

Fukino Project
Discussion Paper Series

No.015

**Institutional Change and Corporate Financing in Indonesia:
Estimating the Effects of Social and Political Factors on Capital Structure**

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December 2009



Hitotsubashi University Research Project of Policies for East Asia

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December 14, 2009

Abstract

This study investigates the factors determining the capital structure of Indonesian listed companies before and after the implementation of economic reform policies subsequent to the 1997-1998 Asian financial crisis. The estimation analysis of the panel data for the period 1994-1997 and 2000-2006 reveals several factors that determined substantive change in the financing activities of these listed companies. The capital structure of Indonesian companies had not been explained sufficiently by the standardized theory of corporate financing, which had not considered the effects of the specific social and political elements as well as business conglomerates, before the Asian financial crisis. However, the capital structure of Indonesian companies became fitted more to the corporate financing theory, after the influence of social and political factors of corporate attributes weakened substantially following the post-crisis reform policies. This significant change is considered to result from institutional change caused by the financial and corporate reforms in the post-financial crisis era.

Keywords: Corporate Finance, Capital Structure, Ethnic network, Indonesia
JEL Categories: G32, G34, G38

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1. Introduction

Stable economic growth requires a sound and efficient institutional structure. However, in developing countries where formal economic institutions are not sufficiently developed, informal institutions and codes of economic behaviors play important roles that compliment the formal institution (North, 1990). While these functions of informal institutions have an economic rationality to a certain extent, they are criticized as the major cause of the collusion between banks and companies as well as political influence on economic activities.

It was generally recognized that any weaknesses in corporate finance, such as collusion between banks and companies to facilitate excessive borrowing, were critical factors that aggravated the Asian financial crisis in Indonesia. The Asian Development Bank (1999) and Hill (2000) offer comprehensive views of the Indonesian financial sector. Claessens et al. (2000) and Hanazaki & Liu (2003) investigated the background and impact of the Asian financial crisis using econometric analysis.

To achieve a sustainable system, Indonesia promoted structural reforms in corporate financing via the Indonesian Bank Reconstruction Agency (IBRA) and the Jakarta Initiative. Public funds were injected into the banking sector, to dispose of non-performing claims in the course of management reorganization in the wake of resignation and consolidations. In the corporate sector, where excessive borrowing and over investing had become serious problems, many large conglomerates faced a financial crisis and had to restructure their business groups. In order to tighten the management disciplines of banks and companies, and thereby improve the financial system as a whole, the government implemented a series of banking reforms and corporate governance reforms in response to the crisis of 1997-98.

Governments have often conducted major economic reforms after an economic crisis. However, the effects of reform are limited since the social code of behaviors and the informal institutional framework are not addressed by the reform and survive long after the change of formal institutions (North, 1990). In the case of Indonesia, some studies suggested that the reform policy was not effective in changing the companies' behavior. Sato (2003) conducted case studies of specific business groups to clarify their ownership structures.

While the effectiveness of economic reforms has important policy implications, the authors have found no formal econometric study examining how Indonesian corporate financing changed as a result of the financial reforms implemented in response to the crisis¹. This study analyzes the financing structure of listed companies in Indonesia before and after the Asian financial crisis, examining whether their corporate financing activities changed after the reform policies were implemented. To this end, several types of debt ratios for companies listed on the Jakarta Stock Exchange are estimated, the applicability of standardized theories of corporate finance to Indonesian corporate financing is examined, and the influence of Indonesia's unique social and political factors on corporate financing is investigated. The study covers the thirteen years period from 1994 to 2006, a span that includes both pre-crisis years (FY 1994 – FY 1997) when the

¹ Taridi (1999) was a pioneering study investigating the capital structure of listed companies in Indonesia before the Asian financial crisis. Among the few formal empirical studies on ASEAN countries are Mieno (2006), Suto (2003), and Wiwattanakantang(1999).

economy was flourishing under the old regime, and post- crisis years (FY 2000 - FY 2005) when the economy was recovering from chaos through a series of economic reforms.

This study is, first and foremost, a fact-finding endeavor to track the changing corporate financing behavior of Indonesian listed companies during the period from 1994 to 2006. Specifically, this study focuses on four questions. First, did the financing behavior of listed companies change as a result of the reforms implemented after the Asian financial crisis? Second, if so, what were the major differences in corporate financing pre- and post-crisis? Third, how did the post-crisis reforms modernize the financial behavior of listed companies? Finally, based on the financial activities of the listed companies identified, what are the implications for future corporate financing policies in Indonesia?

This study consists of six sections. Section 2 presents theoretical views for analyzing the financing activities of listed companies in Indonesia, based on the adjusted Modigliani-Miller theory (trade off theory) and agency cost theory. Section 3 describes the characteristics of listed companies in Indonesia and the reform policies conducted in the Asian-post-crisis period. Section 4 describes the methodology adopted to perform econometric analysis and the data set used for estimation. Section 5 analyses in regression the determinants of the capital structure of listed companies, using the panel data of individual listed companies. Section 6 summarizes the discussion of previous sections, and based on our study results discusses the policy tasks for the consolidation of Indonesia's corporate financing system.

2. Analytical Scope of Listed Companies in Indonesia

2.1 Adjusted Modigliani-Miller Theory and Agency Cost Approach

According to the Modigliani and Miller (1958) theory (hereinafter referred to as the "MM theory"), corporate value does not depend on capital structure; thus, corporate financing has no impact on corporate value when several conditions exist together: a complete capital market, perfect information, no corporate tax, no transaction cost, and no economic externality. However, the full set of preconditions of the MM theory is not likely to exist in the real world; therefore, an adjusted MM theory is required. According to the trade-off approach, companies choose the optimal capital structure that minimizes the cost of capital so as to maximize the value of the company, in consideration of a risk of bankruptcy and the impact of corporate tax. The higher the company's debt ratio is, the lower its average capital cost becomes. However, when the debt ratio is high, the risk of bankruptcy also becomes high, resulting in a higher risk premium. The optimal debt ratio is associated with maximum corporate value².

According to the agency cost approach, determinants of corporate value (which are the determinants of optimal corporate capital structure) are also affected by agency cost, taking into account asymmetric information. Since Jensen and Meckling (1976), two of the types of conflicts of interest that generate agency cost have received priority: relationships between shareholders as principals and management executives as agents; and relationships between creditors as principals and shareholders as agents.

² See Myers and Majluf (1984) for details.

The agency cost due to the relationship between shareholders and management executives arises from the executives' pursuit of personal profits and the shareholders' desire to maximize corporate value. This issue could be solved by raising the corporate debt ratio and by decreasing management access to free cash flows. Meanwhile, the agency problem between creditors and shareholders arises from the shareholders' desire to receive good dividends by appropriating borrowed money or by making management undertake high risk/high return investments using the limited liability system. In the case of the latter conflict, lowering the corporate debt ratio is one solution to enhance corporate value.

One of the characteristics of listed companies in Indonesia is their highly concentrated ownership structure. Therefore, we can equate management executives and major shareholders in our description of the principal-agency relationship for listed companies in Indonesia. Shareholders have ultimate control over management, so the conflicts of interest between management executives and major shareholders are limited (Sato, 2003). Even the largest major companies are controlled by small numbers of shareholders or tycoon families; therefore, the agency cost problem between management executives and major shareholders is very serious. The public-offering ratio is not very high, and therefore control over management by major shareholders is typical, even in the case of listed companies.

The existing studies show that information disclosed by companies listed in Indonesia is relatively low. As a result, there is high asymmetric information between outside creditors and management executives (major shareholders), and the agency cost is also consequently high. Therefore, a serious agency cost problem related to fund-raising is likely between outside creditors and management executives (major shareholders), or between small shareholders and management executives (major shareholders).

Where there is a serious agency cost problem between creditors as principals and management executives as agents (major shareholders), the agency cost becomes high if funds are raised by borrowings. Therefore, high-profit companies with high retained earnings tend to reduce external borrowing. A company's capacity to provide collateral is also critical as a factor determining agency cost. The larger the fixed assets that are used as collateral, in comparison to debt, the more the company's agency cost is reduced. Therefore, companies with large collateral tend to have a high optimal debt ratio. When financing by means of borrowed funds, a company's market visibility is another critical factor. The higher the market visibility is, and the more widely corporate management is known, the lower asymmetry of information is. When the business scale, the sales volume, and the asset size are larger, the agency cost between creditors and the company is lower and the optimal debt ratio is higher.

