

Dear Dr. Amess,

Please find bellow the Phd amendments addressing the points raised in the joint report on the thesis examination.

Kind regards,

Yasmeen Said

Point 1 of the joint report

Provide a clear explanation for why the fixed effects Tobit model is not used.

Addressed as follows in Chapter 1, pages 18, Chapter 2, pages 59, and Chapter 3, pages 101

The above comment is addressed in all three Chapters by discussing why the use of the random effects Tobit model is more appropriate in our study and the disadvantages of using fixed effects Tobit model.

Amendment 1:

Chapter 1

The choice of the random effects Tobit model is appropriate for several reasons. First, by including individual effects, this model can control for firm heterogeneity. Second, since all relevant determinants of debt maturity are included in the regression specification, it is assumed that a possible correlation between unobservable individual effects and the explanatory variables can be ignored (e.g., Affinito and Tagliaferri, 2010). Therefore, we can overcome the potential of serially correlated errors. Lastly, the fact that some of our institutional variables are non-time-varying prohibits us from using fixed effect estimator (Wooldridge, 2002). However, it is important to mention that Honore (1992) suggested an estimator for limited dependent variable models. Honore (1992) mentions that such models are often measured by maximizing a likelihood but would not usually provide the required a properties. The estimator is used to provide a simplified semi-parametric trimmed least squares estimator for fixed effects Tobit models.

We also run robustness checks with the fixed effects model to allow for the possibility of individual effects to be correlated with the regressors and the results are similar to that of the random effects Tobit model. Stephen et al. (2011) use the fixed effects Tobit model in their study of corporate debt maturity choice of Ukrainian joint stock companies. They note that under the circumstance that the firm-specific effects and the explanatory variables are correlated, the fixed effects Tobit model is expected to give reliable results.

Chapter 2

We choose to use random effects Tobit model because by including individual effects, this model can control for firm heterogeneity. In addition, since in our model we include all pertinent determinants of debt maturity, we can presume that a possible correlation between unobservable individual effects and the explanatory variables can be ignored (e.g., Affinito and Tagliaferri, 2010). Hence, the possibility of having serially correlated errors is dealt with. Furthermore, since we include institutional variables that are non-time-varying, this makes fixed effect estimator inappropriate to use (Wooldridge, 2002).

Although we believe the use of random effects Tobit model is more appropriate for our study, we run robustness checks with the fixed effects model to allow for the possibility of individual effects to be correlated with the regressors. The results are similar to that of the random effects Tobit model.

Stephen et al. (2011) use the fixed effects Tobit model in their study of corporate debt maturity choice of Ukrainian joint stock companies. They note that under the circumstance that the firm-specific effects and the explanatory variables are correlated, the fixed effects Tobit model is expected to give reliable results. In addition, Honore (1992) put forward an estimator for limited dependent variable models. This estimator is a semi-parametric estimator for fixed effects Tobit models.

Chapter 3

There are a few reasons to why we use random effects Tobit model in this study. Initially, our model can control for heterogeneity due to the fact that we included individual effects. Subsequently, according to Affinito and Tagliaferri (2010), when all pertinent determinants of debt maturity are accounted for in a model, it is safe to reject the possibility of correlation between unobservable individual effects and the independent variables. In addition, the inclusion of non-time varying control variables in our model excludes the use of fixed effect estimator (Wooldridge, 2002). Nevertheless, Stephen et al. (2011) use the fixed effects Tobit model in their study of corporate debt maturity choice. They suggest that the fixed effects Tobit model is expected to give reliable

results due to the fact that the firm-specific effects and the explanatory variables are correlated.

Point 2 of the joint report

In your data you observe equilibrium borrowing arising from the interaction of supply and demand. It would be useful to acknowledge that a reduced form model is estimated making the parameter of any underlying structural model (an equation for lenders and an equation for borrowers) impossible to identify. This is especially the case for the first and second essays. There is some acknowledgment of supply and demand side factors in the third essay, but it is necessary to be more explicit on this issue on that chapter.

Addressed as follows in Chapter 1, page 11, Chapter 2, page 53, and Chapter 3, page 102

In the 3 chapters, I add explanation to using a reduced form model and what cannot be achieved using such model.

Amendment 2:

Chapter 1

Since our model observes the equilibrium borrowing from the interaction between supply and demand, it is estimated using a reduced form model. This makes the parameters of any underlying structural model impossible to identify. The reduced form equation is produced in terms of variables that may not have their own structural interpretation. We cannot completely separate the demand and supply for loans. However, we study the effect of our control variables on different types of debt borrowing (local and foreign).

Chapter 2

We use a reduced form model to study the equilibrium borrowing arising from the interaction between the supply and demand. Having said that, distinguishing of the parameters of the underlying model becomes difficult. Although it is hard to completely separate the demand and supply for loans, we are able to study the impact of our control variables on different types of debt borrowing, both local and foreign.

Chapter 3

This study observes the equilibrium borrowing arising from the interaction between the supply and demand using a reduced form model estimator. This reduced form model is structured in a way that the variables may not have their own structural explanation. In our model, it is difficult to separate the demand and supply for loans, but we attempt to study how our control variables influence different types of debt borrowing (local and foreign).

We add in Chapter 2, page 53

We estimate a reduced form model to examine the determinants of debt maturity borrowing. Therefore, we cannot identify the determinants of supplying different loans with different maturities. We do not attempt to identify structural (e.g. supply and demand) coefficients from the reduced form, but we focus on the determinants of borrowing maturity in equilibrium.

We add in the Conclusion sections of Chapter 1, page 29, Chapter 2, page 70, and Chapter 3, page 119

Although we have chosen to focus on estimating reduced form model, our results have implications for structural models of multilateral borrowings. Clearly, structural borrowing model could help in explaining the behavior of borrowing in our sample countries and it is possible that fundamentally different models will be required to explain the divergence in our results. Therefore, structural model could be estimated in future work.

Point 3 of the joint report

Given that a reduced-form model is being estimated it is difficult to attribute decreased borrowing to either demand or supply factors. More care is therefore required when interpreting the results. Where only supply-side or demand side interpretations has been made but the model cannot distinguish between supply or demand side interpretations, it is necessary to state both interpretations.

Addressed as follows

In the 3 chapters, there are some statements and suggestions made that are inaccurate since a reduced form model is estimated. These statements are revised and written properly without making false assumptions about the results.

Amendment 3

- P. 23 Firm profitability is negatively related to local currency borrowing as hypothesized. However there is a positive relationship between profitability and foreign currency borrowing. This might be due to profitable firms inclination to borrowing in foreign currency to signal good financial position or perhaps lending institutions might be more willing to lend more to profitable firms.
- P. 25 This might imply that during the crisis firms with growth opportunities avoided borrowing especially in local currency, which makes sense since the Korean won sharply devaluated during the crisis. Nevertheless, this could also mean that lending institutions during that period of time were restricting giving out loans in general.
- P. 63 This could either imply that exporting firms were able to easily borrow in foreign currency and in long-term maturities easier than non-exporting firms or lending institutions preferred giving out loans to exporting firms rather than non exporting ones.
- P. 65 This could imply that highly liquid Korean firms were more inclined to borrow long-term maturity loans or banks were more eager to lend more liquid firms.
- P.107 This might imply that the more the government of a country has in debt either made firms less inclined to borrow in long-term maturities or the lending institutions less reluctant to offer loans with long-term maturities.

- P.107 This result might imply that more politically stable the country becomes, the more the firms were inclined to borrow in long-term maturities. However, it might also imply that when a country is becoming more political stable, the lending institutions could become more trusting and more easily give out loans with long term maturities.

Point 4 of the joint report

In the first and second essays the empirical analysis involves examining empirical relationships pre-during, and post-financial crisis. We assume that the motivation for this is that the candidate expected that the relationship between the independent variables and the dependent variable to change over the financial crisis time line i.e. there is a structural break. Currently, there is not motivation for this. A motivation needs to be provided with an outline of what could be expected. After the financial crisis there was a credit crunch, this will clearly impact on the market for credit. Explain how this could impact on the relationship between key independent variables and the dependent variable.

Addressed as follows in Chapter 1 page 16 and Chapter 2 page 57

I add expectations of how the financial crisis would affect the borrowing patterns of firms.

Amendment 4

We analyse the Korean financial market in three different sample periods: the pre-crisis period which includes years before 1997, the crisis period covering the years 1997-1998, and the post-crisis period that focuses on the years after 1998. The relationship between the independent variables and dependent variable is expected to change in from one period to the other. It is expected that the determinants of borrowing would change from before the crisis to during the crisis.

We expect that during the crisis not all firms can borrow especially in foreign currency. Larger firms with good financial position are expected to have better access to external funds than smaller firms. Firms with more vulnerable financial positions are more likely to be negatively affected by crisis events, and are thus more likely to reduce their borrowing. However, firms that are in the exporting business are expected to have more access to loans during time of crisis.

After the financial crisis, a credit crunch might lead to constricted loan availability for all firms. Therefore, borrowing in either local or foreign currencies would be expected to be limited. Firms became more concerned about their debt exposure and creditors more stringent in their lending and more emphasises would be put on the importance of a carefully chosen maturity-mix of debt to both firms and their lenders

Point 5 of the joint report

More effort should be done to discuss data and present more detailed descriptive statistics. Current draft reports only mean and standard deviation of the key variables. More details should be provided with respect to the dynamics of the dependent variable. Compare your descriptive statistics to those in other key studies to determine similarities and differences in the data set used. If there are differences, suggest possible reasons.

Addressed as followed in Chapter 1 p. 17 and in Chapter 2 p. 58

I discussed further the descriptive statistics especially for dependent variables and compared it to other studies.

