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Determinants of Corporate Capital Structure in East Asia: Are there differences from the Industrialized Countries?

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- Are there differences from the Industrialized Countries?-

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ABSTRACT

This paper investigated micro-economic variables that determined corporate capital structure in the East Asian countries of Indonesia, Korea, Malaysia, the Philippines and Thailand in the aftermath of the 1997 Asian financial crisis.

In general, there is a high level of dependency by firms on short-term external financing. Based on empirical analyses, the study found a significant negative relationship between firm profitability and corporate debt-to-equity (DE) ratio in all the sample countries. Firm size also has a direct relationship with DE ratio in many countries. On the other hand, the relationship between corporate debt-to-equity (DE) ratio and firm's tangibility -- generally significant in the industrialized countries -- is entirely insignificant even in the post-crisis period.

I. Introduction

How do firms manage their corporate financial requirements and what determines corporate capital structure in East Asia? This question has been an issue of strong interest for a long time; however, few papers have tackled this prior to the 1997 Asian financial crisis. Since this event, studies have at last started to come out focusing on the issue.

On the other hand, numerous studies have investigated capital structure in industrialized countries in the past forty years since Modigliani and Miller's seminal work on the same topic. Initially, focus was given to firms in the United States in these early studies. In the mid-1980s, research coverage widened to Europe and Japan.

In the wake of the Asian financial turmoil, research efforts extended to emerging countries to bring to light the factors that led to the financial debacle in the region. In spite of these recent attempts, however, there have been only a few studies thus far because of constraints on corporate financial data in the region.

This paper, reflecting previous hypotheses in studies of firms in industrialized countries, considers determinants of capital structure of East Asian firms from the viewpoint of information asymmetry and agency cost. Previous studies suggest that there are differences in environments involving principals and agents among the countries even within similar bank-centered or market-centered economies. This paper goes further by determining how asymmetric information influences corporate finance practices in immature lending and capital markets of East Asia.

In this study, empirical analyses of panel data of public firms in Indonesia, Korea, Malaysia, the Philippines, and Thailand were carried out to achieve the above-mentioned research objectives.

The findings are presented in three sections in this paper. Section I is a descriptive discussion on the funding environments of each of the countries under study. Based on the historical pattern and changes in the economic and legal environment in the four markets explained in Section I, Section II presents hypotheses exploring the relationship between a firm's internal funding, size, collateral values and growth opportunities with capital structure as measured by debt to equity ratio. Section

III discusses the empirical results in each of the four countries under review.

In summary, the findings of the empirical studies show that capital structure of firms in East Asia is strongly influenced by an individual firm's internal funds and firm size. On the other hand, collateral values and growth opportunity have insignificant relationships with capital structure. Reflecting the above empirical results, this paper concludes costs associated with information required by the external financing institutions drive firms to depend on internal capital. Moreover, the immature level of corporate legal systems concerning the corporate finance possibly could have led to the insignificant empirical result concerning collateral.

I. The Corporate Finance Environment in the Sample Countries

1. Indonesia

Indonesia is predominantly a bank-centered economy in so far as corporate finance is concerned. Domestic firms rely principally on bank loans, basically in the form of bank overdrafts, discount of trade bills and commercial paper, as well as inter-company borrowing.

Indonesian firms generally borrow short term at variable rates, and roll over the loans, usually after six months. Access to long-term funding is generally difficult. Banks expect payment of "renewal" fee every time a loan is rolled over, and the interest rate is renegotiated. Interest paid on borrowings in the form of bank loans and overdrafts and other forms of credit is deductible from corporate income as a business expense under the reformed tax system of 1984[1]. However, discounting trade bills and issuance of commercial paper do not have special tax considerations.

In Indonesia in the past, relationship with banks used to be a critical and important factor in securing financing. Some conglomerates or business groups were allowed to establish commercial banks to serve the needs of other corporations within the group. However, lending to affiliates is now legally restricted and funds lent to any single borrower or group of borrowers related to the bank is limited to not more than

[1] Foreign exchange losses on borrowing are also deductible.

10 percent of total capital[2].

As for offshore borrowing, in the mid-1990s when credit was available, local companies found willing lenders overseas through the issuance of promissory notes without reporting it to Bank Indonesia. As a result, those firms had large amounts of foreign-currency debt that were not officially recorded by the government.

On April 15 1998, Bank Indonesia issued new regulations governing offshore liabilities and ordered borrowers to report to the Bank all offshore borrowing within 14 days. In a complementary move to address the financial crisis, the *1992 Bank Law* was amended to put in place reforms relative to bank lending in October 1998. A key reform provided that all bank loans henceforth had to be secured by a collateral.

Also in April 1998, the bankruptcy reform law was ratified and instituted the establishment of commercial courts as the second judicial system to adjudicate bankruptcy proceedings. Rules and regulations on composition and payoff delay were reformed, and regulations on negation right were clarified. Consequently, the new provisions that had been put in place, including implementing procedures, enabled both creditors and debtors to carry out debt restructuring proceedings. However, the law did not provide for corporate reorganization policies and procedures. In a recent bankruptcy case, a court in Jakarta rejected a bankruptcy petition, declaring that debtors' insolvency did not always constitute bankruptcy.

The number of bankruptcy petitions in Indonesia is still very low. According to Suzuki (2000), the bankruptcy cases number approximately 70, which was expected to grow to more than 1,000 in August 1998 - June 1999. Under the circumstances, the legal structure has been favorable to corporate borrowers and, conversely, unfavorable to creditors.

2. South Korea

Like in Indonesia, South Korean firms rely principally on commercial bank loan for their financing requirements. According to an annual report of the Financial

[2] After the reform of financial regulation after 1999, total borrowings must not exceed 10 percent of

Supervisory Committee of 2001, bank loans accounted for approximately 57 percent of external funding source of Korean firms. Discounting trade bills, commercial papers, and overdraft facilities are also prevalent.