2.2 Informal Codes of Business Behaviors and Networks

2.2.1 Business Conglomerates and Foreign Joint Ventures

In developing countries where financial and legal systems are underdeveloped, there is considerable constraint on financial activities. Consequently, a tendency has arisen to expand activities by borrowing funds externally through the development of quasi markets where information sharing is easy and the agency cost problem is considerably negligible. With such quasi markets, the company is likely to enjoy an advantage in mitigating the agency cost of differentiating its financing activities.

For example, a company within a business group can raise funds from a bank in the same group at a relatively low cost, so the optimal debt ratio is high. This results from three factors: the asymmetry of information between the companies and a bank in the same business group is low; companies within the group enjoy favorable loan terms as compared with companies on the outside; and companies within the group can count on more cooperation from a bank, especially if they experience financial difficulties.

It is often said that one of the reasons why business conglomerates are formed in developing countries is their advantage in financing risk money with the aid of internal capital markets. Funds from internal capital markets act as internal funds for companies within the group, allowing business risks to be absorbed into the funds. In particular, the core business in a group is expected to function as the borrower of external funds, so its dependence on debt is apt to be higher than the optimal level for a non-consolidated company. Foreign companies may take different financing routes compare to other companies. A foreign company is generally owned and managed by its parent company and a local partner. The management information of a foreign company's local subsidiary is shared with the parent company in its home country and so the agency cost problem is negligible between the two. Accordingly, fund raising through the parent company bears an agency cost that is as low as that achieved through internal funding. Thus, the capital expenditures of foreign companies are often funded through investment by the parent company.

2.2.2 Informal Business Networks Based on Socio-Political Networks

The agency cost of external borrowings may be affected by political and social factors, such as the ethnic connections or family relationships of management executives (major shareholders) as well as a "revolving door" or other relationships with the government. Generally, the asymmetry of information between outside investors and the managers of a company is increased in developing countries where information disclosure and legal systems are less robust than in advanced countries; thus, the political and social factors can mitigate or prevent impediments. In reality, the power of contracts is perceived to be high when the contracting parties share the same social and cultural background, because there is a shared code of conduct that leads to significant social penalties ("loss of face") for contractual defaults (debt defaults) when contractors share the same social and cultural backgrounds.

One example of these factors at play is the difference between ethnic Chinese companies and non- ethnic Chinese local companies. There are common cultural and social rules for ethnic Chinese companies and ethnic Chinese banks³. Conversely, the cultural and social rules differ between ethnic Chinese companies and non-Chinese banks; therefore, they may have difficulty maintaining a relationship of mutual trust. If an ethnic Chinese company is financed by a non-Chinese bank, the loan terms might be less advantageous.⁴ In any case, when an ethnic Chinese company borrows money externally,

³ Okuda (2004) show that social and cultural background may affect the information production conducted by banks in Malaysia.

⁴ Several studies survey if there is a trusting relationship between Chinese companies and non-Chinese banks. Andrew (2008) points out this issue. See Sato (2003) for the relationship between Chinese companies and the government of Indonesia.

its agency cost may differ from that borne by a non-ethnic Chinese local company, due to the disparity of social, cultural, and political background rules.

The agency cost arising in regard to creditors also depends on whether the company is government-linked. If a company is recognized in the market as being supported or guaranteed implicitly by the government, the risk for creditors in financing that company is mitigated. In the case of government-linked companies, information sharing through the government may minimize the asymmetry of information when dealing with government-linked banks. In any case, government-linked companies may have an agency relationship with creditors different from that experienced by the private sector in general, so their capital structure can have characteristics that are different from the structure typically seen in private companies.

2.3 The Effects of Reform Policies after the Asian Financial Crisis

After the Asian financial crisis, a wide range of financial and corporate reform policies were implemented. First, public funds were injected for the liquidation of the failed banks that had been severely affected by the Asian financial crisis, those banks' non-performing loans were settled by the IBRA, and the external debt problems of individual companies were solved with the help of the Jakarta Initiative. These measures dismantled the special ownership structure between banks and business conglomerates, that is, the endemic collusion between banks and business conglomerates that were deemed to have aggravated the financial crisis (Claessens, 2000)⁵.

Second, for maintaining healthy bank management, the prudential regulations for banks were made more stringent, the monitoring power of the monetary authority over banking activities was enhanced, and the previously low enforcement capability was strengthened. Under the tightened regulations, the responsibility of bank managers came to be critically linked to the sound banking operations, and it became difficult for bank managers to exploit their private benefit and direct the profit to a specific company.

Third, in parallel with the reform of the banking sector, corporate governance regulations for listed companies were tightened, and legal mechanisms to handle problems such as bankruptcy were developed. The reforms include the improvement of information-disclosure, which was necessary to strengthen the corporate governance of stockholders in the capital market, and the modernization of bankruptcy laws, which was necessary to strengthen the corporate governance of external creditors.

The restructuring of capital structures and reform of the financial systems instituted new management disciplines to prevent collusion between banks and private companies, and thereby exercised considerable influence over corporate financing. If these measures successfully modernized the country's corporate financing, analysis would show that the influences of social and political factors on the funding of listed companies would be weaker after the Asian financial crisis. On the other hand, if the measurements were not effective in changing financing attitudes, social and political factors would still be recognizable in the post-crisis data.

3. Listed Companies in Indonesia

3.1 Corporate Attributes and the Classification Method of Listed Companies

⁵ It was recognized that the enterprise that falls into the excess indebtedness had received the financing from the bank in the same business conglomerates.

The advantages to this approach to analyzing the listed companies include the following¹. First, the available financial data are far more refined than those of unlisted companies, so that an in-depth analysis based on the framework of economics becomes possible. Second, consistent long-term control of the corporate data of various industries leads to a comprehensive overview of corporate finance profiles. The method of this study and the knowledge provided by previous case studies are complementary approaches, which in combination are expected to greatly expand and deepen the understanding of this field. Third, more than half of the major private companies included in the top thousand companies by sales ranking are listed on the Indonesian stock market. This means that the presence of major private companies reflects an importance that is not to be undervalued in the corporate sector or in Indonesia's economy, despite their limited number (Sato, 2004). Accordingly, a thorough analysis of the financing activities of listed companies is an essential process for studying issues of consolidating corporate finance.

According to the discussion in the previous section, we classified the listed companies into several groups based on their corporate attributes. First, in the classification of ownership structure, the major shareholders of each company are categorized as Pribumi (so-called "native" Indonesian or ethnic Malay), the ethnic Chinese, the foreign joint-venture, the ethnic Indian, or government controlling companies, on the basis of their family names. Therefore, the attribute of the shareholders who have the largest number of shares becomes the corporate ownership attribute. When a company's holding company is the largest shareholder, the ownership structure is classified as Pribumi, the ethnic Chinese, the foreign joint-venture, the ethnic Indian, or government controlling companies, on the basis of the family name of the holding company's largest shareholder.

Second, when a company belongs to a business conglomerate, its importance and centrality are classified on the basis of three standards. A company is classified as a "core company" within the conglomerate only when: the directors are not professional managers but family members who own the business conglomerate (or its holding company); the scale of the company is significantly large within the business conglomerate; and the industry of the company is central to the conglomerate. Companies that satisfy only two of these three standards are classified as a "major company" within the business conglomerate.

Third, the impact of the Asian financial crisis is undeniable as a special factor affecting the financing of listed companies in Indonesia. Companies that underwent reconstruction after the crisis may, in contrast to other companies, have been supported in various ways to reduce their debts. Consequently, they enjoyed an advantage over unsupported companies in regard to debt reduction, which results in a difference in capital structure attributable to policy factors. In particular, their proportion of bank borrowing used mainly for short-term funding is relatively low compared to that of other companies; in fact, it was greatly reduced during the time when these companies were undergoing reconstruction. A company belonging to the same business conglomerate both before and after the Asian financial crisis was classified as a "non-restructured company." A company belonging to a different business conglomerate after the Asian financial crisis was classified as a "restructured company."

3.2 The Fund-raising Structure of Companies with Different Corporate Attributes

When we looked at the ownership attributes of listed companies, ethnic Chinese companies accounted for the largest share both before and after the Asian financial crisis. According to the number of companies, the share of the total number of listed companies occupied by ethnic Chinese companies, the foreign joint venture companies, Pribumi companies, government controlling companies, and ethnic Indian companies were 64%, 20%, 10%, 5%, and 2%, respectively. According to the asset size of companies, the share of total assets of all listed companies occupied by ethnic Chinese companies, the foreign joint venture companies, Pribumi companies, government controlling companies, and ethnic Indian companies were 42%, 27%, 23%, 6%, and 2%, respectively. The averaged asset sizes of the ethnic Chinese and Pribumi companies were smaller than those of foreign joint venture and government controlling companies.

