results of <Table 4> (Model 1) and <Table 5>.

Liquidity (quick ratio) shows a negative and significant sign, which is consistent with Kedia and Mozumdar (2003) at an aggregate level in their study. B/M is positively related to the probability of using foreign debt, which is consistent with Keloharju and Niskanen (2001) and Aabo (2006), although it is contrary to the expectation of Kedia and Mozumdar (2003). According to <Table 3>, MNE dummy does not show its significant effect on the use of foreign debt which is also consistent with the result of Keloharju and Niskanen (2001). Therefore, this study takes a closer look at MNEs' characteristics in terms of internationalization, international experience and intra-regional diversification.

**Table 3:** The effect of MNEs on the use of foreign debt

	Coefficients	p-values
Constant	-2.6086***	0.002
MNE dummy	0.1068	0.500
Export/sale	0.2462	0.349
Ln (total asset)	0.2485***	0.000
R&D/sale	-4.3805	0.226
Credit rating	0.1774***	0.004
Derivatives	0.3016*	0.093
Domestic debt/total asset	-2.5457***	0.000
Quick ratio	-0.3388***	0.000
Book to Market ratio	0.1548	0.190
Pseudo R-squared	0.1678	

Log likelihood	-218.9302	
N	382	

\*\*\*, \*\*, \* denotes the significance level at 1%, 5%, and 10%, respectively.

<Table 4> illustrates the effect of an MNE's international experience on the use of foreign debt. Only the number of foreign subsidiaries is significant, whereas the number of countries and the number of foreign subsidiaries/total subsidiaries are not significant. Model 1 shows export ratio is significant in spite of non-significance both in Model 2 and Model 3. The number of foreign subsidiaries implies the increased level of business risk and it is not unfavorable condition to borrow in foreign currency. It tends to increase the need to hedge because of the higher level of export. <Table 4> shows a positive sign of B/M in all the Models 1-3, which are different from that of <Table 3>. It is also different from the expectation about B/M of Kedia and Mozumdar (2003), and Keloharju and Niskanen (2001). They assume a negative sign of B/M to the probability of using foreign debt since a higher hedging motive is assumed to come from the high bankruptcy cost (Nance, Smith & Smithson, 1993; Mian, 1996) and the underinvestment cost (Froot, Scharfstein & Stein, 1993; Nance et al., 1993). In case of the number of countries entered, it does not show a significant effect on the use of foreign debt, which means the general geographic diversification effect enjoyed by the firms seems to be overwhelmed by the corporate size effect, considering both the hedging motive and the accessibility to capital markets. Therefore, Hypothesis 1 is not supported.

Model 1 of <Table 5> shows the intra-regional diversification effect on the use of foreign debt. The diversification within the developed region and the developing region denotes a negative sign, while they are not significant. Export ratio is moderately significant and shows a positive relation to the use of foreign debt. Neither R&D intensity nor credit rating show a significant effect. Other control variables such as corporate size, domestic debt ratio, quick ratio, and book to market ratio are shown to be significant, whose signs are consistent with those of <Table 4>. Considering the consistent positive sign of book to market ratio (higher level of tangible assets), it is interpreted that the use of foreign debt is affected by the accessibility to capital markets due to the higher level of tangible assets as well as the FX exposure hedging motive. It is consistent with Kedia and Mozumdar (2003), and Keloharju and Niskanen(2001) in that corporate size and export ratio show a positive sign. It also suggests that corporate size is more important than the level of internationalization in the context of accessibility to capital markets.

Model 2 of <Table 5> includes variables proxy for the level of internationalization (international experience, intra-regional diversification) and the interaction between intra-regional diversification and strategic concern involved in foreign market entry. The number of advanced areas and the number of developing areas indicate the degree of geographic dispersion within each region. Intra-regional diversification within the developing region variable shows a significantly negative sign but intra-regional diversification within the developed region does not. It is interpreted that geographical diversification in the developing region contributes to reducing FX exposure and leads to a lower hedging activity and less incentive for firms to use foreign debt. Export ratio shows a higher level of significance compared to <Table 4> and Model 1 of <Table 5>, which shows a firm's hedging motive against FX exposure in the use of foreign debt. Liquidity (quick ratio) shows a significantly negative sign, which is consistent with Kedia and Mozumdar (2003) at an aggregate level in their investigation.