Amendments 5

The mean for foreign currency borrowing is 0.089, which is similar to mean value of similar studies (Kim et al. 2015). The mean for local currency debt is 0.369, which is also similar to the mean of South Korean firms in Allayannis et al. (2003). The mean for local currency borrowing dummy is 0.976, which shows that most of the firms in the sample have local currency borrowing, and there will be few zeros. On the other hand, the mean for foreign currency

borrowing dummy is 0.66, which shows that almost 34% of the observations will be zero.

We also report mean and standard deviation values for different time periods (pre-during and post the crisis). For foreign currency borrowing, firms in our sample seem to have higher mean value for borrowing during the post crisis period with value of 0.099 rather than pre crisis period, which is 0.755. However, for local currency borrowing firms in our sample were highly leveraged after the crisis. Mean value for local currency borrowing is 0.370 compared to 0.366 pre crisis. This shows that firms borrowed more in both local and currency borrowing after the crisis period. This pattern of mean values is similar to the results found in similar studies, where firms become more leverage post crisis (Kim et al. 2015). Firms in our sample are a bit more leveraged than firms in similar studies. We believe the reason for that is that our definition of borrowing is foreign/local debt divided by total debt, while some studies use the ratio of foreign/ local debt to total assets.

Chapter 2

The mean for foreign currency debt maturity dummy variable is 0.503, which shows that almost 50% of the firms in the sample have foreign currency borrowing with long-term maturities. This result is similar to the study by Allayanis et al. (2003), which shows mean of 0.508 for South Korean firms in their sample. Moreover, the mean for total borrowing dummy is 0.86, showing that more than 857% of the firms have long-term debt. For control variables (Panel B), the ones with the highest means are firm size, leverage and asset maturity at 16.57, 0.382 and 0.487 respectively.

Table II presents the comparative statistics for foreign currency debt maturity and total debt maturity showing whether or not debt maturity determinants change across sample periods. Therefore, dividing the data into the period before the crisis, crisis period and post –crisis helps us study each period separately. Results show that the mean values for foreign debt maturity and total debt maturity are highest during the crisis at 0.079 and 0.230 respectively. For both types of debt ratios, the mean values drop post-crisis to 0.043 and

0.196, showing that firms had less long-term maturity debt post-crisis. This drop can be because firms did not want to increase the risk of default by borrowing long-term, or banks gave fewer loans in long-term maturity. Our results are similar to results of similar studies.

Point 6 of the joint report

In conclusion, flag up key findings.

Addressed as follows

I rewrote conclusions to have key findings forward and I have moved Chaebol results forward in chapter 1 and 2.

**Corporate borrowing - Currency
denomination, debt maturity and institutional
quality: Evidence from emerging markets**

Yasmeen Hany Said

Thesis submitted to The University of Nottingham
for the degree of Doctor of Philosophy

September 2017

*This thesis is dedicated to the memory of my
grandparents and my forever True North, Shokria El
Badrawy and Hussein El Rashedi.*

*“God looked around his heaven and found empty
spaces, then He looked down upon this earth and
saw your tired faces. He put his arms around you
and lifted you both to rest. God’s heaven must be
beautiful, for he only takes the best.”*

Adapted from poem by D.W.Mcconway

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To the best parents anyone can dream of, thank you for your unconditional support and for the sacrifices you made for me. Thank you for being my source of strength. I would not have been able to do this if it hadn't been for you both.

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To my lovely sister, thank you for always being there for me and for being an example of determination. I learned from the best.

My cheeky children, thank you for being the sweetest and most amazing children anyone can dream of. Thank you for moving to Nottingham with me when deep inside you did not want to and thank you for being my cheerleaders throughout this experience. I am also indebted to my friends in Egypt. Your support meant the world to me. To my friends in Nottingham, thank you all for being my family away from home and cheers for all the support and encouragement and for making this experience so special.

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Abstract

This thesis consists of 3 empirical papers examining the capital structure and debt maturity determinants from a developing economy perspective. Chapters 1 and 2 focus on firm-level determinants of local currency and foreign currency borrowing in South Korea over the period 1990 - 2006, which includes the 1997-1998 Asian financial crisis. Chapter 3 conducts a cross-country analysis using a dataset from the Middle East and Africa region (MEA hereafter) to study the firm level and institutional environment effects on debt maturity choices.

The first chapter uses capital structure theories to investigate whether there are common factors affecting both foreign and domestic currency denominated debt in South Korea. The dataset used includes 18,827 observations for 4017 listed and unlisted manufacturing firms. As not all firms have both types of debt (local and foreign), our debt ratios dependent variables contain a good proportion of zero values, which motivates the use of the random effects Tobit model. We find that firm size, profitability, liquidity, asset tangibility, and leverage are common determinants for foreign and local currency borrowing including. We also find that the effect of certain capital structure determinants changed from one period to another.

The second chapter examines the determinants of foreign currency corporate debt maturity in South Korea. The chapter relies on both debt maturity and foreign currency debt theories. The dataset includes 4,066 manufacturing firms observed over the period 1990-2006. Since the debt maturity dependent variable contains a large proportion of zeros due to the fact that many firms do not have long-term debt, the random effects Tobit model is utilized. Our findings suggest that debt maturity decisions of Korean firms are dependent on firm-specific variables, which lend support to both debt maturity and foreign currency debt theories.

The third chapter uses insight from institutional theories to examine the influence of institutional quality on corporate debt maturity choices in the MEA region. The dataset covers annual information for 1,163 firms from 21

countries observed over the period 2006-2014. We separate the Arab Spring countries from the rest of the MEA countries to test whether institutional quality has a different effect on debt maturity structure given the cross-country corporate environment variations. Our random effects Tobit model results suggest that elements of countries institutional environment and lending infrastructure prove influential to the debt maturity choices for the MEA region firms.

Introduction

Since 1958, when Modigliani and Miller published their prominent body of literature on the determinants of capital structure, the subject has been the centre of attention in an attempt to answer the important question of “How are firms financed?” Motivated by prior literature and the importance of having well-structured financial firms, this thesis consists of three empirical papers examining the capital structure and debt maturity determinants from a developing economy perspective.

The first empirical paper analyses the determinants of corporate debt issuance while paying special attention to the currency denomination of debt. The main contribution of this paper is to relate capital structure theories to the analysis of foreign and local currency borrowing in order to find the differences and commonalities in the determinants of issuing debt in a different currency (foreign currency debt and domestic currency). We use multivariate tests to study the degree to which different capital structure theories including the trade-off, pecking order, signaling, agency, and risk management theories can explain local and foreign currency borrowing.

The analysis employs a rich panel dataset of South Korean manufacturing firms observed over a long time period from 1990 to 2006. Our sample includes 18,827 observations for 4017 listed and unlisted firms. Our dataset has detailed information about a firm’s holdings of foreign versus local currency borrowing, its export status, and whether or not a firm is part of a large conglomerate (chaebol). Since the dependent variables are ratios of debt, and not all firms have both types of debt, local and foreign, a good proportion of the observations will be zero. Therefore, we use the random effects Tobit model

Since the financial crisis period is included in the time frame tested, we are able to use the 1997-1998 East Asian financial crisis as a natural platform to study how firms choose the currency denomination of debt, local or foreign currency. We analyse the Korean financial market in three different sample

periods: the pre-crisis period, which includes the years before 1997, the 1997-1998 crisis period, and the post-crisis period covering the years after 1998.

Our results show that determinants of foreign currency borrowing and local currency borrowing in Korea are in line with the theoretical predictions of capital structure theories. This study shows that in order to be able to borrow, Korean firms must be big, well leveraged and have enough tangible assets to present as collateral. In addition, firms that are profitable and that are in the exporting business are able to gain access to foreign currency borrowing. When analysing the data during different time periods, we find that during and post the crisis periods only highly leveraged firms had access to foreign currency borrowing. In addition, we find that profitable firms are less inclined to borrow in foreign currency during the crisis in order to avoid any information asymmetry. Both firm size and asset tangibility show positive and significant effect on foreign currency borrowing pre, during and post crisis.

This paper, to the best of the author's knowledge, is among the few papers studying the South Korean debt market independently from other East Asian markets and investigating their borrowing schemes, pre-, during and post crisis from a capital structure theories' perspective. In comparison to prior work, our analysis uses a larger dataset covering a broader time span. For example, Allayannis et al. (2003) employ a dataset comprising of only 327 East Asian corporations, including 30 South Korean firms, observed over the period 1996-1998.

The second empirical paper studies the determinants of debt maturity taking into account the currency denomination of debt. This is important because having a well-structured borrowing structure can help a) avoid liquidity risk by aligning a firm's asset structure with its debt maturity structure; (b) address agency problems; (c) signal quality of earnings of a firm; (d) enhance flexibility in financing; and (e) reduce cost of financing and refunding risk.

This paper aims to identify the determinants of the maturity structure of both total debt (local and foreign) and of corporate debt denominated in foreign currency. The paper relates both to the strand of the literature on debt maturity structure and also to the literature stream on foreign currency borrowing. The analysis focuses on a developing financial market, South

Korea, and uses a cross-sectional dataset of 4,066 manufacturing firms. The period tested is from 1990 to 2006, which spans the East Asian financial crisis period, allowing us to capture the effect of the crisis on the determinants of debt maturity (both total and denominated in foreign currency).

We use the random effects Tobit model due to the fact that the dependent variables are ratios of debt maturity and many firms do not have long-term debt. Our findings suggest that debt maturity decisions for Korean firms are dependent on firm-specific variables, which include firm size, leverage, quality and asset maturity. The results lend support to both debt maturity and foreign currency debt theories. This paper is one of the few papers to reconsider and examine debt maturity structure, especially of foreign currency debt in an emerging market framework, as previous debt maturity studies usually focused on developed countries. It provides one of the initial evidence on the determinants of foreign currency debt maturity before and after the Asian financial crisis in Korean manufacturing firms.