The financial characteristics of listed companies are summarized according to different ownership attributes in Table 3-1. The ratios of debt to total assets (debt ratios) of listed companies tended to increase before the Asian financial crisis, while it decreased after the crisis⁶. The debt ratios of the ethnic Chinese companies and the ethnic Indian companies were almost always higher than those of Pribumi companies, and the debt ratios of foreign joint venture companies were similar to those of the ethnic Chinese companies. After the Asian financial crisis, the long debt ratios and the ratio of bank borrowing substantially decreased, and these ratios fluctuated widely for the government controlling and Pribumi companies.

(Table 3-1) Comparison of Listed Companies by Ownership Attributes

The ratios of before-tax profit to total assets (profit ratio), which represented the companies' capability to earn profits, gradually decreased after the Asian financial crisis, then it turned to recover after 2004. The profit ratio of foreign joint venture companies and government controlling companies were higher than those of other companies, and the before-tax profit ratios of ethnic Chinese companies and Pribumi companies were at similar levels.

The ratios of fixed assets to total assets (fixed asset ratio), which represented the companies' ability to provide collateral, of ethnic Indian companies were the highest, and those of Pribumi companies were the lowest. The fixed assets ratio did not differ so much among government controlling companies, ethnic Chinese companies, and foreign joint venture companies.

The difference in the financial characteristics between core companies and non-core companies belonging to business conglomerates are summarized in Table 3-2. There was a tendency for the debt ratios and long-term debt ratios of core companies to be higher than those of non-core companies, while the bank borrowing ratios of core companies were lower than those of non-core companies. The fixed asset ratios of core companies were higher than those of non-core companies. These tendencies did not change before and after the Asian financial crisis. While the profit ratios of non-core companies were higher than those of core companies before the Asian financial crisis, the difference in the profit ratios between core and non-core companies disappeared after the crisis.

⁶ After the Asian financial crisis, some listed companies had the amount of the debts exceeding their assets. Those companies are excluded from the sample of data for econometric study in the following sections.

(Table 3-2) Comparison of Core and Non-core Companies

The comparison of restructured and non-restructured companies is summarized in Table 3-3. There was no significant difference in debt ratios, long-term debt ratios, and short-term debt ratios between restructured and non-restructured companies before the Asian financial crisis. Since the restructured companies' finances were remedied through debt reduction, the debt ratios of these companies became lower than those of non-restructured companies after the financial crisis. However, as the Indonesian economy recovered, the difference in the debt ratios between restructured and non-restructured companies disappeared until 2003, and the debt ratio of non-restructured companies became lower than those of restructured companies.

(Table 3-3) Comparison of Restructured and Non-restructured Companies

Before the Asian financial crisis, there was no significant difference in profit ratios between restructured and non-restructured companies. After the crisis, the profit ratios of restructured companies became lower than those of non-restructured companies. Meanwhile, as the economic recovery progressed, the difference in the profit ratios between restructured and non-restructured companies ended.

4. Methodology

We used the following method to analyze the hypotheses described in Section 2. First, we estimated the capital structure of the listed companies in Indonesia by using a fixed-effect unbalanced panel model. The objectives were to estimate effects of the several economic variables, corporate tax and business-risk, explained by the trade off approach; and the creditworthiness and ability to provide collateral explained by the agency costs theory. The characteristics of each company are contained by the fixed effects in the estimation. Second, we regressed the fixed effects (obtained by the first estimation) to the dummy variable estimators representing unique characteristics of the Indonesian companies. Regression of the fixed effects enables us to observe how the characteristics of each company affect its capital structure. We also analyzed the pre-crisis and post-crisis differences at both of the above steps of analysis (first-step regression and second-step regression).

4.1. Empirical Model for Debt-Ratios and Economic Variables

We estimated three types of debt-ratio. The empirical model is expressed as equation (1), where DR_{kit} is type k debt-ratio for i -th company at time $t-1$, α_i is the fixed-effect for i -th company, X_{ijt-1} is the explanatory variables for i -th company at time $t-1$, β_j are the coefficient of X_{ijt-1} , and ε_{it} is the random error term for i -th company at time t . The explanatory variables include the followings; RE_{it-1} is the free cash flow for i -th company at time $t-1$, TAX_{it-1} is the rate of corporate tax for i -th firm at time $t-1$, FIX_{it-1} is the ability to provide collateral for i -th company at time $t-1$, $SIZE_{it-1}$ is the creditworthiness for i -th company at time $t-1$, $RISK_{it-1}$ is the business-risk for i -th company at time $t-1$. AF is the dummy variable for the post-crisis period, BM is the dummy variable for the mini-boom period since 2004, $YD1996\sim YD2005$ are the year

dummies. We used cross terms of *AF* (or *MB*) and each variable (except year dummies) to observe the change of economic structure from pre-crisis to post-crisis (or from pre-mini-boom to post-mini-boom) period. To rule out simultaneity between the explanatory variables and the dependent variables, the values of RE_{it-1} , TAX_{it-1} , FIX_{it-1} , $SIZE_{it-1}$, and $RISK_{it-1}$ are one period prior time to DR_{kit} .

$$(1) DR_{ijt} = \alpha_i + \sum_{j=1}^m \beta_j X_{ijt-1} + AF \cdot \sum_{j=1}^m \beta_j X_{ijt-1} + BM \cdot \sum_{j=1}^m \beta_j X_{ijt-1} + \sum_{k=1}^n \beta_k YD_k + \varepsilon_{it}$$

(1) Dependent Variables

We estimated by using three types of debt-ratio as independent variables; *TDR* =the total debt ratio (total liabilities/total assets), *LDR* = the long-term debt ratio (Long-term liabilities/total assets), *SDR* =the short-term debt ratio (short-term liabilities/total assets).

The total debt ratio shows the rate of liabilities to all capital. It is the most basic index for capital structure. It is essential to observe the total debt ratio to analyze how corporate tax and business risk affect a company's capital structure, because these two variables affect any debt.

There is a difference between short-term debt and long-term debt. Short-term debt like accounts payable and notes are used for short-term objectives like cash flow. Long-term debt is used for long-term objectives like capital expenditures (e.g., investments financed by long-maturity instruments). Because both lender and borrower are firms, there is less asymmetrical information when short-debt like accounts payable is used, than when other financial devices are used. On the other hand, there is more asymmetrical information when long-term debt is used. The agency cost associated with long-term debt has a stronger effect than that associated with short-term debt.

We predicted that the short-term bank debt ratio would be different from the total debt ratio and long-term debt ratio, because banks are the most important creditors and have a superior ability to get information about borrowers.

(2) Explanatory Variables

The following explanatory variables and their definitions apply to equation (1).

RE: The rate of retained earnings is defined as (retained earnings) / (total assets). We used it as a proxy of free cash flow. While profit rates like return on assets are frequently used in other studies, we used the rate of retained earnings because it seems more stable than profits rates. Free cash flow incurs less agency cost than other financial sources. The greater the company's free cash flow, the less agency cost incurs. It was expected that the sign of *RE* would be negative.

TAX: The rate of corporate tax is defined as ((profits before tax – profits after tax)/total assets). We used it as a proxy of the effect of corporate tax. Although the corporate tax rate of each individual firm is often used in other studies, corporate tax rates do not include deferred tax assets and tax-premiums. Considering this point, we calculated the tax rate as described and used it as a proxy. A high rate of corporate tax makes a firm increase its debt ratio in order to reduce the tax payment. Therefore, it was predicted that the sign of the rate of corporate tax would be negative.

FIX: The ratio of fixed assets is defined as (tangible fixed assets)/(total assets). We used it as a proxy of the ability to provide collateral. Tangible fixed assets are easy to pledge as collateral and thus decrease agency costs of borrowing. The more tangible the

firm's assets, the greater its ability to issue secured debt and the less information it has to reveal about future profits. Therefore, it is predicted that the sign of the ratio of fixed assets would be positive.

SIZE: The firm's size is defined as the natural logarithmic of total assets. We used it as a proxy of the creditworthiness in the market. The more visible the company is, the lower its agency costs and the more debt it can issue. It was predicted that the sign of a firm's size would be positive.

RISK: The business risk is defined as the deviation of the absolute values of the operating losses divided by total assets, from 1994 to 1997 and 2000 to 2003⁷. The volatility of a company's stock price or profits is often used as a proxy of business risk. However, due to the characteristics of the stock market in Indonesia, there is a tendency for well-performing listed companies to have a wide fluctuation in their stock price or profits. To avoid this problem, we determined the business risk from the level of losses. In other words, the more business risk the firm has, the greater the risk of bankruptcy and the creditors suffering losses. It was predicted that the sign of company's business risk would be negative.