**Table 4:** The effect of international experience of MNEs on the use of foreign debt

	Model 1		Model 2		Model 3	
	Coefficient	p-values	Coefficient	p-values	Coefficient	p-values
Constant	-2.547325	0.016	-1.794794	0.085	-1.754803	0.085
N of foreign subsidiaries	-.0232868*	0.070				
N of countries entered			.0359592	0.821		
Foreign subsidiaries/total subsidiaries					.2845647	0.411
Export/sale	.5655419*	0.071	.4524707	0.152	.5099612	0.102

Ln (total asset)	.2613514***	0.000	.1984762***	0.007	2056473***	0.002
R&D/sale	-.0394597	0.348	-.0540835	0.197	-.0394597	0.233
Credit rating	.0190939	0.813	.0225002	0.778	.0214821	0.788
Derivatives	.248544	0.250	.2656019	0.213	.2680829	0.208
Domestic debt/total asset	-1.214097*	0.097	-1.273605*	0.073	-1.227991*	0.091
Quick ratio	-.4049015***	0.000	-.4026526***	0.000	-.3983886***	0.000
Book to Market ratio	.4442534***	0.010	.4310015***	0.010	.4476434***	0.010
Pseudo R-squared	0.1724		0.1643		0.1665	
Log likelihood	-126.57865		-127.81315		-127.48506	
N	228		228		228	

\*\*\*, \*\*, \* denotes the significance level at 1%, 5%, and 10%, respectively.

On the other hand, B/M shows a consistently positive sign on the use of foreign debt, which is consistent with the result of Keloharju and Niskanen (2001), and Aabo (2006). It is contrary to the expectation of Kedia and Mozumdar (2003), and Keloharju and Niskanen (2001) assuming a negative sign of B/M, which is based on the argument that a higher growth potential induces a higher tendency to hedge due to the higher level of bankruptcy cost (Nance et al., 1993; Mian, 1996) or underinvestment cost (Froot et al., 1993; Nance et al., 1993). It is interpreted in this study that a higher level of B/M can give a signal on the higher level of collateral to a capital market, which can be a facilitator for a firm to use foreign debt (Binks & Ennew, 2013; Mora et al., 2013). Considering Model 1 and Model 2 of <Table 5>, intra-regional diversification does not affect the use of foreign debt separately (Model 1). When considering the strategic concern of foreign market entry simultaneously, accessibility to capital markets can be more accommodated to explain the use of foreign debt and the diversification effect on the use of foreign debt comes to gain its negative explanatory power. It is interpreted either that the diversification effect itself reduces FX exposure or that the diversification itself does not help a firm have an easier access to capital markets.

**Table 5:** The effect of intra-regional diversification and strategic orientation of MNEs on the use of foreign debt

	Model 1		Model 2	
	Coefficients	p-values	Coefficients	p-values
Constant	-2.478167**	0.023	-1.6656	0.191
Foreign subsidiaries /total subsidiaries			-0.2610	0.473
Export/sale	.5548955*	0.078	0.7653**	0.017
Ln (total asset)	.258381***	0.001	0.2963***	0.000
R&D/sale	-.0437558	0.277	0.0142	0.850
Credit rating	.0266571	0.739	-0.2193*	0.099
Derivatives	.2519633	0.234	0.1829	0.417
Domestic debt/total asset	-1.238024*	0.095	-1.5942**	0.022
Quick ratio	-.40427***	0.000	-0.4497***	0.000

Book to Market ratio	.4443444***	0.009	0.5723***	0.003
No of Advanced area	-.1284337	0.248	-0.2008	0.491
No of Developing area	-.0233923	0.888	-1.0181*	0.075
ADVA*R&D			-0.0672**	0.041
DEVA*R&D			0.0303	0.590
ADVA*Credit			0.0453	0.395
DEVA*Credit			0.1992*	0.0552
Pseudo R-squared			0.2006	
Log likelihood			-122.2621	
N	228		228	

\*\*\*, \*\*, \* denotes the significance level at 1%, 5%, and 10%, respectively.