On the other hand, the long-term funding demand is generally met by frequent rollovers and renewals of short-term loans. Most bank loans are negotiated on a one-year basis, and those are rolled over after terms have been renegotiated. Bank loans are mostly set at fixed rates until the 19997 financial crisis. Since then, the mode shifted to variable rates, with loan maturity diversified after the crisis.

Although the need for long-term bank lending is generally substituted by rollovers of short-term loans, bond issuance has become an important long-term financing source, with corporate bond issues experiencing explosive growth in the past several decades. The majority of corporate bonds in Korea are issued in the form of fixed rate non-guaranteed coupon bonds.

Until 1998, the corporate bond market was almost monopolized by firms belonging to the *chaebols*, and they accounted for 75 percent of total outstanding capital raised from the bond market. However, as a result of the corporate restructuring in Korea, the total share of *chaebols* as a group decreased to 44.7 percent of in 2001.

Although inter-company borrowing and cross-subsidiary financing are theoretically unavailable, firms owned by *chaebols* channel cash from one to another through their sister financial institutions. In addition, the lead companies of the chaebol groups guarantee the borrowings of their affiliates. The practice contributed to high debt to equity ratio of *chaebol* firms. The Korean Financial Supervisory Committee banned this practice in April 1998, but it is alleged that the practice continues to take place under various guises.

There existed several regulatory provisions on bank lending even before the financial crisis under the *Commercial Bank Law*, such as the single borrower's limit and inter-company lending. On the other hand, overseas borrowings have gradually

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capital.

been deregulated in 1992-2001 in line with liberalization policies. In the area of taxation, interest payments on bank loans are tax-deductible as long as interest accrued on loan does not exceed 500% of the equity capital.

Similar to Japan, bankruptcy cases in South Korea are filed when debtor firms are in default in servicing their loans and are considered insolvent or considered to hold excessive liabilities. However, it is impossible for creditors to prove that a debtor has excessive liabilities. Creditors thus usually petition for bankruptcy only for borrowers that are considered insolvent. Consequently, as long as debtors service interest payments, they have a certain level of protection from creditors even if they hold excessive liabilities.[3]

3. Philippines

The most popular mode of financing in the Philippines is bank loans and commercial paper issues. Commercial and thrift banks offer loans of up to one-year maturity, either in Philippine pesos or US dollars. Overdrafts are prohibited by the Central Bank; nonetheless, similar arrangements such as credit lines are available to many corporations. Thus, banks provide a revolving credit line that satisfies the firm's continuing funding requirements. Large corporations have access to bank credit with longer maturities, usually under special credit facilities or through syndicated lending facilities. Smaller firms, however, generally depend on straight short-term borrowings.

Discounting trade bills, factoring and financial leasing have grown in volume in recent years and private placement of notes and structured finance are also available legally. Discounting trade bills are especially popular to foreign invested domestic firms.

There is no domestic bond market in the Philippines. However, the Corporation Law allows corporate bond issuance by corporations under the supervision by the Securities and Exchange Commission (SEC). In addition, under the Corporation Code, a capital-raising exercise requires a two-thirds majority approval of

[3] In emerging countries, simultaneous high interest rates and excessive liability are easily generated

shareholders. More than 10 Million PHP borrowing from abroad must be also reported to the Management of External Debt Department (MEDD) of the Philippine Central Bank.

Interest payments of bank loans and credit lines are deductible from taxable corporate income. However, if borrower is a non-resident foreign company, it is assessed a 20 percent withholding tax rate by the lending domestic bank. A 5 percent gross receipts tax is imposed on the receipts or sales of banks. Dollar-denominated loans from banks' foreign-currency deposit units (FCDUs) are subject to a 10 percent withholding tax[4].

The bankruptcy law in the Philippines was originally based on the Spanish legal system and American corporate law (i.e. the *Bankruptcy Law* 1909). The system stipulates conditions and regulations on bankruptcy, composition, and procedures for debt moratorium and reorganization as supervised by a court[5]. Various government policies and regulations on bankruptcy and reorganization have been formulated and are monitored and implemented by the Philippine Securities & Exchange Commission.

Filing for bankruptcy can be petitioned by both debtors and creditors, and is supervised by the SEC, which is also a quasi-judicial body on top of its corporate regulatory or "watchdog" functions. Debtor companies can also petition the SEC for debt moratorium. In addition to debtors and creditors, shareholders may petition for a corporate reorganization when the firm is deemed to hold excessive level of liabilities or in cases of disagreements with corporate management.[6]

4. Malaysia

Commercial banks are the major suppliers of both short-term and long-term credit in Malaysia.

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when the economy is under excess liquidity caused by short-term capital inflow and so on.

[4] Interest payments are tax deductible for issuance of commercial paper and discounting of trade bills, but a documentary stamp tax of P0.30 for every P200 or fraction thereof of the offering.

[5] However, an only corporate procedure for reorganizational moratorium is partly supervised by the Philippine SEC.

[6] In the Philippines, Rules of Procedure for Corporate Recovery that allows failed firm to delay interest payment until the procedure starts under the SEC's control is stipulated on January 15th, 2000.

Most firms prefer longer-term credit particularly for long-term financing projects. Nevertheless, smaller, less credit worthy firms are forced to settle for short-term funding. Bank loans are generally the most popular choice for borrowing in Malaysia, and about 90 percent of borrowings carry floating-rate interest rates[7].

Total outstanding loans in the banking sector stood at M$432.8bn as of end-2001. Of the total, 75.1 percent was from commercial banks, 21.6 percent from finance companies and 3.3 percent from merchant banks. Of the term loans, those with a maturity of up to one year totaled 37 percent, while loans of more than one-year maturity constituted 47.3 percent and syndicated loans accounted for 3.8 percent.

The government-subsidized Export Credit Refinancing (ECR) scheme provides the cheapest available form of short-term credit, followed by banker's acceptances, discounted trade bills and overdrafts. Interest on bank credit is tax deductible as an expense. However, the Inland Revenue Department has issued instructions on the treatment of interest as investment income and this addresses whether an investment can be considered income producing or non-income producing. Although interest from the former is tax deductible, the latter is levied.