YD1996 ~ YD2003: Year dummy variables were created for each year. We used this dummy to control the change in macroeconomic environments.

AF: The crisis dummy variable is defined as 0 if the year is 1998 or earlier, and 1 if the year is 1999 or later. We used this dummy to observe the change after the financial crisis.

BM: The mini-boom dummy variable is defined as 0 if the year is 2004 or later, and 1 if the year is 2003 or earlier. We used this dummy to observe the change after the mini-boom since 2004.

4.2 Empirical Model for Fixed Effects and Corporate Attributes

We regressed the fixed effects $\hat{\alpha}_i$, which were obtained by equation (1), on independent variables and the corporate specific attributes explained in Section 2 as explanatory variables. We calculated $\hat{\alpha}_i$ from the estimation results of three different types of debt ratios; the total debt ratio, the long-term debt ratio, and the short-term debt ratio.

The empirical model is expressed as equation (2), where C is the constant term, A_{ij} is the dummy variable for the corporate attributes of i -th company, γ_j is the coefficient of A_{ij} , δ_j is the coefficient of the cross term of A_{ij} and the post crisis dummy variable AC , ID_j is the dummy variable for each industry, η_j is coefficient of ID_j , m is the number of corporate attributes, n is the number of industries, and μ_i is a random error term.

$$(2) \quad \hat{\alpha}_i + \varepsilon_{it} = C + \sum_{j=1}^m \gamma_j A_{ij} + AC * \sum_{j=1}^m \delta_j A_{ij} + \sum_{j=1}^n \eta_j ID_j + \mu_i$$

We used the following dummy variables for the ownership structure, the core company of a business conglomerate, and the post-crisis restructuring, which are all explained in

⁷ We calculated it by including data from times when the firm's retained earnings were negative.

Section 3. In addition, we used the dummy variables for industries as control variables. The categorization of industries was based on ECFIN (2003).

Ownership attributes: According to the classification in Section 3, we used the dummy variables for the ownership structure, including dummy variables for Pribumi, the ethnic Chinese companies (*EthnicChinese*), the foreign joint-venture companies (*Foreign*), the ethnic Indian companies (*EthnicIndian*), or government controlling companies (*Government*). The value of each ownership structure is 1 if the firm fits its category, or 0 if the firm is not identified by the category⁸.

Core company of a business conglomerate: According to the classification in Section 3, we used the dummy variables for the core business companies (*Core*). The value of core business companies is 1 if the firm fits its category, or 0 if the firm is not identified by the category.

Post-crisis restructuring: According to the classification in Section 3, we used the dummy variables for the restructured companies (*Restructured*). This categorization of a company as restructured or not depends on whether it changed its business group after the Asian financial crisis. Specifically, if the company belonged to the same business group in 2003 as it did in 1997, it is classified as non-restructured; otherwise, it is considered a restructured company. The value of restructured companies is 1 if the firm fits its category, or 0 if the firm is not identified by the category.

4.3 Data Description

We analyzed the listed companies that were not financial companies. The data related to financial statements includes values from 1994 to 2005, and the data related to corporate attributes is as of 2003.

The financial statement data from 1994 to 1995 and 2003 to 2005 are based on the *Indonesia Financial Market Directory* (1996, 1997, 2003, 2004, and 2005 editions), published by the ECFIN. The data from 1996 to 1997 was taken from the JETRO-IDE database of the Institute of Developing Economies, Japan External Trade Organization⁹. Data from 1998 to 1999 was omitted because of the Asian financial crisis. Samples whose retained earnings were negative were excluded as abnormal values. In order to avoid simultaneity, we used the explanatory variables for a period prior to the dependent variables.

Table 4-1 shows the basic statistics of dependent and explanatory variables and the correlation coefficients between them. There is no especially high correlation coefficient.

(Table 4-1) Basic Statistics and Correlation Matrix

5. Estimation Results

5.1 Estimated Results of Debt Ratios

Table 5-1 shows the estimation results of equation (1), which represents the effects of economic factors on the capital structure of listed companies. For the total debt ratio, long-term debt ratio, and short-term debt ratio, according to the Hausman test, the fixed effect model was selected. Most of the coefficient estimators were statistically significant

⁸ The categorization incorporates information on the business status of listed companies obtained through a series of interview at P. T. Nomura Indonesia, a local subsidiary of Nomura Securities Co.Ltd.

⁹ This database was created by Yuri Sato and Miki Takeda of Institute of Developing Economies, Japan External Trade Organization.

and followed their expected signs. The adjusted *R*-square values were higher than those in the previous works examining capital structure of ASEAN companies, and the *F*-values were large enough. Overall, we obtained satisfactory results for the cost function estimation.

(Table 5-1) Estimation Results of Debt Ratios

Before the Asian financial crisis, the estimation results of debt ratios were not well consistent with the corporate financing theory explained in Section 2. The coefficients of many explanatory variables had the sign contrary to the theoretical expectation, or they were statistically insignificant. This observation suggests that corporate fund tapping activities in Indonesia before the Asian financial crisis differed from those predicted by standardized corporate financing theory.

In the estimation of total debt ratio before the Asian financial crisis, only the coefficient estimate of the rate of retained earnings (*RE*) was statistically significant and consistent with the theoretically expected sign, that is, negative (-0.077). However, the coefficient of corporate tax (*TAX*) was a significantly negative value (-0.468), which was inconsistent with the theoretical expectation. The coefficient estimates of other variables, i.e., the business risk (*RISK*), the firm's creditworthiness (*SIZE*), and the fixed assets ratio (*FIX*) were statistically insignificant.

The estimated results of the long-term debt ratio were more consistent with the theoretical expectation. The coefficient of the business risk (*RISK*) was significantly negative (-0.098), the coefficient of the rate of retained earnings (*RE*) was significantly negative (-0.078), and the coefficient of the firm's creditworthiness (*SIZE*) was significantly positive (0.085), all of which were consistent with the expectation of corporate financing theory.

The estimation result of short-term debt was not consistent with the theoretical expectation at all¹⁰. The coefficient estimates of the business risk (*RISK*) was significantly positive (0.103), while the coefficient of the corporate tax (*TAX*) was significantly negative (-0.285), the coefficient of the fixed assets ratio (*FIX*) was significantly negative (-0.097), and the coefficient of the firm's creditworthiness (*SIZE*) was significantly negative (-0.064). These results were all opposite to the theoretical prediction.

After the economic reforms in the post Asian financial crisis, corporate fund tapping activities in Indonesia changed into theoretically expected post-crisis activities. The estimation results of the debt ratio, long-term debt ratio, and short-term debt ratio, proved to be much more consistent with the expectation of corporate financing theory. This suggests that the economic reforms modernized the corporate fund raising activities in Indonesia, which were explainable by economic rationality under the modernized institutional frameworks. We found that the strengthened prudential regulation implemented after the crisis and the modernized bankruptcy law had the affect of making

¹⁰ The estimation result of short-term bank borrowing ratio was not well consistent with the corporate financing theory both pre- and post-crisis periods. In the estimation of short-term bank borrowing ratio (see Table A1 in the appendix), the coefficients of most explanatory variables have the sign opposite to the theoretical expectation, or they were statistically insignificant. This observation suggests that the short-term fund raising activities of listed companies were influenced temporally by ad hoc factors during the entire study period.

the fixed assets ratio consistent with the corporate financing theory.

In the estimation of the debt ratio, the coefficient of the post-crisis dummy and the cross term of corporate tax ($AF*TAX$) had a significantly positive values (0.486) and the coefficient of post-crisis dummy and fixed assets ($AF*SIZE$) had a significantly positive values (0.124). This implies that, after the Asian financial crisis, the influence of tax and fixed assets ratio on debt ratios became consistent with the standard theory of corporate financing¹¹. The coefficient of the post-crisis dummy and the rate of retained earnings ($AF*RE$) had a significantly negative value (-0.112), while the coefficient of the post-crisis dummy and the firm's creditworthiness ($AF*SIZE$) had a significantly positive values (0.034). This implies that, after the Asian financial crisis, the theoretically expected influence of retained earnings and the firm's creditworthiness was enhanced. Moreover, the coefficient of the mini-boom dummy and tax ($BM*TAX$) had a significantly positive value (0.468), and the coefficient of mini-boom dummy and the retained earnings ratio ($BM*RE$) had a significantly negative value (-0.123). This suggests that the theoretically expected influence of tax and the retained earnings were more strengthened.