The third empirical paper differs from the previous two papers in that it tackles the issue of how a firm's financing decisions depend - apart from the firm's internal characteristics - on the institutional environment in which it operates. Driven by the growing body of literature on the importance of a country's institutional quality, we examine the influence of institutional quality on corporate debt maturity choices in our analysis of what shapes corporate borrowing in the Middle East and Africa (hereafter MEA) region.

While previous work has mostly focused on developed economies, we concentrate on the MEA region in an attempt to add to the restricted number of studies on emerging markets because the fundamental economic mechanisms are typically underdeveloped. First, we investigate whether the debt maturity structure decisions in MEA countries depend on the same firm-level factors as those identified in other parts of the world, specially developed economies. Second, we aim to study the extent to which variations in the quality of the countries' institutions can explain cross-country differences in capital structure and debt maturity choices in the politically feeble MEA region. Third, for the first time in literature, this paper aims to add lending infrastructure as part of the institutional settings and examine its effect on corporate borrowing choices in MEA region. In addition, we separate the Arab Spring countries from the

rest of our sample of MEA countries and test whether institutional quality and environment have a different effect on debt maturity structure given the cross-country corporate environment variations. We separately study the Arab Spring countries in the sample before and after the formation of the Arab spring to see the effect of the 2011 revolt and political uprising on debt maturity choices.

Our sample includes firms from 21 countries in the MEA region. Firm-level data is obtained from DataStream, and country level data is gathered from the Database of World Bank. The data covers annual information over the period 2006-2014 and includes 6,408 observations for 1,163 firms. We use the random effects Tobit model due to the fact that the dependent variables are ratios of debt maturity and not all firms have long-term debt.

This contribution of this paper stems from studying the interaction between national country factors and enterprise level organizational strategies specifically from a political status point of view. To the best of the author's knowledge, this is the first multi-country paper to study corporate debt maturity with emphasis on the different political environment in the MEA region. This study is related to previous work on the region but differs in several respects. Our sample includes firms located not only in North Africa but also in most countries in the Middle East and Africa area. For example, Awartani et al. (2016) uses a dataset from the Middle East and North Africa region only and includes only 10 countries from the region for the period 2003-2011. Our sample includes 21 countries in the MEA region covering a large period of time (2006-2014). Furthermore, since our sample spans the 2011 Arab spring formation, our paper is one of the first works to study institutional environment effects on debt maturity for the Arab Spring countries.

The structure of the thesis is organised as 3 self-contained empirical chapters followed by the thesis conclusion.

Chapter 1

Determinants of foreign currency borrowing versus domestic currency borrowing: Evidence from Korea

Abstract

This paper aims at studying the determinants of issuing foreign currency debt and domestic currency debt in Korea. We test whether there are commonalities between the factors that affect foreign currency and local currency borrowing from the standpoint capital structure theories. Focussing on a wide time frame from 1990 to 2006, which includes the Korean financial crisis, we are able to capture the effect of the crisis on the determinants of capital structure and analyse how they change over time. We find that there are common determinants for foreign and local currency borrowing including firm size, profitability, liquidity, asset tangibility, and leverage. We also find that certain capital structure determinants have a different effect on borrowing before the crisis versus after the crisis including profitability and export status. Our results show that determinants of foreign currency borrowing and local currency borrowing in Korea are in line with the theoretical predictions of capital structure theories.

1.1. Introduction

For decades the subject of capital structure has been the centre of attention due to its valuable importance in the achievement of well-structured firms. (Modigliani and Miller 1958). Studies on the determinants of capital structure have often focused on achieving optimal leverage ratios and realizing the best combination of debt and equity. This paper mainly focuses on the debt (borrowing) side of the firms' capital structure. Debt is a vital part of the capital structure of corporations, and it is essential to study the factors affecting firms' debt holdings in both local and foreign currency. One important question to ask is: Why would firms in emerging markets issue foreign debt? This merely could be because they wish to reach international markets that are characteristically deeper and more liquid, or the domestic lending markets possess fewer benefits compared to foreign ones. Rajan and Zingales (1995) and Booth et al. (2001) state that firm characteristics play an important role when deciding to issue debt. Goldstein and Turner (2004) believe that it is loopholes in the domestic economies' policies and financial systems that drive issuers offshore. Moreover, Mizen et al. (2012) explain that "there is no one-size fits all template" for the decision on whether to issue debt domestically or in a foreign market.

Therefore, this paper attempts to investigate the determinants of debt borrowing. The main purpose of this paper is to relate capital structure theories to the analysis of foreign and local currency borrowing. Since the financial crisis period is included in the time frame tested, we are able to use the financial crisis in East Asia in 1997 as a natural platform to study how firms come to a decision to borrow either in local or foreign currency. We analyse the Korean financial market in three different sample periods: the pre-crisis period which includes years before 1997, the crisis period covering the years 1997-1998, and the post-crisis period that focuses on the years after 1998.

South Korea is believed to be one of the countries that was severely affected by the crisis, therefore, it is interesting to separate it from the East Asian economies and analyse it separately. We aim at finding the determinants of foreign currency borrowing versus local currency borrowing and find whether there are mutual determinants. Our findings suggest that there are common determinants of both local and foreign currency borrowing. The main variables

that show significance for both types of borrowings are firm size, leverage, liquidity, profitability, asset tangibility and export status. The variable that only has significant effect on local borrowings is growth opportunities while firm age is significant only for foreign currency borrowing.

The dataset utilised is from the KIS-Value Database (Korean Information Service). It includes information about firms' financial statement data maintained by the Korea Information Service. Data used is from 1990 to 2006. We use random effects Tobit regression model to analyse our dependent variables, which are the ratios of foreign currency borrowing to total liabilities and local currency borrowing to total liability in Korean manufacturing companies.

Theoretical studies usually focused on the two opposing theories: trade-off and pecking order theories. Trade-off theory suggests that there is no optimal capital structure and that a firm usually puts a certain debt level as a target and tries to achieve it. It also states that firms face a common trade-off between tax advantage of debt, bankruptcy costs and agency costs (Miller 1977; Jensen and Meckling 1976; Kraus and Litzenberger 1973). Pecking order theory, on the other hand, states that firms prefer retained earnings to external funds, and then they resort to the debt borrowings followed by the equity financing as a last option (Myers and Majluf 1984). This study not only focuses on analysis from trade-off and pecking order theories, but it also utilizes analysis from agency theory, signaling theory and risk management theory.

Our dataset is considerably richer than the datasets used in the past as it is quite large and includes 18,827 observations for 4017 listed and unlisted firms. We also have a broader time span to analyse in comparison to previous papers. For example, Allayannis et al. (2003) analyse the borrowing structure of only 327 firms from East Asia over the period of just two years from 1996 to 1998. Moreover, our dataset has firm-level information on the export status of Korean firms, their holdings of foreign versus local currency borrowing and whether or not a firm is part of a large conglomerate (chaebol).

The next part of the introduction discusses briefly the Korean financial market during the time periods tested, and the rest of the paper is organized as follows. Section 2 provides the literature review. Section 3 includes the model, and section 4 explains the independent variables. Section 5 provides the data

and descriptive statistics while section 6 outlines the methodology used. Section 7 presents the results with marginal effects. Section 8 is the robustness checks, and section 9 is the conclusion.

1.1.1. Korea in Crisis

Although it might have seemed that the Korean financial market was flourishing and well integrated into the world market, the Korean economy experienced a great hit as the won sharply dropped in value in December 1997 (Wade and Veneroso 1998). One reason for that was that the International Monetary Fund (IMF) plan which was signed to give Korea a three year stand-by-credit was not dealt with seriously by the government, and there were doubts about its implementation (Kwack 1998). Moreover, a huge portion of foreign debt build-up was in short-term and foreign-currency denominated bank loans. By the end of 1997, the value of non-performing loans of local banks in South Korea was 16 percent, which was the highest in the region, and accordingly very difficult to deal with (Kwack 1998). The ratio of short-term foreign liabilities to foreign reserves, which is a widely used indicator of currency and financial fragility, was more than 100 percent in Korea (Eichengreen and Hausmann, 1999). Furthermore, Korean firms were issuing foreign debt in great measures around the time of the crisis, as foreign liabilities increased from US \$45 billion in 1993 to US \$116 billion in 1997 and net debt reached US \$80 billion in 1997 (Corsetti et al., 1999). Therefore, we have decided to study the Korean debt market separately.

Second, around the same time of the crisis, there was the presidential elections that brought wide policy uncertainty. According to Corsetti et al. (1999), the influence of the presidential campaign and the inconsistent signals sent by the candidate Kim Dae Jung (and ultimately President-elect), as well as the intimidation of labour unrest were all the influences that further amplified the effects of the crisis and prompted investors (domestic and foreign investors) to exit the market.

The existence of Chaebols (highly influential and large conglomerates) and their privileges added to the problems during the crisis. Chaebols controlled the private banks in Korea, and thus these big firms had advantaged access to credit, which aggravated the moral hazard problem (Kwack 1999). Assuming

that the government would always come to their rescue to avoid bankruptcy, these large firms took too much risk and thought they were too large to collapse (Chang 2000). Hence, the Korean financial system was a true disaster because of enormous lending to large corporations, a few of which went bankrupt early 1997 (Borensztein and Lee 2002).