Malaysia's bankruptcy institutions were drawn from the English legal system. Its bankruptcy laws principally cover procedures concerning corporate liquidation and composition. In case of corporations, the procedure of bankruptcy is stipulated in the *1965 Companies Act*, the *Companies Regulations* and *Companies Rules*. In case of individuals and partners under partnership management, the *1967 Bankruptcy Act* or the *Bankruptcy Rules* are applied. The *1965 Companies Act* was partly reformed in June1998. The reform measures included rules on reorganization proceedings through the Danaharta, Malaysia's public asset management company.

Malaysian bankruptcy related regulations cover both liquidation and reorganization. Chapter 10 of the *Company Act* stipulates that both the debtor may declare its own bankruptcy and a creditor can file for bankruptcy proceedings against

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[7] Commercial banks are required to anchor their lending rates to their published base lending rates, i.e., BLR. Lending rates are priced up to 2.5 percentage points above BLRs (Base Lending Rate), depending on the borrower's credit rating.

a specific borrower. In either case, a court supervises the proceedings. As prescribed by law, the court allows creditors to petition for bankruptcy when the debtor delays payment of a minimum 500 Malaysian Ringit in interest charges for more than three weeks.

5. Thailand

Bank overdrafts, priced at either the minimum-lending rate or the minimum-overdraft rate, have been the most common instruments for short-term financing in Thailand. Long-term credit has been traditionally rare; after 1997-98, access to such has become even more difficult. Bank credit extended on a fixed-rate basis is also rare, because overdraft facilities are normally used for this purpose. Funds raised from short-term loans, other than overdrafts, are used for bridge financing[8].

Commercial paper and corporate bond issues have become a popular and significant form of financing starting 1998. Nevertheless, the major issuers or beneficiaries are the larger conglomerates, which have the manpower and resources to satisfy the regulatory and documentation requirements of such financing strategies. Banker's acceptances and factoring are still relatively rare. Discounting trade bills through The Export- Import Bank of Thailand and inter-company borrowing are also signification; however, in the wake of the financial crisis, rules and procedures on availing of such facilities have been tightened.

A borrower's interest payments are deductible from corporate income. Interest on loans is subject to withholding tax at the rate of 15 percent.

The fact that there has been no failed listed firm for 57 years until the bankruptcy law was reformed in 1998 reflects the inadequacy of bankruptcy regulations in Thailand. In the past, the legal structure consisted exclusively of rules on corporate liquidation as mandated in its bankruptcy law. Hence, no firm could petition for a

[8] In 1998, the Bank of Thailand set the maximum interest rates charged by commercial banks at the MLR plus 2.75% per year. Finance firms were limited to offering a maximum interest call rate for promissory notes equal to the average benchmark of the four main banks, plus 300 basis point.

corporate recovery.

Until the 4th legislative reform of the bankruptcy law, creditors were reported to be in a far more unfavorable situation vis-à-vis their debtors in many aspects. For example, under the previous law, financial institutions could not legally act when a debtor delayed interest payments. Since no law concerning corporate reorganization existed, Thai financial institutions had no recourse other than to petition for bankruptcy and liquidation, which often forced them to accept partial claim abandonment.

Table 1 Financial Techniques in the East Asian Countries

		Indonesia		Korea		Malaysia		Philippines		Thailand	
		-1997	1998-	-1997	1998-	-1997	1998-	-1997	1998-	-1997	1998-
Short-term	Bank loans	○	○	○	○	○	○	○	○	○	○
	Overdrafts	○	○	○	○	○	○			○	○
	Discounting of trade bills	○	○	○	○	○	○	○	○	○	○
	Commercial paper	○		○	○	○	○	○	○	○	○
	Banker's acceptances					○	○	○	○		
	Intercompany borrowing	○		○		○	○	○	○	○	○
	Factoring	○		○	○	○	○	○	○	○	○
	Supplier credit	○	○	○	○	○	○	○	○	○	○
Long-term	Bank loans	○	○	○	○	○	○	○	○	○	○
	Private placement of notes			○	○	○	○	○	○	○	○
	Coorporate bond issues			○	○	○	○				
	Commercial Paper							○	○		
	Financial leasing	○	○	○	○	○	○			○	○
	Structured finance	○	○		○		○			○	○
	Equity finance	○	○	○	○	○	○	○	○	○	○
Single Borrower's Limit			Yes		Yes			Yes	Yes		
Regulation on borrowing from abroad			Yes	Yes			Yes	Yes	Yes		Yes
Regulation on intercompany finance			Yes		Yes	Yes	Yes	Yes	Yes		Yes

note: "○" means the technique has high use in the country. Blank means it is not legally permitted or considered to be very low use.
Source: Author made based on Economist Intelligence Unit, " Country Finance 2002" various countries.

Table 2 Summary of Corporate Bankruptcy Legislative Structure in the selected East Asian countries

	Indonesia	Korea	Malaysia	Philippines	Thailand
I. Origin	Dutch Legal System	Japanese Legal System	British Legal System	Spanish Legal System and American Corporate Law	Original legal system partly reflecting British system
II. Legislative Structure	Integrated in a Bankruptcy Law	Bankruptcy Law, Composition Law, Corporate Reorganization Law	Bankruptcy Law, Companies Act	Dispersed in Bankruptcy Law and related President Act.	Integrated in a Bankruptcy Law
III. Enacted/Revised Year	1905 Bankruptcy Ordinance Reformed in 1998	1962 Bankruptcy Law, 1962 Composition Law 1963 Corporate Reorganization Law	1967 Bankruptcy Act 1965 Companies Act (reformed in 1998)	1909 Bankruptcy Law 1976 Presidential Act	1940 Bankruptcy Law 1998, 99 Reformed
IV. Jurisdiction	Specialized Court of bankruptcy	General Court	Civil Court	General Court, Security Exchange Commission	Bankruptcy Court
V. Procedure of Petition in Bankruptcy 1. Available reason of declaration	Debt default	Debt default, Insolvency	Enforcement-Debt default, Excessive liability Arbitrarily-Excessive liability	Debt Default, Insolvency	Insolvency, Excessive liability
2. Those who can declare	Debtor,Creditor,Court,Central Bank etc.	Debtor, Creditor, Liquidator	Enforcement-Creditor, Debtor, Regulatory agency,Arbitrarily-Debtor	Debtor, Creditor	Creditor, Voluntary bankruptcy is not permitted.
VI. Corporate Reorganization Proceedings 1. Available reason of declaration	None	Debt default, Excessive debt	None	Excessive liability	Excessive liability, but the firm has possibility to revive
2. Those who can declare		Debtor, Creditor, Selected shareholder		Debtor, Creditor, Shareholder	Debtor, Creditor, Regulatory agency