In the estimation of the long-term debt ratio, the coefficient of the cross term of post-crisis dummy and corporate tax ($AF*TAX$) was significantly positive (0.182), and the coefficient of the cross term of the post-crisis dummy and the firm's creditworthiness ($AF*SIZE$) was significantly positive (0.077). This implies that, after the Asian financial crisis, the influence of tax and fixed assets ratio on long-term debt ratios was consistent with the expectation of corporate financing theory. Furthermore, the coefficient of the mini-boom dummy and tax ($BM*TAX$) had a significantly positive value (0.153), which implies that the theoretically expected influence of tax was stronger.

Similar to the estimation of debt and long-term debt ratio, in the estimation of short-term debt ratio, the coefficient of the cross term of the post-crisis dummy and corporate tax ($AF*TAX$) was significantly positive (0.266), the coefficient of the cross term of the post-crisis dummy and the retained earnings ($AF*RE$) was significantly negative (-0.121), and the coefficient of the cross term of post-crisis dummy and the firm's creditworthiness ($AF*SIZE$) was significantly negative (0.074). This observation suggests that, after the post-crisis economic reforms, the influence of these economic factors on the short-term debt ratio was consistent with the expectation of corporate financing theory. Moreover, the coefficient of the mini-boom dummy and tax ($BM*TAX$) had a significantly positive value (0.285) and the coefficient of the mini-boom dummy and the firm's creditworthiness ($BM*SIZE$) had a significantly positive value (0.043). This suggests that, after the mini-boom since 2004, the theoretically expected influence of tax and the firm's creditworthiness was further enhanced.

The coefficients of dummy variables for the years from 1996 and 1997 were positive, and those for the years after 2001 were negative. Although most of these coefficients were not statistically significant enough¹², this shift suggests that listed companies tended to decrease their debts after the Asian crisis.

¹¹ After the Asian financial crisis, the total coefficient estimate of tax became positive ($-0.468+0.486>0$) and the total coefficient estimate of fixed assets ratio became positive ($-0.054+ 0.124>0$), too, as theoretically expected.

¹² The coefficient of the dummy variable for the year 1997 was significantly positive for all types of debt-ratio.

5.2. Estimation Results of Companies' Fixed Effects

The estimation results of companies' fixed effects by using dummy variables for the company's attribute as explanatory variables are summarized in Table 5-2. While the value of adjusted R^2 was not high, the selection of explanatory variables was not at fault in the sense that the values of F-tests are statistically significant enough.

(Table 5-2) Estimation Results of Companies' Fixed Effects

Before the Asian financial crisis, the ownership attributes affected all types of debt-rates. The coefficient estimates of the dummy variables representing the companies' ownership attributes, such as the ethnic Chinese dummy (*EthnicChinese*), government controlling dummy (*Government*), the foreign joint venture dummy (*Foreign*), the ethnic Indian dummy (*EthnicIndian*) had significant effects on the debt ratio, long-term debt ratio, and short-term debt ratio. This suggested that, in the pre-crisis period, the fund raising structures of listed companies were affected strongly by the social and political networks they possessed.

In the estimation of debt ratio, the coefficient estimate of the ethnic Chinese dummy, the foreign joint venture dummy, and the ethnic Indian dummy were positive (0.061, 0.107, 0.098, respectively) and statistically significant. In the estimation of long-term debt ratio, the ethnic Chinese dummy, the government controlling dummy, and the ethnic Indian dummy were positive (0.039, 0.054, 0.172, respectively) and statistically significant. In the estimation of short-term debt ratio, the coefficient estimate of the foreign joint venture dummy was positive (0.099) and statistically significant. These observations suggested that, compared to the Pribumi companies, the ethnic Chinese, the government controlling, the foreign joint venture, and the ethnic Indian companies had some social, political or economic networks that were used for tapping external debt funds at lower agency cost. These results supported the commonly cited stories that the ethnic Chinese and Indian companies had strong financial ties to their ethnic business communities, that the government controlling companies had implicit financial support, and that foreign joint ventures tapped their needed funds from abroad at low cost. On the other hand, the Pribumi companies without strong business or political networks had more difficulty in raising debt from external creditors at low agency cost.

After the economic reforms in the Asian post-financial crisis period, the effect of the corporate ownership attributes became very weak drastically in the estimation of debt ratio as well as long-term debt ratio. The coefficient estimates of cross terms of the post-crisis dummy variable and corporate ownership attributes had the opposite signs from those before the Asian crisis occurred. In the mini-boom period after 2003, the influence of corporate ownership attributes became weaker.

In the estimation of debt ratio, the coefficient estimates of the cross terms of the mini-boom dummy and the ethnic Chinese dummy ($AC*EthnicChinese$) was negative (-0.050) and statistically significant. In the estimation of long-term debt, the coefficient estimates of the cross terms of the economic reform dummy and the ethnic Chinese ($AC*EthnicChinese$), the government controlling dummy ($AC*Government$), and the foreign joint venture dummy ($AC*Foreign$) were all negative (-0.053, -0.111, -0.122, respectively) and statistically significant. Moreover, the coefficient estimates of the cross terms of the mini-boom dummy and the ethnic Chinese ($BM*EthnicChinese$), the

government controlling dummy ($BM*Government$), and the foreign joint venture dummy ($BM*Foreign$) were statistically significant and negative (-0.052, -0.111, -0.032, respectively).

Before the Asian financial crisis, the core companies in the business conglomerates tended to borrow funds more eagerly than other companies. In the estimation of debt ratio, long-term debt ratio, and short-term debt ratio, the coefficient estimate of the core companies (*Core*) was statistically significant and positive (0.038, 0.020, 0.017, respectively) in the pre-crisis period. This was consistent with the frequently cited understanding that the core companies functioned as the window through which business conglomerates tapped external funds and redistributed them among companies belonging to the conglomerates¹³.

After the post-crisis economic reforms, the business conglomerates normalized their fund raising structure by reducing the external debt, especially the short-term debt. In the estimation of the debt ratio and short-term debt ratio, the coefficient estimates of the core company dummy that were crossed with the after-crisis dummy ($AC*Core$) were statistically significant and negative (-0.054 and -0.048, respectively). This implied that the core companies more aggressively decreased their debt ratio than other companies, especially in reducing their short-term debt ratio.

However, the business conglomerates retained the special function of the core companies to raise long-term debt funds from external creditors. Meanwhile, in the estimation of the long-term debt ratio, the coefficient estimates of the cross term of the after-crisis dummy and the core company dummy in the long-term debt ratio was insignificant. Moreover, in the mini-boom after 2003, in the estimation of the long-term debt ratio, the coefficient estimates of the cross term of the mini boom dummy and the core company dummy ($BM*Core$) was significantly positive (0.036). These observations suggested that the core business of each business conglomerate is still responsible for borrowing long-term external funds after the Asian financial crisis, and that, as the demand for investment funds recovered in the mini boom, the business conglomerates expanded the special function of core companies to raise long-term debt funds from outside.

6. Concluding Remarks

The modernization and the rationalization of corporate activity are important policy tasks for sustainable economic development, which requires the modernization of institutional frameworks in developing economies. The wide-ranging economic reforms pursued by the Indonesian government after the Asian financial crisis gives us an interesting example for examining how the development of formal economic systems help change the economic behaviors of private companies. This study is the first attempt to investigate the influence of institutional changes on companies' corporate financing activities by clarifying the factors determining the capital structure of Indonesian listed companies before and after the implementation of reform policies subsequent to the Asian financial crisis. The estimation analysis of the panel data for the period 1994-1997

¹³ The coefficient estimate of the cross term of the post crisis reform dummy and the restructure companies dummy was a significantly negative value (-0.022) in the estimation of the debt ratio.

and 2000-2006 reveals several factors that determined substantive change in the financing activities of these listed companies.

Our investigation makes three contributions to this area of study. First, we found that the capital structure of Indonesian companies had not been explained sufficiently by the standard theory of corporate financing, which had not considered the effects of its specific social and political elements, as well as business conglomerates, before the Asian financial crisis. The estimation results prove that differences in corporate attributes had some influence on companies' fund raising activities. These observations suggested that the formal economic system that is assumed in the standard theory of corporate financing did not function well enough, and an informal code of common practices had a measurably large influence on the corporate capital structure in an Indonesian listed company before the Asian financial crisis.