In the context of hedging, intra-regional diversification contributes to reducing FX exposure and it leads firms to use foreign debt less. Intra-regional diversification within the developed region has a lower level of incentive to hedge even when they can have an easier access to capital markets, which does not show the significant effect on the use of foreign debt. It is consistent with the finding of Brown et al. (2011a). When firms enter developed regions, they pursue 'asset seeking' such as searching information on new technology, product development and connecting to network necessary for the firm's strategy or product development. For these firms, FX exposure management is not so urgently required and geographical diversification within the developed region does not have an enormous effect on FX exposure. It means that geographical diversification within the developed region does not influence the use of foreign debt due to the lower level of hedging incentive.

On the contrary, when firms entering developing regions pursue 'asset exploitation' such as setting up production facilities and selling the products to the local market or a neighboring market, they are faced with larger FX exposure and thus try to reduce FX exposure through geographical diversification. They have a lower need to use foreign debt as a hedging instrument (Hypothesis 2 is not supported). Therefore, if the use of foreign debt is analyzed in terms of accessibility to capital markets, it is more relevant to take into consideration firm characteristics such as internationalization feature and strategic concern simultaneously, which can jointly affect the use of foreign debt by MNEs.

In relation to this point, Model 2 of <Table 5> shows the interaction effect of intra-regional and corporate characteristics like R&D intensity and credit rating. It means that firms with higher R&D ratio and those with more subsidiaries in developed regions do not tend to use foreign debt. It is interpreted that the firms with higher R&D entering developed regions with an aim to obtain a strategic asset such as information and access to network (Makino et al., 2002; Chen & Chen, 1998) do not have a higher level of need for FX exposure hedging. This leads to a lower probability of using foreign debt. In terms of accessibility to capital markets, those firms are likely to be under constraint due to a lower level of collateral and insufficient tangible assets in its presence. On the other hand, firms with higher R&D intensity and those with higher diversification in developing regions are indifferent to the use of foreign debt. Firms entering developing countries with higher R&D intensity are likely to have a firm specific advantage and in pursuit of 'asset exploitation' by internalizing the intangible asset (Pantzalis, 2001). These firms set up production facilities and make use of their comparative advantage in the local market such as superior managerial skill or differentiated products. They have less incentive to manage FX exposure and can make use of internal capital and they can have an easier access to capital markets due to higher awareness in the local market. This is, why they are indifferent to the use of foreign currency debt (Brown et al., 2011a).

Model 2 also shows the interaction effect of the intra-regional diversification and the credit rating. Intra-regional diversification within the developing region denotes a negative sign and the same is true for credit rating. The interaction term shows a significantly positive sign in relation to the use of foreign debt. Firms with a better credit status tend to use foreign debt. It is interpreted, however, firms that are more diversified in developing regions and with a lower credit status are likely to borrow in foreign currency. In terms of accessibility to capital markets, those

firms are likely to use foreign debt due to physical presence and the higher level of collateral (Mora et al. 2013). In addition, they need a higher level of investment capital since the firms are likely to build production facilities to lower the production cost such as for labor or raw materials. Therefore, when a firm enters developing countries with their insufficient internal capital, its credit rating positively affects the use of foreign debt. It means that firms with a worse credit rating (i.e. lower profitability) and high level of diversification within the developing regions are likely to use foreign debt.

On the contrary, when firms are highly diversified within the developed region with a lower credit status, their credit rating hardly affects the use of foreign debt. It is because firms entering developed regions tend to seek a strategic asset, and have lower levels of physical presence, hedging motivation and need for investment capital. In terms of accessibility to capital markets, those firms are under constraint of raising capital due to the lower level of collateral and brand awareness. Accordingly, firms with a low credit status and a high level of diversification in developed regions do not show a significant sign of the use of foreign debt (Brown et al. 2011a). Graham and Harvey (2001) find that managers consider the credit rating itself in their determination of the use of foreign debt.