Source: Japan Center for International Finance(2000), "Bankruptcy Law of East Asian countries" *Financial Review*, September 2000, Suzuki(2000), "Legal Reform of East Asian Countries and Corporate Disclosure", April, 2000, Japan Bank for International Corporation

II. Hypothesis

The previous section presented the various external financing sources available to firms in the East Asian countries under review. Except Korea, the other four countries heavily depend on internal funds and short-term bank borrowing. In addition to the bank borrowing, trade bills discounting and overdrafts are also used as attached short-term financing tools.

Short-term financing sources are the most readily available because of the relatively low-level of development of the financial markets – which consequently have lower degree of diversification -- in the East Asian countries. Short-term financing instruments are directly used in operations and are therefore mobilized directly contribute to a firm's short-term profitability, which in turn are directly linked to its debt repayment ability. Lenders and creditors therefore achieve a certain market "equilibrium" in so far as credit demand and supply are concerned. Furthermore, the equity capital markets, another alternative source of external funding for firms, in East Asia, are likewise relatively underdeveloped, and thus access to such funds is limited.

Reflecting on the above points, this chapter took the task of analyzing the firm's capital structure from the viewpoint of internally generated funds and the two components of corporate capital, i.e., bank borrowings and equity, and relating it to explanatory micro-economic determinants. Various hypotheses were formulated and are presented as follows:

1. Hypothesis 1

Our first hypothesis proposes that firms in East Asia tend to prefer internal funds when they have excess profits to external funds and thus dampens further borrowing activity.

A previous study of Rajan and Zingales (1995) showed that firm profitability has a negative relationship with debt to equity ratio in four of seven industrialized

countries. In their model, equity is quantified in terms of market value[9]. Profitability in this case is a measure of the firm's internal funds. The results tend to lend credence to the hypothesis that the availability of excess financial resources dampens borrowings. Although the findings of Rajan and Zingales (1995) may not prove applicable for East Asian countries, the hypothesis predicts a negative coefficient in the model.

Myers and Majluf (1984) pointed out that firms generally choose financing techniques in ascending order of information costs, when there exists a high degree of information asymmetry between corporate insiders and outsiders. This hypothesis predicts a higher degree of dependency upon internal funds when firms do not have special relationship with banks and other financial agents. Firms with lower incomes will tend to have limited access to external financial institutions because they may be unwilling to shoulder the cost of bridging themselves with outsiders.

Within the framework of information asymmetry, a positive sign is therefore possible when appropriate managerial discipline is exerted on firms by shareholders and creditors (outsiders) as propounded by Jensen (1986) and such discipline results in growing profitability. In line with the hypothesis, such firms would be in position to access external funds and thus increase their indebtedness in proportion to their nominal profitability. This is highly plausible in East Asia where export-led industrialization is the principal economic engine. As noted in the foregoing section, trade bills discounting and overdrafts are popular financing instruments, and this is specifically true for exported-oriented manufacturers and related firms.

2. Hypothesis 2

Our second hypothesis states that larger East Asian firms tend to have higher

[9] In case that equity is evaluated in term of book value in an empirical result of Rajan and Zingales(1995), there are three countries that have significant negative relationship between debt to equity ratio and profitability.

debt to equity ratio levels.

According to the literature, large firms generally have diversified product lines, and this diversification is considered to protect them over time from demand downturns in specific business or product classes, thus lowering the probability of income loss or in the extreme case insolvency.

In East Asia, most conglomerates or business groups are large in terms of sales, total assets and number of employees. These groups have better public credibility and are possibly highly regarded or respected by banking institutions, investors and other financing agents. Thus, they have less information asymmetry compared to the small and medium-scale enterprise firms which, as noted in the preceding section, have lesser access to financial institutions.

Extending our argument therefore, firm size will have a positive relationship with indebtedness (DE ratio), that is larger-sized firms with their information asymmetry advantage will have higher debt levels than small firms. Therefore, our hypothesis predicts a positive coefficient between firm size and DE ratio.

Rajan and Zingales (1995) examined the relationship for firms in seven major industrialized countries, but they did not obtain a universal significant result across the countries. On the other hand, previous empirical studies for Japanese firms consistently showed positive significant relationship between firm size and debt to equity ratio[10].

3. Hypothesis 3

Our third hypothesis involves the relationship between a firm's collateral value and debt to equity ratio.

In general, banks require borrowers to offer collateral to secure their loans. This is especially true when information asymmetry is significant. Collateral enable banks to cover agency costs and enable them to recover potential losses in case of borrower default and bankruptcy. Therefore, our hypothesis predicts that under a

[10] See Hirota (1999) and Ohta(2000), for example.

condition of information asymmetry between banks and borrowers, firms with larger collateral have higher debt to equity ratio.

Berger and Udell (1994) suggested that close relationship between banks and borrowers enable borrowers to obtain unsecured loans because such banks are more familiar about the latter's credit risk. Under such a situation, the collateral value of the firm is preserved, and it will have more absorptive capacity to obtain bank loans. This is of major relevance to the region since one of the features of East Asian industrial organization is complex of debt and credit payment in big business groups, as well as close relationship between lenders and borrowers.

4. Hypothesis 4

Our fourth hypothesis posits the relationship between firm's growth opportunity and debt to equity ratio.

Firms with high debt levels sometimes forego of an investment project in spite of expectations of high returns because of the reluctance of creditors to finance the project. Banks in general set DE ratio limits to borrowers in line with the need to curtail excessive liabilities to within prudent levels and to avoid financial distress to the firm. This practice therefore restricts higher debt exposure.