The Korean economy was able to quickly recover from the crisis, as the Korean government was eager to improve the financial situation fast and did not wait for the financial market to stabilize on its own (Koo and Kiser 2001). What set Korea apart from the other recovering countries was the fact that the Koreans had a sense of national persistence and a great willingness to sacrifice personal comfort for the sake of a greater good. This was obvious in Koreans' tolerance to severe adjustments in the labour market, which gave the government the social stability it needed in a recovery period (Koo and Kiser 2001). The main reason for the rapid recovery was the IMF bailout. The initial signs of recovery took place about a year after the crisis as the currency appreciated, and then as a result of easing the monetary policies, the stock market gained its strength. Although the Korean financial market took a massive hit in the Asian financial crisis, the government intervention to resolve the banking sector collapse, in addition to fine tuning of capital and equity market helped quicken the recovery.

Having discussed the situation in Korea around the time of the financial crisis, we would like to study the Korean financial market during pre crisis period, crisis period and post crisis period while especially focusing on analysing the determinants of loan borrowings. We study the determinants of foreign currency borrowing and local currency borrowing to examine whether or not the determinants differ. We do so by relating the determinants to theoretical predictions from the from capital structure theories.

1.2. Review of the theory

This paper aims to study the determinants of foreign currency borrowing and local currency borrowing and test whether or not they have commonalities using the standpoint of capital structure theories. There are numerous empirical studies that tested capital structure theories using samples of U.S. firms. Even though analyses differ, there are formalised specifics that emerged. For

example, Harris and Raviv (1991) determine that debt use is directly related to fixed assets, non-debt tax shields, investment levels, and firm size while it is inversely related to growth opportunities, the probability of bankruptcy, profitability, and uniqueness of the product. There are also non-U. S. firm papers such as the ones by Rajan and Zingales (1995) that analyse G-7 countries and Booth et al. (2001) that examine developing countries, which conclude that there are similar influences that affect firm debt ratios both in developed and developing countries. It is vital to point out that the explanation of empirical findings is still a deliberation and that many control variables can be used as proxies for factors in competing models (Allayannis et al., 2003).

Meanwhile, subsequent results show that capital structure determinant, firm size, is often positively related to a firm's leverage. In addition, debt ratios are lower for more profitable firms and those with high market-to-book ratios. Furthermore, debt use is commonly higher for firms with more tangible assets as they can be considered collateral for the loans (Huang and Song 2006).

In the subsequent section, we discuss the predictions of each capital structure theory in relation to currency denomination of debt; then we give the theoretical background of the theory in general and present some hypothesis based on the related theory and previous evidence.

1.2.1. Trade-off and the currency denomination of debt

Under the trade-off theory, foreign currency and domestic currency borrowing are considered to be substitutes (Allayannis et al., 2003). Trade-off theory is related to the determinants of both domestic and foreign currency borrowing, as Mizen et al. (2012) state that according to trade-off theory, firms increase total debt, use in both local and foreign currencies in order to make use of the cost advantages. These cost advantages may be a result of the tax treatment or the level of interest rates.

Originally, Kraus and Litzenberger (1973) give the orthodox statement of the theory of trade-off, which states that optimal capital structure shows a trade-off between the tax advantage of debt and the deadweight costs of bankruptcy. Miller (1977) agrees that firms hold high levels of debt to take advantage of the tax shield. However, another point of view questions the worthiness of the benefits of the tax shield. Myers (1984) points out how firms

just need to reach the combination of debt and equity that would optimise firms' value. Long and Malitz (1985) and Barclay et al. (1995) prove that under trade-off theory, growth and leverage are negatively related. Moreover, Frank and Goyal (2005) make correlations between different factors relating to debt-ratio and leverage. These factors include growth opportunity, firm size, the tangibility of assets, and profitability. They find that leverage is positively related to firm size and tangibility of assets; however, the relations between leverage and profitability show ambiguity in results. Given the theoretical background, the benefits of the tax shield should increase with a firm's profitability.

Hypothesis 1: Therefore, we hypothesise that a firm's size and a firm's profitability should have a positive relation to leverage while growth opportunity should have an inverse effect on debt ratio both for local and foreign debt.

1.2.2. Pecking order and the currency denomination of debt

According to Allayannis et al. (2003), the pecking order hypothesis may explain the ideal currency denomination of debt issuing and show that it depends on domestic (local) investors having better information about the firm than foreign ones. In addition, they suggest that firms will first choose domestic debt and then move to foreign debt. Consequently, the relationship between profitability and leverage is stronger for domestic currency debt, and profitability is expected to be negatively related to local currency debt ratio. Unlike, the trade-off theory, the pecking order theory implies that foreign currency debt use is a complement to domestic currency debt.

Primarily, Myers and Majluf (1984) show that investors are eager to buy risky securities only at a low price due to the information asymmetry between managers and investors. The pecking order theory entails that companies are always disinclined to issue shares. Hence, according to Myers (1984), if a firm prefers to use internal funds (retained earnings) to external financing, and chooses debt financing over equity if external financing is used, then it is following a pecking order. In addition, Lee (1997), and Heaton (2002) blame the preference of debt to equity investment on the unrealistic expectations of

managers who believe that their stocks are undervalued. The Pecking order theory is not a strict alternative to the trade-off theory; therefore, a company can choose to follow the trade-off theory but focus on debt financing rather than on issuing new stocks.

Frank and Goyal (2005) study the relationship between leverage and growth opportunity, firm size, tangibility of assets and profitability. They find that under the pecking order theory growth opportunities and leverage are positively related; however, leverage and firm size are negatively related.

Hypothesis 2: We hypothesise that if our results follow pecking order theory, firm size and profitability are expected to be negatively related to leverage.

1.2.3. Agency theory and the currency denomination of debt

Under the agency theory and the conflicts that arise from information asymmetry, the monitoring cost is what determines the currency of debt, whether local or foreign. According to Diamond (1984), when local creditors can collect enough information on local firms at low cost, firms that have high monitoring expenses are better off resorting to local borrowing than to foreign. Moreover, since information asymmetries that lead to agency problems will be low for larger firms with greater growth opportunities, then these firms may receive more lenient borrowing rules and be more inclined to borrow from local creditors (Allayannis et al., 2003).

Jensen and Meckling (1976) explain that agency relations occur when a person (principals) appoints another person (the agent) to complete a job. Since principals normally give the agent the authority to make a decision, the difference between the information that the principal and agent know is what causes an agency problem. According to Allayannis et al. (2003), information asymmetry can lead to monitoring costs due to the fact that managers and shareholders have different sets of information; hence, the shareholders or prospective investors need to carefully monitor the firm's activities. Therefore, under the agency theory, there are some assumptions about the constituents of a firm's capital structure. For example, a firm's tangible assets and debt will most likely have a positive relation. Since tangible assets act as collateral for

loans, they can be used to decrease agency costs of debt (Allayannis et al., 2003).

Hypothesis 3: We hypothesise that there is a positive relation between asset tangibility and the level of foreign currency debt and a negative relation to local currency debt.

1.2.4. Signalling theory and the currency denomination of debt

Signaling is when the firm's management decisions offer clues to investors about how managers view the firm's future financial well-being (Besley and Brigham 2005 p.402). Therefore, when companies decide to take loans, it can be interpreted by investors that managers are signaling confidence in future cash flows that are expected to be generated by the business's investments. According to the pecking order, good quality firms usually use internal funds to avoid adverse selection problems and losing value. These firms cannot signal their quality by changing their capital structure. In signaling theory, the capital structure acts as a signal of private information (Ross, 1977). Heinkel (1982) creates a signaling equilibrium model to show that investors should look at the capital structure of a firm when trying to set specific expectations about that firm. Hovakimian et al. (2001), in addition, explain that firms issue stocks after stock prices increase, which shows the information (signaling) role through the simultaneous changes in a firm's capital structure and market value.

Signaling theory also provides explanation for the use of foreign debt versus local debt. According to Titman and Trueman (1986), managers could decide to acquire debt from a trustworthy or high-quality lender (even foreign) to signal that their firms are credible and are of high-quality performance to investors. Ross (1977) has projected the idea that although some firms still borrow in spite the fact that it is expensive for firms to use foreign capital (due to inspection and distress costs), they may be doing so to signal their credit-worthiness by accepting these extra costs. Allayannis et al. (2003) confirm that firms that have established a reputation in foreign markets will be more inclined to borrow in foreign currency. The empirical prediction is that a firm's profitability is positively related. The evidence, however, is ambiguous. Most

empirical studies report a negative relationship between leverage and profitability as discussed earlier.

Hypothesis 4: Under the signaling theory, we hypothesise that firm profitability is negatively related to local currency borrowing. Moreover, we expect that profitable firms are the ones more likely to borrow in foreign currency to signal good financial value.

1.2.5. Risk management theory

One concern that accompanies the use of foreign currency debt is a firm becoming more exposed to exchange rate movements and ending up financially frail (Eichengreen and Hausmann 1999). Therefore, some firms will want to reduce this exchange rate risk. Using data from Australia, New Zealand, and other South-East Asian countries, Esho et al. (2001), find that the demand for hedging is one of the most important factors making firms issue foreign currency debt. The theory assumes that when firms are able to decrease exchange rate risk, they are more prone to use foreign currency debt (Graham and Rogers 2002). Firms with higher foreign sales, use more foreign currency debt since foreign revenues provide a natural safety net against the exchange rate movements.

Hypothesis 5: We expect firms with export sales to have more foreign currency denominated debt than the firms that do not have exports.