Considering the contrasting effect of the interaction term between intra-regional diversification and strategic concern in Model 2 of <Table 5>, it is interpreted that the strategic concern factor affecting the use of foreign debt varies depending on the region of entry. In case of highly diversified firms within the developed region with higher R&D intensity do not tend to use foreign debt. When firms are diversified within developing regions, they separately seem to enjoy their geographical diversification effect as a natural hedge (model 2). If their intra-regional geographic diversification is viewed in combination of the lower credit status, however, they are likely to use foreign currency debt due to their easier access to capital markets (Hypothesis 3-a and 3-b are supported).

## **5. Conclusion**

This study investigates the effect of internationalization and the strategic orientation on the use of foreign debt from the perspective of Korean MNEs. This study also considers the context of different accessibility to capital markets of firms in addition to FX exposure hedging, which has drawn relatively much attention in the previous relevant literature. In addition, this study tries to elaborate MNEs' internationalization and strategic concern in foreign market entry in conjunction with the use of foreign debt.

Assuming intra-regional diversification represents the level of internationalization, a higher level of diversification within the developing region and a worse credit rating tend to show a higher probability of using foreign debt. On the other hand, a higher level of diversification within the developed region accompanied by higher R&D intensity is related to the lower probability of using foreign debt. Those results point to the effect of interaction between intra-regional diversification and the strategic orientation in foreign market entry on the use of foreign debt. Another finding is that depending on the region (developed or developing), the strategically sensitive factor related to the capital market accessibility varies. In case of the developed region, R&D intensity is more important than credit rating, whereas credit rating is a more important factor than capital market accessibility in the developing region. Next, this study shows the relationship between MNEs and the use of foreign debt in consideration of differences among MNEs in terms of internationalization and the strategic concern, which sets this study apart from the previous studies. Existing studies argue that MNEs are more likely to issue a foreign debt. Still, they do not find a direct relationship between MNEs and the use of foreign debt. It is interpreted that they assume homogeneity of MNEs, which is different from reality. This study can fill the gap by accommodating the differences in geographic diversification and strategic concern, linking MNEs and the use of foreign debt.

The result shows, depending on the interaction between the specific regions a firm enters in a more diversified manner, the strategic orientation of an MNE can have a different impact on the use of foreign debt. The use of foreign debt can be regarded as a strategic action in terms of hedging against FX exposure and in the context of credit constraint. It is also influenced by the strategy for geographic diversification and capital market accessibility in addition to FX exposure hedging. Therefore, the heterogeneity of MNEs is more relevant when explaining the effect of MNEs on the use of foreign debt, in opposition to the homogeneity of MNEs. These results are expected to help business managers link the use of foreign debt when establishing and implementing their corporate strategy for globalization. From the academic perspective, this study can provide the basis for researchers to investigate into the relationship between the use of foreign debt and FX exposure management or corporate performance since the results show that that the use of foreign debt could be differently determined by the firm's internationalization and its location specific strategy. Managerial implication of this study is that the managers should consider the main purposes of using the foreign debt in determining the amount of foreign debt use or the specific feature of foreign

debt such as maturity or spread. It is because that a firm needs to manage its foreign cash flow differently depending on the purpose of using foreign debt from the perspective of asset-liability management. To the policy makers in the international finance, the study suggests that they need to consider the firm's internationalization and its strategic concern involved in the location choice when preparing regulations on international debt financing.

The limitation of this study includes the use of single criterion in classifying the world into developed and developing regions. Another limitation can be found in the employment of only two variables 'R&D intensity' and 'credit rating' as proxy for strategic characteristics.

Despite these limitations, this study investigates the determinants of using foreign debt considering MNEs' unique and intrinsic characteristics of heterogeneity and the nature of their strategy. It can be a step forward from the existing studies on the subject, which suggest that MNEs are likely to use foreign currency debt mainly from the prospective of hedging. This study provides another context of different levels of accessibility to capital markets to explain the use of foreign debt by MNEs. Based on these results, future research is expected on the use of foreign debt considering the factors external to the firms as well as their strategic characteristics, and its relation to the FX risk management and corporate performance.

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