Our hypothesis suggests that borrowers will in general choose equity to invest in a growth opportunity rather than resort to borrowings in order to avoid a further increase in DE ratio. We also expect firms with high share prices to have a higher probability of raising funds through an equity or equity-related issue.

Behind our hypothesis, we assume that East Asian firms, located in economies that are export-oriented or have large domestic populations, have had a better growth opportunity than firms in the developed countries, which in general are mature markets. This area of investigation will determine if firms with high debt in the region enable themselves to lower their debt level by selecting equity finance to pursue a growth project.

III. Empirical Studies

3.1 Model

This chapter discusses the results of empirical studies of the firms in Indonesia, Korea, Malaysia, the Philippines and Thailand in light of the hypotheses presented in the foregoing section. The model is basically developed from that used in Rajan and Zingales (1995)

$$DE_{it} = const + \alpha_1 DE_{it-1} + \alpha_2 Y_{it} + \alpha_3 P_{it} + \alpha_4 MBR_{it} + \alpha_5 FIXED_{it} + f_i + d_t + \varepsilon_{it} \quad (1.\ 1)$$

DE_{it}: debt to debt plus market value of equity, Y_{it}: logarithm of net sales、P_{it}: EBITDA divided by book value of assets, MBR_{it}: ratio of book value of assets less book value of equity plus market value of equity all divided by book value of assets, $FIXED_{it}$: ratio of fixed assets to book value of total assets, f_i: firm's fixed effect, d_i: year effect, ε_{it}: error term

The dependent variable, DE ratio, is defined as the book value of liability divided by market value of equity plus preferred stock.

On the other hand, Y is the natural logarithm of net sales. Profitability is EBITDA divided by book value of assets. MBR is the ratio of the book value of assets less the book value of equity plus the market value of equity all divided by the book value of assets. FIXED is the measure of the firm's tangibility and is computed as the ratio of fixed assets to the book value of total assets. *f* and *d* are firm's fixed and year effects, and ε is an error term. The data was calculated for all the sample companies covering the period 1992-2001.

We employed the Generalized Methods of Moments (GMM) –first differentiated- estimation scheme introduced by Arellano and Bond (1991), which allows for the control of unobserved individual effects and endogeniety of explanatory variables, and the use of lagged dependent variables for the dynamic panel data. Dummy variable is not first-differentiated and is added as an exogenous variable.

3.2 Data

The study used corporate financial data of publicly traded corporations

compiled by Bloomberg L.P., an international financial information services provider, for the ten-year period between 1992-2001[11]. The study concentrated on industrial firms and therefore panel data excludes firms in the financial services industry (i.e., commercial banks, insurance, security firms, mutual fund, and others). It is noted that the panel data is unbalanced since the study covered a sample of listed firms that included newly listed and de-listed companies during the ten-year period. All the financial data are in terms of local currency. The sample firms are basically all the non-financial public firms in each of the sample countries.

We used two types of panel dataset, i.e., the first covering 1992-1996 and the second comprising 1997-2001 to capture and account for possible difference in capital structure relationships before and after the 1997 financial crisis. Dividing the sample firms into two periods and undertaking separate analyses may point to changes that could have been triggered by the Asian crisis.

Table 3 Number of the Sample Firms

	Indonesia	Korea	Malaysia	Philippines	Thailand
1992	119	608	329	N.A.	304
1993	137	613	369	178	331
1994	174	619	431	189	373
1995	184	638	473	205	400
1996	207	666	561	216	438
1997	225	681	646	221	415
1998	230	668	674	221	404
1999	229	649	694	226	378
2000	243	628	733	203	367
2001	N.A.	624	812	205	368

Source: Author calculated based on Bloomberg database.

[11] For the Philippines, data of 1992 have too many missing values. Therefore, sample period is

IV. Empirical Results and Discussion

4.1 Profitability and Capital Structure

Our empirical results presented in table 6 show that firm profitability (ROA), that is a proxy of the firm's internal funding ability as conceptualized by Myers and Majluf(1984), has a statistically significant relationship with DE ratio in all the sample countries. The results therefore support our hypothesis that the availability of internal funds in the firm dampens liability financing. A previous study of Rajan and Zingales (1995) showed that firm profitability has a negative relationship with debt to equity ratio in four of seven industrialized countries. In their model, equity is quantified in terms of market value[12]. Moreover, our empirical findings suggest that East Asian countries have a higher degree of dependency upon internal funds than those of the industrialized countries, as reported by Rajan and Zingales (1995).

The inverse relationship obtained in this analysis can be explained by the significant difference in the information cost between external and internal finance. In case there is a significant information asymmetry between insiders and outsiders, firms must depend on bank loans of external fund, and as a result debt to equity ratio becomes generally high.

Furthermore, since firms in all sample countries usually avail of one-year term loans -- the most common and easily available external funding source in the countries under study – the profitability immediately impact on interest coverage ability. It is also presumed that banks hedge borrower's credit risks in rolling-over short-term loan by monitoring its profitability during re-negotiations, possibly leading to lower information asymmetry between the insider and the creditor institution and greater influence by the latter in the management of the borrower.

Rajan and Zingales (1995) report a similar negative relationship between debt to equity ratio and profitability in MSEs in the United Kingdom. However, firms in the

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1993-2001. For Indonesia, sample period is 1992-2000.

[12] In case that equity is evaluated in term of book value in an empirical result of Rajan and Zingales(1995), there are three countries that have significant negative relationship between debt to equity ratio and profitability.

market-centered economy like the UK has few information asymmetry problems. Also, in comparison, firms in developed countries have more access to a greater variety of financing instruments with longer maturities and at lower rates, which give these firms more flexibility to efficiently manage operations for higher profitability.

4.2 Firm Size and Capital Structure

Large firms are generally considered to be financially and operationally stronger, and are consequently believed to have lower probability of bankruptcy. Therefore, banks allow them to hold higher levels of debt than smaller firms.