1.3. Empirical model

We study the determinants of domestic and foreign currency denominated debt using hypotheses from capital structure theories to estimate the following baseline model.

$$\begin{aligned} DEBT_{i,t} = & \beta_0 + \beta_1 SIZE_{i,t} + \beta_2 GTH_{i,t} + \beta_3 LEV_{i,t} + \beta_4 LIQ_{i,t} \\ & + \beta_5 PROFIT_{i,t} + \beta_6 AGE_{i,t} + \beta_7 TANG_{i,t} + \beta_8 EXP_{i,t} + \mu_i \\ & + \mu_i + \varepsilon_{i,t} \end{aligned}$$

where $DEBT_{i,t}$ refers to two debt ratios: the ratio of foreign currency denominated debt to total liabilities and the ratio of local currency denominated debt to total liabilities. The control variables refer to capital

structure theories and foreign currency borrowing and include firm size ($SIZE_{i,t}$) measured as logarithm of total assets; growth opportunity ($GTH_{i,t}$) measured as change in log sales between t and $t-1$; firm leverage ($LEV_{i,t}$) measured as lagged value of total liability to total assets; firms liquidity ($LIQ_{i,t}$) measured as current assets divided by current liabilities; firm profitability ($PROFT_{i,t}$) measured as operating income divided by total sales; firm age ($AGE_{i,t}$) which is Ln of number of years since firm's establishment; tangibility of assets ($TANG_{i,t}$) measured as the ratio of tangible assets to total asset; firm's export share ($EXP_{i,t}$) measured as the ratio of export sales to total sales. The subscript i denotes firms in the sample and the subscript μ_t refers to time dummies to capture the latent changes in the general economic environment. Moreover, μ_i refers to industry dummies, which is a two-digit (SIC code) industry dummy used to control for industry-specific effects for 22 industry subgroupings available in the data. Finally, $\varepsilon_{i,t}$ denotes the error term.

Since our model observes the equilibrium borrowing from the interaction between supply and demand, it is estimated using a reduced form model. This makes the parameters of any underlying structural model impossible to identify. The reduced form equation is produced in terms of variables that may not have their own structural interpretation. We cannot completely separate the demand and supply for loans. However, we study the effect of our control variables on different types of debt borrowing (local and foreign).

1.4. Discussion of independent variables versus theory

The variables discussed in this section relate to different theories and are used as control variables to help analyse the determinants of foreign and local currency borrowing. They include firm size, growth opportunity, leverage, liquidity, profitability, firm age, asset tangibility, and exporting status. Table AI in the appendix includes a list of the independent variables that are used in the analysis.

Firm size is measured as Ln of total assets. Several theoretical studies, including Harris and Raviv (1990) and Stulz (1990), propose that there is a positive relation between leverage and size. Keloharju and Niskanen (2001) claim that large firms are usually well known to the financial institution and so their reputation would help them have easier access to international capital markets than small firms. Furthermore, studies on foreign currency borrowing determinants such as those by Aabo (2006) and Kedia and Mozumdar (2003) that examine the factors shaping why firms issue foreign find that firm size has a positive and significant effect on foreign debt issuance. They add that smaller firms would find it more costly to set up foreign debt instrument and so would be less inclined to borrow in foreign currency. Other empirical studies such as Rajan and Zingales (1995) and Booth et al. (2001) also find a positive correlation between leverage and firm size.

In relation to the capital structure theories, trade-off theory predicts that larger firms have more debt since they are more diversified and have lower default risk than small firms. Since firm size is positively related to leverage (debt ratio), it could have the same effect on debt denominated in foreign currency. According to Keloharju and Niskanen (2001), who use a sample of the 44 listed Finnish firms during the period 1985- 1991, larger firms have higher access to international debt markets, and therefore are more inclined to issue foreign currency denominated debt.

Pecking order theory supports an opposite relation between firm debt level and firm size. The reason is that large firms have existed usually in the market longer than small firms and have lower adverse selection costs; therefore, they can more easily issue equity (Frank and Goyal 2005). This study uses the financial market of Korea to test whether the relationship between firm size and different debt ratios follow a pecking order or trade-off hypothesis.

The logarithm of total assets as a measure of firm size is used following several studies including Kedia and Mozumdar (2003), Hagelin and Pramborg (2004), Chiang and Lin (2005), Aabo (2006), and Nandy (2010). All these studies find a positive relation between firm size and foreign debt use.

Growth opportunities variable is measured by change in log sales between t and $t-1$. Generally, theoretical studies support that firms with growth opportunities might have faced a harder struggle to raise external funds and

forecast a negative relation between leverage and growth, which is also in line with static trade-off theory. Myers (1977) states that the underinvestment problem is huge for firms with growth opportunities, which makes firms with growth potential less inclined to issue debt. The underinvestment problem happens when firms are less reluctant to invest in low-risk assets in order to increase shareholder wealth at the expense of the debt holder. Furthermore, Keloharju and Niskanen (2001) explain that firms expecting growth opportunities will be inclined to decrease the volatility of future cash inflows and potentially evade underinvestment issues.

Myers and Majluf (1984), in support of pecking order theory, expect firms with greater growth opportunities to assign primacy to internally generated resources over debt issuance. Similarly, *agency theory* also predicts a negative relation between leverage and growth, as for firms with fewer growth opportunities having debt helps in lowering agency costs for managers as proposed by Jensen (1986). Following the *agency theory*, Allayannis et al. (2003) clarify that the likelihood of agency costs arising are greater for firms with growth opportunities, leading to less borrowing (foreign or domestic).

Leverage is measured as lagged value of total liability to total assets and *Liquidity* is measured as current assets divided by current liabilities. Both are used as proxies for financial position of firms. Debt ratio (leverage) has been used as a measure of financial distress and is found to be positively related to foreign debt use (Keloharju and Niskanen (2001); Aabo (2006)). Therefore, this work measures the financial position of a firm using leverage ratio.

According to trade-off theory, firms with less debt (foreign debt) have a lower probability of bankruptcy; thus, they will be less willing to borrow in local or foreign currency. Kraus and Litzenberger (1973), claim that optimal leverage is a reflection of a trade-off between the tax benefits of debt and the deadweight costs of bankruptcy. Following Pecking order theory, Myers and Majluf (1984) state that firms prefer to first use internal financing then they resort to external debt, and then move to external equity. However, firms operating in different countries are forced to deal in foreign currency, so they are inclined to issue foreign debt, to protect their financial position and avoid bankruptcy. Furthermore, according to Bougheas et al. (2014), firms with higher leverage have a greater possibility of borrowing in foreign currency

(positive relation) and firms with higher liquidity are less inclined to borrow in foreign currency (negative relation).

Profitability is measured using operating margin, which is operating income divided by total sales. A strand of theoretical literature discusses that the highly renowned profitable firms are granted easier access to external funds, which encourages them to issue debt. According to Frank and Goyal (2005), trade-off theory suggests that firms that generate more profits should have more debt because predictable bankruptcy costs are low for such profitable firms. The sign of the profitability variable, in this case, would be positive in relation to foreign debt use.

On another note, Allayannis and Ofek (2001) stress that more profitable US firms generate internal funds easier and cheaper than less lucrative firms; thus, they are not motivated to use foreign currency debt. Pecking order theory argues that firms favour internal finance over an external one. In the situation when investments and dividends are fixed, more profitable firms will issue less debt. Accordingly, Gatopoulos and Louberge (2013) argue that profitability lessens foreign debt use considerably. Many of the empirical studies claim that leverage and profitability are inversely related including Titman and Wessels (1988), Rajan and Zingales (1995), Booth et al. (2001) and Huang and Song (2006). It seems like the profitability variable might have a different effect on local debt use than on foreign debt use. Consequently, this paper tests whether the relationship between different debt ratio and profitability for Korean firms follows the trade-off or pecking order theory.

Firm Age is measured as Ln (number of years since establishment). The theoretical relationship between firm age and leverage is still not crystal clear. Trade-off and agency theory suggests that there is a positive relationship between firm size and leverage. It supports the idea that firms that existed longer in the market would have formed relationships with the lender and a reputation that would facilitate borrowing (Ezeoha and Botha 2012). On the other hand, pecking order suggests that there is a negative relationship between age and leverage. It argues that older firms would have enough retained earnings for doing business for a long time and would not need to use external funds, debt or equity (Peterson and Rajan 1994).

Asset tangibility is measured as the ratio of tangible assets to the total asset. More tangible assets are related to a greater use of long-term debt financing. According to Jensen and Meckling (1976) and Jung and Kim (2008), tangible assets provide better collateral for firm borrowings and, therefore, firms with more tangible assets can borrow more or have higher debt ratios. Mizen et al. (2012) include a measure of tangible assets as a proxy for the firm's capability to secure collateral for debt finance, using a ratio of tangible assets to total assets. They also add that since investors (both foreign and domestic) have a constrained ability to monitor the firm and gather enough information, the existence of tangible assets may indicate that there are sufficient resources to relinquish in the case of default. Therefore, as an indicator for firms' collateral holdings and good asset structure, the ratio of tangible assets to total assets is used.

Both the trade-off and pecking order predict a positive relation between debt ratio and tangibility of assets. Empirical studies such as Rajan and Zingales (1995) and Huang and Song (2006) support the positive relation between tangibility of assets and leverage.

Exporting Status is measured as the ratio of export sales to total sales. This ratio allows for comparison between exporting and non-exporting firms and helps analyse whether or not a firm's exporting status affects its capital structure composition. Bougheas et al. (2014) use the same data as ours to test whether exporting firms suffer as much or differently from non-exporting firms during the financial crisis. They state that exporting firms tend to have a financial advantage over non-exporting firms in a time of crisis. The reason behind that is that exporting firms' have foreign revenue streams which act as collateral to foreign banks. Analysing the Korean market, they discuss that the devaluation of the local currency affects firms in two different ways. First, the depreciation of the currency amplifies production costs because the imported inputs would be more costly after the devaluation. Second, the firm's competitiveness is affected by the devaluation, meaning that exporting firms will have a competitive advantage, as the devaluation makes exports less costly and increases creditworthiness for exporting firms.