Second, we found that the corporate financing behaviors of Indonesian listed companies changed after the economic reforms during the post-crisis period. Our estimation results show that the earlier significant differences in capital structure between companies possessing different socio-economic backgrounds, such as the ethnic Chinese companies, government controlling companies, and foreign joint venture companies, and the ethnic Indian companies, almost disappeared after the reforms. The post-crisis financing activities of listed companies in Indonesia are explainable by economic rationality. Any particular skew or constraint peculiar to Indonesia that was seen before the Asian financial crisis is no longer discernible in major explanatory variables, such as the profit yearnings ratio, collateral capacity, or corporate tax effects. These facts suggest that the fund raising activities of listed companies in Indonesia are becoming rational as a result of the post-crisis economic reforms that were designed to ensure the sound management of banks and the consolidation of corporate governance. The restructuring of capital structures and the reforms of Indonesian financial systems succeeded in building an institutional framework in which Indonesian companies could conduct fund raising activities based on economic rationality, not influenced by their social and political factors.

Our third contribution illustrates the limitation of reforms. The estimation results demonstrate that the agency cost incurred by information asymmetry was a critical determinant in corporate financing in Indonesia even after the Asian financial crisis and collateral providing capacity has the most significant impact on determinants of long-term debt ratio. Poor capacity to provide collateral and low transparency to outside creditors could become serious constraints on a company's borrowing even though its other corporate operational characteristics were equal to those of competitors. Only companies with a high collateral providing capability are able to borrow long-term external funds.

Another limitation of reform involves the companies' membership in a business conglomerate. For companies having a strong influence over the other members of their group, there is a tendency to have a higher long-term debt ratio and a lower short-term debt ratio than other companies. This tendency suggests that core companies within a business group can still function as a conduit of long-term external funds to other members of their group; they raise long-term funds by taking advantage of their relatively

low agency cost in tapping funds from outside creditors, and redistribute the those funds to other companies within the group¹⁴.

To solve these persistent problems, it is necessary to promote corporate information disclosure for the benefit of external investors and creditors. Furthermore, it is essential to build a legal framework for smooth liquidation of collateral and speedy reconstruction of failed companies. Despite the implementation of reform policies after the Asian financial crisis, there is still a desperate need for enhancing information disclosure and the legal infrastructure (Sato [2004]). In tandem with solution of these problems, the development of capital markets such as stock and debenture markets is required to meet the demand of large-scale long-term debts.

¹⁴ The mechanism of the existence of the internal capital market and the re-capital distribution in the financial clique could not be pursued in the present study where only the listed company was analyzed. It will be necessary to analyze the funding action of a financial clique system enterprise including non-listed companies to analyze this problem further.

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(Table 3-1) Comparison of Listed Companies by Ownership Attributes

	1994	1995	1996	1997	2000	2001	2002	2003	2004	2005
(%)										
Total debt ratio										
Pribumi	35.8	42.1	53.9	64.9	41.0	31.9	32.8	30.1	46.7	47.2
Ethnic Chinese	46.3	49.1	52.7	69.0	48.7	45.0	43.7	46.0	47.8	48.3
Government controlling	44.9	43.5	45.1	58.3	48.2	47.3	45.5	57.8	44.4	42.6
Foreign joint venture	45.6	53.4	53.0	65.8	46.6	44.8	43.3	45.1	45.6	46.3
Ethnic Indian	59.2	61.3	61.2	68.3	42.8	47.3	48.1	57.0	55.6	57.8
Short-term debt ratio										
Pribumi	22.8	27.2	30.6	46.2	30.1	26.6	27.7	16.8	31.0	27.9
Ethnic Chinese	33.0	34.8	33.3	45.1	29.6	29.5	28.1	29.8	29.0	30.4
Government controlling	20.7	25.0	22.7	25.1	34.7	35.6	33.0	31.0	22.3	21.2
Foreign joint venture	33.9	40.9	42.1	49.6	30.0	31.5	27.6	29.4	28.4	29.0
Ethnic Indian	35.6	30.9	31.4	27.8	28.9	31.9	32.3	34.3	30.9	26.8
Long-term debt ratio										
Pribumi	15.1	16.4	21.8	25.7	20.7	16.8	17.3	17.8	20.9	20.2
Ethnic Chinese	10.6	11.7	15.2	20.9	13.9	10.6	11.1	13.8	14.2	15.6
Government controlling	33.0	28.0	39.8	41.0	25.3	28.8	35.9	30.6	33.7	26.1
Foreign joint venture	—	1.4	0.9	1.3	22.1	27.0	28.6	32.6	36.6	34.0
Ethnic Indian	—	—	—	—	—	—	—	—	—	—
Short-term bank borrowing ratio										
Pribumi	11.7	13.1	14.5	21.9	14.9	8.5	5.8	1.5	3.0	2.9
Ethnic Chinese	16.3	16.9	16.4	22.8	9.9	13.1	11.6	11.2	7.7	12.8
Government controlling	7.4	7.3	6.1	12.7	7.8	13.8	12.2	6.7	2.1	7.1
Foreign joint venture	16.2	19.3	20.0	26.3	11.0	13.3	9.4	10.7	—	25.5
Ethnic Indian	21.7	12.8	11.4	3.7	—	—	—	—	—	—
Before-tax profit ratio										
Pribumi	7.8	7.2	6.5	7.4	6.5	5.20	2.5	8.9	6.8	6.8
Ethnic Chinese	9.6	7.6	5.7	8.6	5.6	6.0	5.6	6.4	6.1	6.1
Government controlling	8.4	8.9	5.3	14.8	12.6	6.6	9.6	14.0	14.5	14.5
Foreign joint venture	15.2	16.8	8.9	17.8	15.2	12.9	11.2	14.8	15.1	15.1
Ethnic Indian	8.5	7.5	5.8	7.2	3.3	-4.7	1.3	1.1	0.4	0.4
Surplus ratio										
Pribumi	8.5	18.7	11.5	14.1	14.1	11.9	20.1	18.2	17.7	17.7
Ethnic Chinese	11.2	16.8	13.9	17.3	17.5	19.5	21.2	20.6	21.9	21.9
Government controlling	16.4	17.5	12.7	22.2	21.4	22.1	16.9	25.9	27.1	27.1
Foreign joint venture	22.1	33.9	18.6	27.3	30.6	31.6	35.3	33.1	32.5	32.5
Ethnic Indian	15.2	17.2	12.1	13.1	10.9	7.8	13.0	13.9	13.2	13.2
Fixed asset ratio										
Pribumi	37.5	39.2	34.3	31.3	28	30.2	28.9	32.8	34.9	36.7
Ethnic Chinese	38.0	40.2	40.6	40.7	39.9	39.2	41.0	39.3	39.5	38.4
Government controlling	44.9	47.8	58.1	54.5	39.8	34.1	35.3	39.6	52.5	53.4
Foreign joint venture	31.8	45.1	41.8	41.4	31.1	31.4	34.5	34.7	38.3	36.2
Ethnic Indian	35.4	44.3	56.3	52.4	39.6	46.5	46.0	55.1	53.5	50.8

(Table 3-2) Comparison of Core and Non-core Companies

	1994	1995	1996	1997	2000	2001	2002	2003	2004	2005
Total debt ratio										
Core	46.7	50.5	54.2	69.6	50.3	46.6	44.8	46.6	49.2	49.6
Non-core	43.5	47.8	49.7	63.2	42.8	38.9	38.7	42.5	43.9	44.6
Short-term debt ratio										
Core	31.7	34.3	33.6	44.3	29.8	29.9	28.0	28.7	28.3	29.4
Non-core	32.5	36.8	36.1	45.8	30.4	30.0	28.4	28.7	29.8	29.0
Long-term debt ratio										
Core	15.1	16.4	21.8	25.7	20.7	16.8	17.3	17.8	20.9	20.2
Non-core	10.6	11.7	15.2	20.9	13.9	10.6	11.1	13.8	14.2	15.6
Short-term bank borrowing ratio										
Core	15.0	15.5	15.3	21.6	8.8	12.3	10.2	9.7	4.8	9.0
Non-core	17.1	18.5	19.3	25.1	13.4	13.1	11.0	11.1	11.6	17.4
Before tax profit ratio										
Core	38.3	40.9	42.4	42.0	40.8	38.7	41.6	41.1	41.8	40.7
Non-core	34	43.1	39.8	39.0	30.4	32.4	32.4	32.4	35.7	35.2
Surplus ratio										
Core	8.7	8.2	6.4	—	9.3	6.6	7.4	7.8	8.7	8.8
Non-core	14.5	12.7	6.5	—	13.1	10.3	8.1	5.6	9.6	8.6
Fixed asset ratio										
Core	11.3	18.3	12.5	8.6	17.8	19.2	21.5	23.9	22.4	24.4
Non-core	18.4	25.9	19.0	14.1	21.5	21.4	20.6	25.7	24.8	23.3