On the other hand, large firms are assumed to have more organized information disclosure system, and therefore hold a lower degree of information asymmetry in a capital market. They can more easily tap the equity market than MSEs, which generally are private corporations that have a high degree of information asymmetry. Therefore, they can secure funds from the capital market assuming all things equal since equity issuance is a more thorough and tedious process involving shareholder, legal and regulatory approvals, and thus forego debt financing.

In view of these two opposite but equally valid observations, our hypothesis allows empirical results that predict both a positive and negative relationship between capital structure and firm size.

Our analysis obtained significant relationship between firm size proxied by net sales and debt to equity ratio in Indonesia and Malaysia in both the pre-crisis period and post-crisis period, and in post-crisis Thailand and in pre-crisis Korea.

The above results are intuitively consistent with the business situation in Indonesia, Thailand and Korea, where there are several large business groups with diversified business portfolio that wield significant economic powers. In particular, the Korea empirical analysis shows significant positive result during the pre-crisis period, but yielded insignificant results after the crisis. The insignificant results in the post-crisis period may be explained by developments pursued in the country after 1997 in the form of corporate debt restructuring and reform that affected the chaebols, i.e., Big Deal and the Work Out, under the Kim Dae-Jung administration since 1999.

In the Indonesian sample, the positive relationship reflects the actual business situation in the country. Bank Indonesia permitted business conglomerates to establish commercial banks within a group in 1988, and this paved the way for concessional lending that led to the high debt exposure of the companies.

Our empirical study suggests that Malaysian firms are in a unique situation as reflected in the negative relationship between firm size and debt to equity ratio. Suto (2002) pointed out that corporate bonds issued by large Malaysian firms are mostly underwritten by major commercial banks that are also major players in domestic capital market. Given this perspective, the empirical result that large firms have lower DE ratio can be explained by the close relationship between borrowers and lenders and the smaller information asymmetry between borrowers and investors.

4.3 Firm's Tangibility and Capital Structure

As predicted by the Berger and Udell (1994) study, under the assumption that debtors and creditors do not have close relationship, there should be a positive correlation between debt and corporate collateral as represented by the Tangible Assets ratio, i.e., the ratio of fixed assets to the book value of total assets. Previous empirical studies by Rajan and Zingales (1995) supported this hypothesis in industrialized countries[13].

However, on the other hand, we obtained few significant empirical results for the five East Asian countries under study. Only post-crisis Thailand has a significant positive parameter in our study. Two factors may explain these results. The first is that the future value of liquidated tangible asset cannot cover the bank's agency cost, even when debtors and creditors do not have close relationship by institutional reasons. The second is that in fact, contrary to the declared assumption, debtors and creditors have close association with one another and information asymmetry is therefore low.

In the case of Indonesia, close relations between commercial banks and

[13] According to their study, six countries had significant parameter in case book value of equity is quoted, and five countries are significant when market value of equity is quoted for the definition of debt to equity ratio.

debtors also might contribute to the insignificant empirical test. In Korea, creditors in general avoid bankruptcy petition as a practice, with composition petition the preferred mode in the liquidation process. The small number of bankruptcy petitions seems to support the idea that a debtor's tangibility is insufficient to cover the agency cost in both countries.

4.4 Growth Opportunity and Capital Structure

A previous empirical study of Rajan and Zingales (1995) focusing on seven industrialized countries reported that market-to-book ratio (MBR), a proxy for a firm's growth opportunity, has significant negative relationship with DE ratio in almost all the countries under study. MBR is defined as the book value of assets less the book value of equity plus the market value of equity all divided by the book value of assets. The authors analyzed that this result came from a strong negative correlation between the number of equity issuance and MBR[14].

In contrast, our empirical study on the study yielded few significant negative relationships between MBR and DE ratio in all the sample countries prior to and after the crisis. To further analyze, we undertook piecewise estimation procedure to further shed light on the relationship between MBR and DE by using four quintiles of datasets, dividing the sample firms into four groups in terms of the number of issued and outstanding shares of stock. The procedure result showed weak significant correlation among firms with larger number issued stock and strong positive correlation for firms with smaller number of issued stock.

In spite of this trend, we found few significant test results between MBR and DE ratio across the four quartiles in the five sample countries. It appears that high stock price, per se, does not motivate firms to issue equity.

Summarizing on the above empirical results, it appears that firms in all the five sample countries acted with no clear pattern in so far as using equity finance in relation to their debt position. Companies in the region may have made the decision to raise

[14] In Rajan and Zingales(1995), no attempt to understand conclusion , in other words, firms issue equity it

capital using equity not solely on the basis of or irrespective of their share prices. In other words, other pertinent and more important factors may have come into play into the decision to use equity versus debt in pursuing growth projects, such as interest rates, the tedious legal and regulatory hurdles required to list and issue new shares, domestic appetite for new share issuances in the local stock market, etc.

Table 4 Result of Cross-sectional OLS estimate between DER of dependent variable and MBR of the independent variable MBR in the 4 different quintile of the number of stock issued in year 2001

		I	II	III	IV
Indonesia	N=211	-	-	14.190 ***	40.849 ***
Korea	N=631	-	-	18.208 ***	23.861 ***
Malaysia	N=630	-	-	2.098 ***	-
Philippines	N=118	-	-	-	-
Thailand	N=342	-	-	-	-

Note : 1) Quintile I-IV is indicated in descending order
2) ***, **, * indicate 1 percent, 5 percent, and 10 percent significant level

Table 5 Result of GMM estimate for panel data between DER of dependent variable and MBR of the independent variable MBR in the 4 different quintile of the MBR in 1992-2001

	I	II	III	IV
Indonesia	-	-	-	-
Korea	1.107 *	-	-1.740 **	-
Philippines	-	0.010 **	-	-9.711 ***
Malaysia	-	-	-	-
Thailand		-0.712 ***	-	

Note : 1) Quintile I-IV is indicated in descending order
2) ***, **, * indicate 1 percent, 5 percent, and 10 percent significant level, respectively
3) Sample period of the data is 1992-2000 for Indonesia and 1993-2001 for the Philippines.

is because whether to avoid higher costs of financial distress or stock price is high.