According to *Risk management theory*, firms that have exchange rate risk are more prone to use foreign currency debt to try to eliminate that risk.

Particularly, firms with higher foreign sales are more inclined to use more foreign currency debt since foreign revenues provide protection against exchange rate movements (Geczy et al., 1997, Graham and Harvey 2001).

1.5. Data and descriptive statistics

In this section, we discuss the dataset used in our analysis. Our data comes from the KIS-Value Database and it includes information about firms' financial statement data maintained by the Korea Information Service. The analysis focuses on firms from the manufacturing sector and covers the period from 1990 to 2006. The dataset is considerably rich, as it includes 18,827 observations for 4,017 listed and unlisted firms. The dataset also facilitates comparison between exporting and non-exporting firms. We winsorize 1% of the observations to limit extreme values and reduce the effect of spurious outliers. It is quite a large dataset in comparison to Allayannis et al. (2003) dataset, which has only 327 firms in total and only 30 Korean firms. We use multivariate tests to study variables representing trade-off, pecking order, signaling, agency, and risk management and distinguish dissimilarities and commonalities between determinants of local and foreign currency borrowing.

We analyse the Korean financial market in three different sample periods: the pre-crisis period which includes years before 1997, the crisis period covering the years 1997-1998, and the post-crisis period that focuses on the years after 1998. The relationship between the independent variables and dependent variable is expected to change in from one period to the other. It is expected that the determinants of borrowing would change from before the crisis to during the crisis.

We expect that during the crisis not all firms can borrow especially in foreign currency. Larger firms with good financial position are expected to have better access to external funds than smaller firms. Firms with more vulnerable financial positions are more likely to be negatively affected by crisis events, and are thus more likely to reduce their borrowing. However, firms that are in the exporting business are expected to have more access to loans during time of crisis.

After the financial crisis, a credit crunch might lead to constricted loan availability for all firms. Therefore, borrowing in either local or foreign currencies would be expected to be limited. Firms became more concerned about their debt exposure and creditors more stringent in their lending and more emphasises would be put on the importance of a carefully chosen maturity-mix of debt to both firms and their lenders.

1.5.1. Descriptive statistics

This section includes the descriptive statistics and correlation coefficient of the independent variables for the whole sample period. Table I Panel A shows the mean and standard deviation for the dependent variables and independent variables as well as dummy variables for foreign currency borrowing and local currency borrowing, which take the value 1 if a firm has foreign or local currency and 0 otherwise. The mean for foreign currency borrowing is 0.089, which is similar to mean value of similar studies (Kim et al. 2015). The mean for local currency debt is 0.369, which is also similar to the mean of South Korean firms in Allayannis et al. (2003). The mean for local currency borrowing dummy is 0.976, which shows that most of the firms in the sample have local currency borrowing, and there will be few zeros. On the other hand, the mean for foreign currency borrowing dummy is 0.66, which shows that almost 34% of the observations will be zero.

We also report mean and standard deviation values for different time periods (pre-during and post the crisis). For foreign currency borrowing, firms in our sample seem to have higher mean value for borrowing during the post crisis period with value of 0.099 rather than pre crisis period, which is 0.755. However, for local currency borrowing firms in our sample were highly leveraged after the crisis. Mean value for local currency borrowing is 0.370 compared to 0.366 pre crisis. This shows that firms borrowed more in both local and currency borrowing after the crisis period. This pattern of mean values is similar to the results found in similar studies, where firms become more leverage post crisis (Kim et al. 2015). Firms in our sample are a bit more leveraged than firms in similar studies. We believe the reason for that is that our definition of borrowing is foreign/local debt divided by total debt, while some studies use the ratio of foreign/ local debt to total assets.

Table II includes the descriptive statistics divided into the three periods pre, during, and post the financial crisis. The mean value for firms' size for the three sample periods is very similar (16.87, 16.35, and 16.55 respectively). Similarly, the mean for liquidity, asset tangibility and export status do not change much from pre-crisis to post-crisis. However, the mean for growth opportunity decreases from 0.154 pre-crisis to 0.0160 during the crisis, which is expected since during the financial crisis, firms' potential to grow become very low. Likewise, the mean of profitability decreases from 0.0560 pre-crisis to 0.0445 during crisis and then further drops to 0.0283 post-crisis. This shows that the firms used in this analysis experience shock in their profitability due to the financial crisis, which continues to worsen post-crisis period.

Table III shows the correlation coefficients for the dependent and independent variables. The biggest correlation values for foreign currency borrowing are to leverage and firm size with 0.486 and -0.194 correlation coefficients respectively. The variables most correlated to local currency borrowing are leverage and asset tangibility with 0.171 and 0.166 correlation coefficients respectively. Moreover, firm size and firm age have 0.568 correlation coefficient, which makes sense since the older the firm gets, the higher the chance of it getting bigger in terms of assets. In addition, liquidity and asset tangibility are negatively correlated at 0.285 which makes sense since the more the firm holds of tangible assets, the less it becomes liquid. The correlations mentioned above are all significant at 1% significance level.

1.6. Methodology

We use random effects Tobit model due to the fact that the dependent variable is different ratios of debt. Since not all firms have foreign currency borrowing, a good proportion of the observations will be zero (as shown in the descriptive statistics panel A).

The choice of the random effects Tobit model is appropriate for several reasons. First, by including individual effects, this model can control for firm heterogeneity. Second, since all relevant determinants of debt maturity are included in the regression specification, it is assumed that a possible correlation between unobservable individual effects and the explanatory variables can be ignored (e.g., Affinito and Tagliaferri, 2010). Therefore, we

can overcome the potential of serially correlated errors. Lastly, the fact that some of our institutional variables are non-time-varying prohibits us from using fixed effect estimator (Wooldridge, 2002). However, it is important to mention that Honore (1992) suggested an estimator for limited dependent variable models. Honore (1992) mentions that such models are often measured by maximizing a likelihood but would not usually provide the required a properties. The estimator is used to provide a simplified semi-parametric trimmed least squares estimator for fixed effects Tobit models.

We also run robustness checks with the fixed effects model to allow for the possibility of individual effects to be correlated with the regressors and the results are similar to that of the random effects Tobit model. Stephen et al. (2011) use the fixed effects Tobit model in their study of corporate debt maturity choice of Ukrainian joint stock companies. They note that under the circumstance that the firm-specific effects and the explanatory variables are correlated, the fixed effects Tobit model is expected to give reliable results.

In the summary statistics in Table I, the mean for foreign currency borrowing dummy variable is 0.7, which shows that 70% of the firms in the sample have foreign currency borrowing. This shows that there is a large number of zeros as the dependent variable; hence, OLS is not the best methodology to be used (refer to the graph in Thesis Appendix). Therefore, we employ a random effects Tobit regression model, which assumes that the unobserved individual effects are uncorrelated with the explanatory variables. Tobin (1958) devised what became known as the Tobit (Tobin's probit) or censored normal regression model for situations in which the debt ratio is observed for values greater than 0 but is not observed (that is, is censored) for values of zero or less (Lee and Zeng 1999). The Tobit model can be written as follows

$$Y_{it}^* = \alpha_i + x_{it}\beta + \varepsilon_{it},$$

$$Y_{it} = Y_{it}^* \text{ if } Y_{it}^* > 0,$$

$$Y_{it} = 0 \text{ if } Y_{it}^* \leq 0$$

where Y_{it}^* is latent variables; the term α_i represents an unobservable individual firm specific effect; x_{it} signifies the vector of observable explanatory variables for the i th firm at time t and β is the vector of parameters and ε_{it} denotes the error term. The explanatory variables impact the conditional mean of debt in the positive part of the distribution while the regressors affect the probability that the observation is in this part of the distribution. The marginal effects are estimated at sample means (Koop, p.286).

We measure three types of marginal effect. The first is marginal effect for the latent dependent variables, entailing that the reported Tobit coefficients indicate how a one-unit change in an independent variable alters the latent dependent variable. The second is the marginal effect for the expected value of the debt ratios for the uncensored observations, which indicates how a one-unit change in an independent variable affects the uncensored observations. The third is the marginal effect for the expected value of the dependent variables (censored and uncensored), which is called McDonald and Moffitt's decomposition (McDonald and Moffitt 1980). It allows us to see that a change in the control variables affects the conditional mean of the debt ratios in the positive part of the distribution, and it affects the probability that the observation will fall in that part of the distribution.

1.7. Results and marginal effects

This section shows the results for the random effects Tobit model for the foreign currency and local currency borrowing for the whole sample and for different sample periods. Results are divided into section 7.1, which includes the whole sample followed by the marginal effects, and section 7.2, which includes results based on the subgrouping for different sample periods and is followed by the marginal effects.

1.7.1. Results for the whole sample

We focus first on the results for the whole sample. *Firm Size*, measured by $\ln(\text{assets})$, is positively and significantly related to foreign currency borrowing which is following the trade-off theory. This means that bigger

firms that might have lower default risk are not inclined to borrow foreign currency. This follows the predictions of Titman and Wessels (1988) and Chechet et al. (2013) that state that larger firms are less concerned with bankruptcy costs and do not consider them an important determinant of leverage as they tend to be more diversified and have a lower chance of bankruptcy. On the other hand, firm size is showing a negative and significant relationship to local currency borrowing, which is in line with pecking order theory. The reason behind that inverse relation could be because larger firms usually have existed in the market longer than smaller firms and have lower adverse selection costs, and therefore, they could easily issue equity (Frank and Goyal 2005).