(Table 3-3) Comparison of Restructured and Non-restructured Companies

	1994	1995	1996	1997	2000	2001	2002	2003	2004	2005
Total debt ratio										
Restructured	42.9	51.2	51.6	69.8	42.4	34.5	36.9	44.0	49.0	50.4
Non-restructured	46.3	49.1	52.9	66.7	48.5	45.7	43.7	45.2	46.3	46.3
Short-term debt ratio										
Restructured	29.6	37.5	34.1	45.1	27.9	27.3	27.3	27.2	30.9	31.0
Non-restructured	32.6	34.5	34.5	44.7	30.7	30.7	28.5	29.1	28.2	28.5
Long-term debt ratio										
Restructured	13.3	14.8	18.0	24.9	15.2	8.9	10.9	16.8	18.1	19.4
Non-restructured	13.5	14.8	20.1	23.9	18.6	15.6	15.8	16.1	18.1	17.8
Short-term bank borrowing ratio										
Restructured	15.0	18.2	15.7	24.2	14.5	11.0	6.9	8.0	9.6	16.8
Non-restructured	15.8	15.9	16.7	22.1	9.8	13.0	11.3	10.7	6.0	10.3
Before tax profit ratio										
Restructured	13.3	14.8	18.0	24.9	15.2	8.9	10.9	16.8	18.1	19.4
Non-restructured	13.5	14.8	20.1	23.9	18.6	15.6	15.8	16.1	18.1	17.8
Surplus ratio										
Restructured	13.2	13.5	5.9	—	8.3	6.7	5.3	3.7	6.4	6.4
Non-restructured	10.0	8.7	6.6	—	11.7	8.9	8.5	7.6	10.0	9.7
Fixed asset ratio										
Restructured	13.3	14.8	18.0	24.9	15.2	8.9	10.9	16.8	18.1	19.4
Non-restructured	13.5	14.8	20.1	23.9	18.6	15.6	15.8	16.1	18.1	17.8

(Table 4-1) Basic statistics and correlation matrix

	Statistics		Correlation Matrix								
	Mean	Std	Debt ratios								
			<i>DA1</i>	<i>DA2</i>	<i>DA3</i>	<i>DA4</i>	<i>RISK</i>	<i>TAX</i>	<i>RE</i>	<i>FIX</i>	<i>SIZE</i>
<i>DA1</i>	0.549	0.219	1.000								
<i>DA2</i>	0.188	0.171	0.549	1.000							
<i>DA₃</i>	0.361	0.190	0.657	-0.269	1.000						
<i>DA4</i>	0.157	0.143	0.399	-0.210	0.649	1.000					
<i>RISK</i>	0.090	0.308	0.025	-0.059	0.083	0.096	1.000				
<i>TAX</i>	0.013	0.156	-0.073	-0.055	-0.034	-0.015	0.000	1.000			
<i>RE</i>	0.155	0.207	-0.218	-0.205	-0.066	-0.035	-0.050	0.012	1.000		
<i>FIX</i>	0.400	0.242	-0.009	0.217	-0.207	-0.091	-0.020	-0.042	0.335	1.000	
<i>SIZE</i>	5.591	0.556	0.266	0.466	-0.114	-0.175	-0.135	-0.007	-0.108	-0.019	1.000

(Table 5-1) Estimation Results of Debt Ratios

	Total debt-ratio(<i>TDR</i>)			Long-term debt ratio(<i>LDR</i>)			Short-term debt-ratio (<i>SDR</i>)			Short-term bank debt ratio(<i>SBDR</i>)		
	coefficient	t-value	P-value	coefficient	t-value	P-value	coefficient	t-value	P-value	coefficient	t-value	P-value
<i>RISK</i>	0.001	0.024	0.981	-0.098	-2.296	0.022 **	0.103	2.023	0.043 **	0.062	1.608	0.109
<i>TAX</i> _{<i>t-1</i>}	-0.468	-4.334	0.000 ***	-0.153	-1.773	0.077 *	-0.285	-2.779	0.006 ***	-0.087	-1.101	0.271
<i>RE</i> _{<i>t-1</i>}	-0.077	-2.207	0.028 **	-0.078	-1.976	0.049 **	0.022	0.466	0.641	0.028	0.923	0.356
<i>FIX</i> _{<i>t-1</i>}	-0.054	-1.487	0.137	0.020	0.585	0.559	-0.097	-2.446	0.015 **	-0.038	-1.245	0.214
<i>SIZE</i> _{<i>t-1</i>}	0.036	1.619	0.106	0.085	4.643	0.000 ***	-0.064	-2.930	0.003 ***	0.012	0.385	0.700
<i>AF</i> * <i>RISK</i>	0.115	0.920	0.358	-0.107	-1.082	0.280	0.214	1.809	0.071 *	0.247	2.108	0.036 **
<i>AF</i> * <i>TAX</i> _{<i>t-1</i>}	0.486	4.324	0.000 ***	0.182	2.027	0.043 **	0.266	2.493	0.013 **	0.087	1.047	0.296
<i>AF</i> * <i>RE</i> _{<i>t-1</i>}	-0.112	-2.112	0.035 **	-0.007	-0.145	0.885	-0.121	-2.058	0.040 **	-0.021	-0.377	0.706
<i>AF</i> * <i>FIX</i> _{<i>t-1</i>}	0.124	2.298	0.022 **	0.077	1.663	0.097 *	0.056	1.008	0.314	0.068	1.171	0.242
<i>AF</i> * <i>SIZE</i> _{<i>t-1</i>}	0.034	1.706	0.088 *	-0.026	-1.601	0.110	0.074	3.788	0.000 ***	0.004	0.149	0.881
<i>BM</i> * <i>RISK</i>	-0.003	-0.011	0.991	-0.170	-0.751	0.453	0.146	0.541	0.588	0.506	1.212	0.226
<i>BM</i> * <i>TAX</i> _{<i>t-1</i>}	0.468	4.333	0.000 ***	0.153	1.771	0.077 *	0.285	2.780	0.006 ***	0.115	0.663	0.508
<i>BM</i> * <i>RE</i> _{<i>t-1</i>}	-0.123	-2.017	0.044 **	-0.041	-0.746	0.456	-0.104	-1.605	0.109	-0.140	-1.024	0.306
<i>BM</i> * <i>FIX</i> _{<i>t-1</i>}	0.016	0.259	0.796	0.030	0.580	0.562	-0.012	-0.187	0.852	-0.041	-0.316	0.752
<i>BM</i> * <i>SIZE</i> _{<i>t-1</i>}	-0.018	-0.853	0.394	-0.045	-2.677	0.008 ***	0.043	2.127	0.034 **	0.023	0.379	0.705
<i>YD1996</i>	0.009	0.631	0.528	0.022	1.795	0.073 *	-0.005	-0.327	0.744	-0.011	-0.895	0.371
<i>YD1997</i>	0.164	10.538	0.000 ***	0.058	4.558	0.000 ***	0.112	7.442	0.000 ***	0.056	4.164	0.000 ***
<i>YD2001</i>	-0.224	-2.038	0.042 **	0.152	1.667	0.096 *	-0.454	-4.177	0.000 ***	-0.080	-0.611	0.541
<i>YD2002</i>	-0.246	-2.222	0.027 **	0.139	1.514	0.131	-0.464	-4.240	0.000 ***	-0.092	-0.698	0.485
<i>YD2003</i>	-0.223	-2.007	0.045 **	0.149	1.613	0.107	-0.452	-4.119	0.000 ***	-0.088	-0.669	0.504
<i>YD2004</i>	0.126	1.124	0.262	0.298	3.247	0.001 ***	-0.254	-2.324	0.020 **	-0.124	-0.331	0.741
<i>YD2005</i>	0.135	1.208	0.227	0.303	3.312	0.001 ***	-0.251	-2.296	0.022 **	-0.072	-0.192	0.848
The number of		1137			1100			1100			684	
The number of individuals		235			233			233			208	
Adjusted R-square		0.662732			0.623827			0.561545			0.145489	
F-statistics (A,B=Ai,B)		5.8182 ***			4.3464 ***			4.8027 ***			4.8009 ***	
Hausman's test		Fixed			Fixed			Fixed			Fixed	

note) *, **, and *** significant at 10, 5, and 1percent level, respectively.