Table 6 Empirical Results

	Indonesia		Korea		Malaysia		Philippines		Thailand	
Variaple / Sample Period	I	II	I	II	I	II	I	II	I	II
DEt-1	-0.113	-0.427	0.441 **	0.029 ***	0.015	-1.013 ***	-1.381 ***	0.374 ***	0.033	0.215
	(-0.500)	(-1.290)	(2.470)	(3.140)	(0.110)	(-9.680)	(-9.460)	(2.440)	(1.670)	(0.410)
Yt	0.873 ***	1.237 *	1.959 *	-0.843	-0.698 **	-0.728 ***	0.042	-0.029	0.424	0.028 ***
	(3.680)	(1.770)	(1.670)	(-0.180)	(-2.150)	(-2.990)	(0.650)	(-1.380)	(1.180)	(3.220)
Pt	-0.039 **	-0.193 ***	-0.088 ***	-0.358 ***	-0.056 ***	-0.038 ***	-0.023	-0.010 ***	-0.019 ***	-0.029 ***
	(-2.400)	(-5.610)	(-3.480)	(-4.900)	(-7.230)	(-3.640)	(-0.670)	(-3.380)	(-12.110)	(-3.360)
MBRt	-0.201	-0.521	1.146 *	-0.006	-0.274	0.059	-0.156	-0.183	0.377 ***	0.084
	(-0.210)	(-0.390)	(1.890)	(-0.090)	(-0.430)	(0.820)	(-1.630)	(-0.793)	(4.420)	(0.150)
FIXEDt	0.051	-1.455	-1.023	-1.367	0.539	-1.777	-0.805	-3.320	-1.248	0.531 *
	(0.090)	(-0.240)	(-0.910)	(-1.060)	(0.990)	(-0.470)	(-0.170)	(-0.760)	(-1.630)	(1.940)
const	0.161	1.347	-0.559	-5.323 *	-0.417	-0.113	0.495	-0.044	0.025	-1.086 **
	(1.010)	(1.170)	(-5.110)	(-1.780)	(-1.050)	(-0.510)	(0.060)	(-0.330)	(1.180)	(-2.260)
Wald Test	31.640 ***	490.270 ***	22.800 ***	30.450 ***	62.470 ***	219.666 ***	8.310 ***	13.400 ***	213.380 ***	45.830 ***
SarganTest	21.450 ***	179.170 ***	49.080	28.370 ***	4.900	17.600 ***	0.770	51.940 ***	14.380 ***	18.600 ***
Arellano-Bond Test1	-1.690 *	5.140 ***	-1.811 *	-10.620 ***	-4.730 ***	1.920 *	-0.150	-3.170 ***	-4.310 ***	-9.010 ***
Arellano-Bond Test2	-1.320	-	-2.790 ***	0.130	-1.050	0.080	-	-1.160	-0.980	4.090 ***
Obervations	285	349	578	1477	570	570	137	192	478	553
Number of Firms	129	184	429	575	300	295	79	93	210	242

Note 1: ***, **, * indicate 1 percent, 5 percent, and 10 percent significant level, respectively.

Note 2: Sample Period I, 1992—1996, II, 1997—2001.

V. Conclusions

The determinants of firm capital structure in East Asian countries, as this paper found, are different from that in industrialized countries.

Cross-country investigation of the financing environment in each of the sample countries showed that firms in the region appear to have a pecking order in so far as their corporate finance decision-making is concerned. They have the highest preference for internal funds, with its characteristic smaller information cost, and secondarily for short-term bank loans. In general, banks exercise close monitoring of their debtor clients, which enable them to understand and anticipate credit risks. The generally close relationship between debtor firms and creditors appear to lower information asymmetry and may be one of the factors in the high dependency of firms on external bank loans.

On the other hand, the decision to use equity financing appears to be unrelated to the level of debt in firms in these countries. East Asian countries experienced explosive growth in their capital markets in the 1990s, which was however put to a halt after the 1997 financial crisis. Empirical results reveal that high share prices do not necessarily motivate firms to issue equity to raise funds.

Although firms in the sample countries commonly have high dependency on internal and short-term external funding, there also appeared heterogeneity between the five countries. Better understanding of corporate capital structure in the region may be achieved by enhancing this study in the future. First, future research should focus on obtaining more and longer-period data during the post-crisis period, when many institutional reforms were implemented.

A second area of investigation is the influence of the conglomerate or business group in corporate finance in this region and the changes that took place after the crisis. The conglomerate's group structure has not been revealed to the public and there is need to understand the relationship between information asymmetry and business group capital structure. The financial debacle of some large conglomerates in the wake of the 1997 crisis shows that there are lessons to be learned in proper corporate

finance practices in the region.