The above analysis shows that the relationship between a firm's size and the currency of debt (local or foreign) follows different and opposing theories. The reason why larger firms borrow less in the domestic currency could be because of the lack of depth that was prevalent in the East Asian financial market (Allayannis et al., 2003). In addition, what motivates larger firms to borrow more in foreign currency could be because larger firms are more likely to get foreign currency loans at better terms. Chan et al. (2011) propose that Asian firms are more prone to witness deficiency in market depth, especially for big issues, and tend to issue in foreign markets (foreign currency).

Agency theory suggests that for firms with less *growth opportunity* debt serves as an instrument that restricts the agency cost of management discretion (Jensen 1986 and Stulz 1990). Therefore, growing firms would have higher agency costs which make firms less inclined to borrow both in foreign or local currency (Allayannis et al., 2003). Our results for growth opportunity, measured by growth of total sales, are showing a negative relation to local currency borrowing, which is in line with the trade-off and agency theory. However, growth opportunity showed no significance to foreign currency borrowing. These results imply that growth opportunity of a firm is an important determinant to its local currency borrowing.

Leverage, which is measured in this analysis by using lagged values of total liabilities to total assets, has a positive and significant relationship to both foreign and local borrowing. This shows that leveraged Korean firms have more access to local and foreign currency financing. Furthermore, *liquidity*

shows negative and significant relation to both local and foreign currency borrowing, which is consistent with pecking order theory. This implies that more liquid Korean firms could have retained profits, which make them less inclined to use debt as a source of fund (Bougheas et al., 2014). On the other hand, *profitability* has a positive and significant relation to foreign currency borrowing, which implies that profitable firms have a better access to foreign currency borrowing. This is in line with the trade-off theory (Frank and Goyal 2005). However, profitability is negatively related to local currency debt, which is supported by the pecking order theory. Most empirical studies support the pecking order theory predictions, which state that profitable firms prefer to use internal fund to debt financing (Huang and Song 2006).

Firm Age, measured by Ln (age), has negative and significant relation to foreign currency borrowing but has no significance to local currency use. This might imply that as firms get older, their market presence allows for other forms of financing other than bank loans (Gonzalez et al., 2007). Firm age follows the predictions of the pecking order theory. Furthermore, the *tangibility of assets* which proxies the firm's capability to secure collateral for debt financing is positively and significantly related to both local and foreign currency borrowing. Bradley et al. (1984) and Chechet et al. (2013) state that firms that spend heavily on tangible assets tend to have higher financial leverage because they borrow at lower interest rates since their debt is secured by such assets. In addition, according to Wedig et al. (1988) when there are durable assets to function as collateral, firms are more inclined to use debt financing. This supports the idea that firms that can provide collateral for firms would have better access to loan, especially foreign currency loans.

The *export status* variable has a positive and significant effect on both foreign and local currency borrowing. This is in line with the risk management theory as it shows that as firms have more exporting activities, they borrow more foreign currency to act as a shield against unexpected currency fluctuations.

Although our dataset makes it hard to test competing theories, our results show that different currency borrowing follows predictions from different capital structure theories. For foreign currency borrowing, results show that Korean firms followed the predictions of the trade-off theory. It is apparent in

the positive relationship between firm size, firm profitability and foreign currency borrowing ratio. It also follows predictions of the pecking order theory in the inverse relationships between firm age and foreign currency borrowing and liquidity and foreign currency borrowing. Risk management theory is also important for foreign currency debt as there is a positive relationship between exports status and foreign currency borrowing. For local currency borrowing, results are mostly in line with the pecking order theory. It is shown in the inverse relationship between firm size, liquidity, profitability and firm age. Results for asset tangibility show that Korean firms follow signaling theory for both domestic and foreign currency borrowing. Moreover, both types of debt follow the predictions of signaling theory. Firm profitability is negatively related to local currency borrowing as hypothesized. However there is a positive relationship between profitability and foreign currency borrowing. This might be due to profitable firms inclination to borrowing in foreign currency to signal good financial position or perhaps lending institutions might be more willing to lend more to profitable firms.

As a robustness check, we add another variable important for the Korean firms to the regression; it is called Chaebols. Chaebols variable is a dummy variable to examine the effect of Chaebols conglomerates on debt financing. It takes the value of 1 if a firm is one of the 30 largest conglomerates in Korea and 0 otherwise. According to Kim and Lee (2003), the Korean Fair Trade Commission (KFTC) in April each year gives rankings to Korean conglomerates (Chaebols) based on their total assets and size. Firms are classified as Chaebol or Non-Chaebol each year according to the information declared by KFTC. The KFTC then announces the largest 30 Chaebols groups. Kim and Lee (2003) show that the average market capitalization of Chaebols firms in 1997 was 321 billion Korean won, which was more than double that of Non-Chaebols firms (125 billion won), whereas the average total assets of Chaebols was 1.7 trillion won, which was more than five times that of Non-Chaebols firms (0.3 trillion won). Therefore, Chaebols and Non-Chaebols firms should be analysed separately. The results show that Chaebol do not have any privileges post- crisis while Chaebol has an inverse and highly significant relation to foreign and local borrowing post-crisis. After adding the Chaebol variable, all results for other control variables stay the same as in the

baseline model. Moreover, we utilise an alternative measure of profitability (operating income/ total assets), and we have found very similar results as the baseline model.

1.7.2. Marginal effects for the whole sample period

This section discusses the marginal effects calculated for the estimates reported in Table IV for the whole sample period. There are 3 types of marginal effects. They include marginal effect of the latent dependent variable, marginal effect on the expected value of the dependent variable for uncensored observation and marginal effect on the expected value of dependent variable, censored and uncensored (Table VI Panels A, B, C). The results of the three types of marginal effects are consistent with each other; therefore, we only discuss one type of marginal effect, which is the expected value of dependent variable, censored and uncensored (Tables VI panel C).

For foreign currency borrowing, the variables with the highest marginal effects are leverage and asset tangibility. An increase of 1% in leverage and asset tangibility increases the probability of borrowing by 23% and 22% respectively. Similarly, leverage and asset tangibility have the highest effect on local currency borrowing. An increase of 1% in leverage, and asset tangibility increases the probability of borrowing by 12% and 4% respectively.

1.7.3. Results for different sample periods

This section analyses the determinants of debt in different time periods: pre-crisis (1990-1996), during the crisis (1997-1998) and post-crisis (1999-2006). As shown in Table V, analysis of *Firm Size* shows that it is positively and significantly related to foreign currency borrowing throughout the whole sample period. This is in line with the trade-off theory, which suggests that larger firms tend to have better access to credit and are able to use more debt than smaller firms (Friend and Lang 1988). On the other hand, firm size has a negative and significant relation to local currency borrowing pre-during and post-crisis. These results imply that bigger firms have more access to foreign currency loans. Moreover, the inverse relation between domestic loans and

firm size confirms the fact that raising money locally was very hard for Korean firms around the time of the financial crisis. These results are in line with the pecking order theory which argues that less asymmetric information about larger firms lowers their probability of undervaluation of their new equity, which motivates big firms to use equity financing and issue less debt (Rajan and Zingales 1995)

In the present work, *Growth opportunity* determinant has a significant positive effect on foreign currency borrowing during the crisis, but it shows no significance pre or post-crisis for foreign currency borrowing. This means during the crisis, only firms with growth opportunities had access to foreign currency borrowing. However, growth opportunities showed negative and significant relation to local currency during and post crisis. This might imply that during the crisis firms with growth opportunities avoided borrowing especially in local currency, which makes sense since the Korean won sharply devaluated during the crisis. Nevertheless, this could also mean that during that period of time, lending institutions were restricting giving out loans in general. Growth opportunity variable follows predictions of the pecking order theory which imply that since asymmetric information is sometimes high initially, a firm's new equity issuance tend to be undervalued. This makes costs of new equity very expensive. Therefore, firms would prefer to use debt rather than equity, as it would mean fewer changes in future value when inside information is available in the market (Myers 1984).

Leverage shows a positive and significant relationship to foreign currency borrowing crisis during and post crisis. However, it shows no significance before the crisis. This implies that during the crisis only highly leveraged firms had access to foreign currency borrowing. For local currency borrowing, leverage has a positive and significant effect pre, during and post crisis. Moreover, a firm's *liquidity* has an inverse and significant relationship to both foreign and local currency borrowing post-crisis, which is in line with pecking order theory. The theory suggests that high liquidity firms are less inclined to issue debt. The reason for that is that these liquid assets are controlled by managers who might be influenced to favour shareholders wishes against debt holder's interest causing agency costs of debt (Pinkova 2012). Liquidity is

showing a positive and significant effect on foreign currency borrowing pre and during the crisis, which is in line with the trade-off theory.

Additionally, *profitability* proved to be a significant determinant of capital structure decision for foreign currency debt post-crisis only. Profitability, also showed significant negative relation to local debt ratios pre, during and post crisis, which is in line with the pecking order theory. This implies that profitable firms might be less inclined to issue foreign debt during a financial crisis to avoid any information asymmetry between their firms and outside investors (Gatopoulos and Louberge 2003). Regarding *Firm Age*, findings show that it has a negative relation to foreign currency borrowing pre, during and post crisis. This might imply that as firms get older, their market presence allows for other forms of financing other than bank lending (Gonzalez et al., 2007). On the contrary, it was only during the crisis that older firms had better access to local currency debt, and it showed positive significance to borrowing.

Furthermore, the *asset tangibility*, which is proxy for collateral, showed positive significance to foreign currency borrowing pre and post crisis and same positive significance local currency borrowing post-crisis. This makes sense as one would expect a positive relationship between collateral and foreign currency borrowing as foreign banks require more collateral to lend money. This is in line with both trade-off and pecking order theories, as trade-off theory suggests that firms issue debt financing when they have enough tangible assets while the standpoint of the pecking order theory suggests that when firms use collateral to secure debt financing, this reduces the asymmetric information related costs (Ahmed and Aris 2015).