Appendix: Descriptive Statistics of the variables of sample firms

			Debt to equity ratio	Log Sales	ROA(%)	MBR	Tangibility
1992	Indonesia	Average	0.579	11.093	8.274	0.762	0.520
		S.D.	0.539	1.786	6.015	0.702	0.231
	Korea	Average	4.529	12.313	1.313	0.609	0.669
		S.D.	4.738	1.425	1.152	1.729	0.245
	Malaysia	Average	1.266	4.869	2.195	1.534	0.693
		S.D.	2.457	1.367	15.217	2.081	0.986
	Philippines	Average	N.A.	N.A.	N.A.	**NA**	**NA**
		S.D.	N.A.	N.A.	N.A.	**NA**	**NA**
	Thailand	Average	1.553	6.736	8.935	1.042	0.652
		S.D.	13.031	1.253	8.227	0.753	0.574
1993	Indonesia	Average	0.415	11.192	8.282	1.221	0.538
		S.D.	0.471	1.697	7.174	0.842	0.236
	Korea	Average	2.817	11.574	1.806	0.470	0.579
		S.D.	3.960	1.318	3.709	0.209	0.336
	Malaysia	Average	1.511	4.911	3.688	1.498	0.740
		S.D.	4.224	1.423	18.870	3.142	0.695
	Philippines	Average	1.189	6.338	5.346	2.365	0.624
		S.D.	4.239	2.246	11.515	2.076	0.353
	Thailand	Average	0.580	6.899	7.195	1.639	0.655
		S.D.	0.797	1.168	8.949	1.488	0.572
1994	Indonesia	Average	0.606	11.476	7.993	1.644	0.538
		S.D.	0.658	1.662	6.355	1.021	0.236
	Korea	Average	2.367	11.664	1.971	0.589	0.519
		S.D.	3.410	1.321	4.948	0.266	0.300
	Malaysia	Average	1.237	4.921	2.802	1.580	0.752
		S.D.	2.651	1.385	14.553	2.920	0.885
	Philippines	Average	1.949	6.377	4.102	1.719	0.649
		S.D.	9.592	2.202	15.601	1.817	0.436
	Thailand	Average	0.694	7.063	6.543	1.231	0.637
		S.D.	0.898	1.161	8.054	0.887	0.374
1995	Indonesia	Average	1.088	11.772	6.928	1.182	0.548
		S.D.	1.361	1.660	6.984	0.887	0.233
	Korea	Average	3.834	11.844	2.076	0.686	0.520
		S.D.	6.270	1.392	5.193	0.336	0.295
	Malaysia	Average	1.284	4.864	3.078	1.592	0.723
		S.D.	3.017	1.460	14.614	3.835	0.903
	Philippines	Average	1.386	6.464	5.597	1.546	0.689
		S.D.	9.142	2.222	46.085	1.450	0.734
	Thailand	Average	1.124	7.242	5.033	0.943	0.607
		S.D.	1.313	1.237	7.631	0.730	0.310
1996	Indonesia	Average	1.052	11.866	5.945	0.893	0.572
		S.D.	1.152	1.711	7.249	0.839	0.236
	Korea	Average	4.437	11.949	0.872	0.551	0.522
		S.D.	6.126	1.428	6.044	0.266	0.308
	Malaysia	Average	1.109	4.846	3.566	1.519	0.595
		S.D.	2.004	1.378	15.264	3.201	0.829
	Philippines	Average	1.348	6.406	2.613	1.754	0.741
		S.D.	8.104	2.499	14.797	2.526	0.848
	Thailand	Average	1.900	7.341	3.043	0.770	0.629
		S.D.	2.702	1.254	10.028	0.745	0.333
1997	Indonesia	Average	5.183	11.933	-3.597	0.932	0.556
		S.D.	7.451	1.864	15.576	0.696	0.250
	Korea	Average	15.210	12.014	-0.958	0.578	0.515
		S.D.	32.695	1.465	8.771	0.419	0.269
	Malaysia	Average	1.329	4.911	1.280	1.430	0.652
		S.D.	3.094	1.254	20.837	1.547	0.636
	Philippines	Average	2.484	6.432	-1.939	1.529	0.662
		S.D.	5.230	2.506	16.872	3.930	0.918
	Thailand	Average	11.450	7.366	-11.241	0.499	0.662
		S.D.	22.863	1.296	18.590	0.518	0.351
1998	Indonesia	Average	12.606	12.082	-6.754	0.581	0.554
		S.D.	25.692	2.092	23.441	0.557	0.250
	Korea	Average	15.472	11.948	-4.695	0.464	0.553
		S.D.	34.849	1.574	19.988	0.375	0.294
	Malaysia	Average	1.304	4.917	1.649	1.458	0.615
		S.D.	2.639	1.430	21.490	1.767	0.727
	Philippines	Average	2.559	6.378	-18.259	3.706	0.694
		S.D.	6.029	2.657	186.459	9.368	0.862
	Thailand	Average	10.177	7.263	-0.766	0.497	0.740
		S.D.	26.950	1.420	17.932	0.508	0.360
1999	Indonesia	Average	3.528	12.104	4.498	0.508	0.597
		S.D.	5.938	2.089	12.563	0.498	0.272
	Korea	Average	15.226	12.007	0.725	0.467	0.572
		S.D.	56.467	1.594	17.408	0.338	0.282
	Malaysia	Average	1.242	5.010	1.419	1.485	0.650
		S.D.	3.257	1.400	26.208	1.844	0.791
	Philippines	Average	3.825	6.274	-2.850	4.757	0.701
		S.D.	16.354	2.702	15.953	8.056	0.957
	Thailand	Average	3.901	7.246	-2.964	0.634	0.807
		S.D.	6.293	1.448	20.458	0.634	0.381
2000	Indonesia	Average	7.706	12.275	-4.383	0.917	0.593
		S.D.	16.589	2.029	26.664	0.773	0.295
	Korea	Average	16.916	12.130	0.681	1.802	0.587
		S.D.	57.288	1.603	18.065	28.978	0.274
	Malaysia	Average	1.435	4.952	0.422	1.491	0.625
		S.D.	3.087	1.513	27.393	1.825	0.809
	Philippines	Average	4.290	6.477	-2.680	1.464	0.774
		S.D.	9.221	2.595	13.959	6.399	0.630
	Thailand	Average	5.780	7.412	2.014	0.544	0.837
		S.D.	12.584	1.447	30.592	0.467	0.396
2001	Indonesia	Average	N.A.	N.A.	N.A.	N.A.	N.A.
		S.D.	N.A.	N.A.	N.A.	N.A.	N.A.
	Korea	Average	7.689	12.259	3.094	0.386	0.600
		S.D.	27.119	1.728	15.699	9.912	0.260
	Malaysia	Average	1.156	4.942	0.467	1.397	0.700
		S.D.	2.246	1.416	20.815	2.368	0.828
	Philippines	Average	4.649	6.394	-0.301	0.885	0.722
		S.D.	8.482	2.898	17.597	0.880	0.364
	Thailand	Average	1.952	8.258	7.460	0.747	0.845
		S.D.	4.060	1.194	13.400	0.602	0.386

All are calculated for all non-financial companies reporting B/S and P/L in 1992-2001. Definition is subject to that indicated in page 15.

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