The *Export status* variable has a positive and significant relationship to foreign currency borrowing pre and during the crisis. This is consistent with the risk management theory as it shows that as firms have more exporting activities, they borrow more foreign currency to act as a shield against unexpected currency fluctuations. Exporting shows positive significant relation to local currency borrowing pre and post crisis.

1.7.4. Marginal effect for different sample periods

Foreign currency borrowing

This section provides the marginal effects calculated for the estimates reported in Table V for different sample periods. Marginal effects are reported in Table VII, Panels A, B, and C. For the pre-crisis period, with regards to foreign currency borrowing, asset tangibility has the highest economic impact. 1% increase in tangible assets increases the probability of foreign currency borrowing by 40%. During the crisis period, leverage and asset tangibility have the highest marginal effect, as 1 % increase in leverage and asset tangibility increases the probability of borrowing by 11% and 30% respectively. It is the same case in post-crisis period as 1% increase in leverage and asset tangibility increases the probability of foreign currency borrowing by 26% and 28% respectively.

The variables that have the highest marginal effect on foreign currency borrowing change from one period to another. Firm size is highly significant at 1% level pre, during and post crisis; however, the marginal effect was highest post-crisis at 8% compared to 3% pre and during the crisis. This shows that since after a crisis lending organisations would be less reluctant to give out loans, bigger firms would have better access (higher probability) to foreign currency borrowing than smaller firms. Firm age, in spite of the fact that it has significant negative relation to foreign currency borrowing throughout the time periods, it has the highest marginal effect during the crisis. Firms that are more liquid borrowed less during the crisis period, as 1% increase in liquidity led to lowering of the probability of borrowing by 1%. Moreover, while firm leverage has negatively significant correlation throughout the time period, it shows the highest marginal effect post-crisis, as 1% increase in leverage leads to increasing the probability of borrowing by 26%. Finally, while asset tangibility showed high significant correlation pre and post crisis, it has the highest impact pre-crisis. An increase of 1% in asset tangibility improved the probability of foreign currency borrowing by 40%.

Local currency borrowing

Leverage has the highest impact on local currency borrowing pre-crisis, as 1% increase in leverage increases the probability of local currency borrowing by 3%. Leverage also has the highest marginal effect on local currency borrowing for the crisis and post-crisis periods. This is in line with the

literature as the financial position of the firms, especially how liquid and leveraged they are, play an important role in their borrowing decisions.

The variables with the most significance for local currency borrowing that are consistent throughout the sample periods are firm size, growth opportunity, profitability, and leverage. It is interesting to note that although they have the same significance level throughout the sample period, the 4 variables have the highest marginal effect during the post-crisis period. Therefore, 1% increase in size and growth opportunity lowers the probability of local currency borrowing by 2% and 1 % respectively. Similarly, 1% increase in profitability lowers the probability of borrowing by 3%. On the contrary, 1 % increase in leverage heightens the probability of borrowing by 15%. Having the marginal effects dominant for the local currency borrowing during the post-crisis period for Korean firms supports the idea that borrowing became hardly accessible post-crisis and there were certain criteria that firms had to meet in order to borrow. In order to increase their probability of borrowing firms had to make sure that certain determinants of the capital structure were present like the right size, growth opportunity, profitability, liquidity, and leverage.

1.8. Robustness checks

In this section, a series of checks are conducted to confirm the robustness of the relationship between local and foreign currency borrowings and independent variables used, which are related to the capital structure theories. We use the fixed effects model as an alternative model due to the fact that some subsamples do not have many zeros for debt ratios as others. Second, we add Chaebol to the baseline model to see if being a member of Chaebol affects the borrowing structure. Third, we use an alternatives measure for profitability to examine if results change from the baseline model or not.

As discussed earlier, the use of random effects Tobit is due to the fact that the dependent variable is ratios of debt, and many firms do not have all types of debt leading to the existence of many zeros. However, in some subsamples the percentage of zeros is small. For example, there are only 9 firms in the left-censored observations for local currency borrowing during the crisis as shown in Table V. Hence, compared to the total observations of 2,442, the ratio then becomes 0.004%, which means only 0.4% of the observations during the crisis

have zero local currency borrowing. Therefore, we use the fixed effect model as an alternative model. We include an interaction term between time and industry dummies. Most results remain unchanged. For example, growth opportunities, leverage, and asset tangibility have the same results as the Tobit model (Table VIII). We also use the fixed effects model on different sample periods and results are similar to that of the Tobit model. Results of the fixed effect are shown in Tables VIII and IX.

1.9. Conclusion and discussion

Our results show that determinants of foreign currency borrowing and local currency borrowing in Korea are in line with the theoretical predictions of capital structure theories. This study shows that in order to be able to borrow in Korea, firms must be big, well leveraged and have enough tangible assets to present as collateral. In addition, firms that are profitable and in the exporting business are able to gain access to foreign currency borrowing. Results show that different currency borrowing follows predictions from different capital structure theories. Foreign currency borrowing follows prediction of trade-off theory, pecking order theory and risk management theory. For local currency borrowing, results are mostly in line with the pecking order theory. Results for asset tangibility, which is a proxy for agency theory, show that Korean firms follow signaling theory for both domestic and foreign currency borrowing. Moreover, both types of debt follow the predictions of signaling theory. This study has the limitation of not being able to test between competing theories; therefore, this could be an opportunity for further research.

Although we have chosen to focus on estimating reduced form model, our results have implications for structural models of multilateral borrowings. Clearly, structural borrowing model could help in explaining the behavior of borrowing in our sample countries and it is possible that fundamentally different models will be required to explain the divergence in our results. Therefore, structural model could be estimated in future work.

The Korean financial market took a strong hit in the crisis, and there are many Korea specifically related issues (like Chaebols) that needed to be analysed separately from the other EA countries. After studying the Korean financial market around the time of the crisis, we have found that there are

commonalities between the factors that drive firms to borrow in both foreign and local currency. This paper, to the best of the author's knowledge, is among the first papers to study Korean debt market independently from other EA markets and investigate its borrowing schemes, pre, during and post the financial crisis while comparing the results to capital structure theories' hypothesis. An argument might arise, however, as to what is the importance of studying a crisis that happened a long time ago and how it might affect the borrowing decisions today.

Although the currency crisis happened many years ago, still Korea will never be immune from it happening again, nor any other country for that matter. There is a global concern about currency devaluation and its effect on multinational as well as national firms. It is, therefore, important to study the determinants that affect borrowing before, during and after a crisis period. It is essential to know precisely who carries the burden of the currency crisis and devaluation, and what determinants promote different currency borrowing during and after the crisis periods.

Table I: Descriptive statistics whole sample

Table I provides the descriptive statistics for the whole sample period. Panel A includes the dependent variables, and Panel B shows the control variables. The dependent variables are: the ratio of foreign currency borrowing/ total liability and ratio of local currency borrowing/ total liabilities. Local and foreign currency dummies are variables that take value 1 if the firm has local or foreign borrowings and 0 otherwise. The independent variables are: size measured as Ln (assets), growth opportunity measured as growth rate of log sales, leverage measured as lagged values of total borrowings/total assets, liquidity measured as current assets divided by current liability, profitability measured as operating income/ total sales, age measured by Ln (age), asset tangibility measured as tangible assets/ total assets, export status measured as export sales/total sales.

Panel A: Dependent variable	
Dependent variables	Mean
Foreign currency borrowing	0.0894 (0.132)
Foreign currency dummy	0.664 (0.472)
Local currency borrowing	0.369 (0.219)
Local currency dummy	0.976 (0.153)
Panel B: Control variables	
Firm size	16.59 (1.384)
Growth opportunity	0.152 (0.423)
Leverage	0.382 (0.211)
Liquidity	1.559 (1.629)
Profitability	0.0357 (0.169)
Age	13.24 (10.75)
Asset tangibility	0.373 (0.201)
Export status	0.217 (0.295)
Number of firms	4,017

Table II: Descriptive statistics for different time periods

Table II provides the descriptive statistics for different time periods. The dependent variables are: the ratio of foreign currency borrowing/ total liability and ratio of local currency borrowing/ total liabilities. The independent variables are: size measured as Ln (assets), growth opportunity measured as growth rate of log sales, leverage measured as lagged values of total borrowings/total assets, liquidity measured as current assets divided by current liability, profitability measured as operating income/ total sales, age measured by Ln (age), asset tangibility measured as tangible assets/ total assets, export status measured as export sales/total sales.

	Pre-crisis	Crisis	Post-crisis
Variables	Mean	Mean	Mean
Foreign currency borrowing	0.0755 (0.0935)	0.0997 (0.132)	0.0922 (0.142)
Local currency borrowing	0.366 (0.182)	0.367 (0.202)	0.370 (0.232)
Firm size	16.87 (1.396)	16.35 (1.559)	16.55 (1.338)
Growth opportunity	0.154 (0.319)	0.0160 (0.446)	0.171 (0.437)
Leverage	0.418 (0.202)	0.416 (0.209)	0.367 (0.212)
Liquidity	1.207 (1.041)	1.319 (1.267)	1.700 (1.794)
Profitability	0.0560 (0.120)	0.0445 (0.151)	0.0283 (0.183)
Age	14.12 (10.53)	12.44 (10.60)	13.11 (10.83)
Asset tangibility	0.377 (0.181)	0.362 (0.196)	0.373 (0.208)
Export status	0.265 (0.297)	0.211 (0.295)	0.203 (0.293)