(Table 5-2) Estimation Results of Company's Fixed Effects

	Total debt-ratio (<i>TDR</i>)			Long-term debt ratio (<i>LDR</i>)			Short-term debt-ratio (<i>SDR</i>)			Short-term bank debt ratio (<i>SBDR</i>)		
	coefficient	t-value	P-value	coefficient	t-value	P-value	coefficient	t-value	P-value	coefficient	t-value	P-value
<i>C</i>	0.217	9.418	0.000 ***	-0.319	-18.796	0.000 ***	0.632	32.953	0.000 ***	0.112	4.920	0.000 ***
<i>Ethnic Chinese</i>	0.061	2.915	0.004 ***	0.039	2.490	0.013 **	0.018	1.014	0.311	0.024	1.282	0.200
<i>Government</i>	0.046	1.311	0.190	0.054	2.131	0.033 **	-0.011	-0.368	0.713	-0.070	-2.199	0.028 **
<i>Foreign</i>	0.107	4.794	0.000 ***	0.017	1.004	0.315	0.099	5.215	0.000 ***	0.042	2.014	0.044 **
<i>Ethnic Indian</i>	0.100	1.881	0.060 *	0.172	4.476	0.000 ***	-0.070	-1.620	0.105	-0.116	-2.819	0.005 ***
<i>Core</i>	0.038	4.732	0.000 ***	0.020	3.408	0.001 ***	0.017	2.582	0.010 ***	-0.017	-2.564	0.011 **
<i>AF*Ethnic Chinese</i>	-0.028	-1.268	0.205	-0.041	-2.517	0.012 **	0.015	0.813	0.417	0.002	0.115	0.908
<i>AF*Government</i>	-0.005	-0.107	0.915	-0.099	-2.854	0.004 ***	0.094	2.382	0.017 **	0.052	1.115	0.265
<i>AF*Foreign</i>	-0.022	-1.048	0.295	-0.019	-1.202	0.230	-0.009	-0.500	0.617	-0.035	-1.591	0.112
<i>AF*Ethnic Indian</i>	-0.075	-0.876	0.381	-0.122	-1.972	0.049 **	0.048	0.685	0.493	0.000	0.000	1.000
<i>AF*Core</i>	-0.054	-2.709	0.007 ***	-0.012	-0.805	0.421	-0.048	-2.937	0.003 ***	-0.054	-2.418	0.016 **
<i>AF*Restructured</i>	-0.022	-1.838	0.066 *	-0.013	-1.525	0.128	-0.009	-0.910	0.363	-0.003	-0.271	0.786
<i>BM*Ethnic Chinese</i>	-0.050	-1.907	0.057 *	-0.053	-2.735	0.006 ***	0.004	0.175	0.861	0.013	0.298	0.766
<i>BM*Government</i>	-0.065	-1.168	0.243	-0.111	-2.789	0.005 ***	0.050	1.104	0.270	-0.036	-0.431	0.667
<i>BM*Foreign</i>	-0.033	-1.274	0.203	-0.032	-1.689	0.092 *	-0.012	-0.541	0.589	-0.186	-1.342	0.180
<i>BM*Ethnic Indian</i>	-0.030	-0.248	0.804	-0.113	-1.317	0.188	0.088	0.905	0.366	0.000	0.000	1.000
<i>BM*Core</i>	0.026	1.013	0.311	0.036	1.966	0.050 **	-0.008	-0.406	0.685	0.092	1.120	0.263
<i>BM*Restructured</i>	-0.006	-0.432	0.666	0.000	0.048	0.962	-0.007	-0.640	0.522	-0.042	-1.918	0.056 *
<i>Industry</i>												
<i>Construction</i>	-0.056	-1.156	0.248	-0.067	-1.740	0.082 *	0.041	0.945	0.345	-0.132	-2.232	0.026 **
<i>Communicati</i>	-0.026	-0.606	0.544	0.004	0.143	0.886	-0.028	-0.804	0.421	0.000	0.000	1.000
<i>Hotel/Travel</i>	0.010	0.316	0.752	0.052	2.163	0.031 **	-0.034	-1.238	0.216	-0.034	-1.026	0.305
<i>Manufacturin</i>	0.017	0.943	0.346	-0.028	-2.194	0.028 **	0.041	2.836	0.005 ***	-0.001	-0.067	0.946
<i>Mining</i>	-0.054	-1.777	0.076 *	-0.000	-0.010	0.992	-0.054	-2.206	0.028 **	-0.052	-1.316	0.189
<i>Transportatio</i>	-0.002	-0.087	0.931	0.061	2.965	0.003 ***	-0.041	-1.765	0.078 *	-0.074	-2.606	0.009 ***
<i>Retail</i>	0.050	1.939	0.053 *	-0.114	-6.134	0.000 ***	0.160	7.606	0.000 ***	0.009	0.344	0.731
<i>Real Estate</i>	0.007	0.337	0.737	-0.035	-2.115	0.035 **	0.051	2.752	0.006 ***	0.004	0.192	0.847
The number of observations	1137			1100			1100			684		
Adjusted R square	0.079466			0.150402			0.134875			0.091759		
F-statistics	4.92263 ***			8.78213 ***			7.85346 ***			3.76012 ***		

note) *, **, and *** significant at 10, 5, and 1percent level, respectively.

Appendix

(Table A-1) Estimation Results of Short-term Bank Borrowing Ratio and Company's Fixed Effects

	Short-term bank debt ratio(<i>SBDR</i>)				Short-term bank debt ratio(<i>SBDR</i>)		
	coefficient	t-value	P-value		coefficient	t-value	P-value
<i>RISK</i>	0.063	1.636	0.103	<i>C</i>	0.134	5.896	0.000 ***
<i>TAX</i> _{<i>t-1</i>}	-0.090	-1.143	0.254	<i>Ethnic Chinese</i>	0.023	1.200	0.230
<i>RE</i> _{<i>t-1</i>}	0.025	0.831	0.406	<i>Government</i>	-0.070	-2.213	0.027 **
<i>FIX</i> _{<i>t-1</i>}	-0.037	-1.207	0.228	<i>Foreign</i>	0.040	1.950	0.052 *
<i>SIZE</i> _{<i>t-1</i>}	0.008	0.259	0.796	<i>Ethnic Indian</i>	-0.116	-2.825	0.005 ***
<i>AF</i> * <i>RISK</i>	0.250	2.130	0.034 **	<i>Core</i>	-0.017	-2.495	0.013 **
<i>AF</i> * <i>TAX</i> _{<i>t-1</i>}	0.089	1.064	0.288	<i>AF</i> * <i>Ethnic Chinese</i>	0.004	0.174	0.862
<i>AF</i> * <i>RE</i> _{<i>t-1</i>}	-0.028	-0.501	0.617	<i>AF</i> * <i>Government</i>	0.052	1.136	0.256
<i>AF</i> * <i>FIX</i> _{<i>t-1</i>}	0.076	1.303	0.193	<i>AF</i> * <i>Foreign</i>	-0.032	-1.472	0.141
<i>AF</i> * <i>SIZE</i> _{<i>t-1</i>}	0.007	0.294	0.769	<i>AF</i> * <i>Ethnic Indian</i>	0.000	0.000	1.000
<i>BM</i> * <i>RISK</i>	0.733	19.013	0.000 ***	<i>AF</i> * <i>Core</i>	-0.056	-2.508	0.012 **
<i>BM</i> * <i>TAX</i> _{<i>t-1</i>}	0.099	1.259	0.209	<i>AF</i> * <i>Restructured</i>	-0.004	-0.322	0.748
<i>BM</i> * <i>RE</i> _{<i>t-1</i>}	-0.150	-1.055	0.292	<i>BM</i> * <i>Ethnic Chinese</i>	0.013	0.295	0.768
<i>BM</i> * <i>FIX</i> _{<i>t-1</i>}	-0.048	-0.374	0.708	<i>BM</i> * <i>Government</i>	-0.036	-0.427	0.669
<i>BM</i> * <i>SIZE</i> _{<i>t-1</i>}	0.028	0.448	0.654	<i>BM</i> * <i>Foreign</i>	-0.179	-1.296	0.196
<i>YD1996</i>	-0.010	-0.849	0.396	<i>BM</i> * <i>Ethnic Indian</i>	0.000	0.000	1.000
<i>YD1997</i>	0.056	4.126	0.000 ***	<i>BM</i> * <i>Core</i>	0.087	1.062	0.289
<i>YD2001</i>	-0.100	-0.766	0.444	<i>BM</i> * <i>Restructured</i>	-0.041	-1.908	0.057 *
<i>YD2002</i>	-0.115	-0.870	0.385	<i>Industry</i>			
<i>YD2003</i>	-0.109	-0.821	0.412	<i>Construction</i>	-0.132	-2.240	0.025 **
<i>YD2004</i>	-0.147	-0.387	0.699	<i>Communicatio</i>	0.000	0.000	1.000
<i>YD2005</i>	-0.096	-0.251	0.802	<i>Hotel/Travel</i>	-0.035	-1.075	0.283
				<i>Manufacturing</i>	-0.001	-0.068	0.946
				<i>Mining</i>	-0.054	-1.363	0.173
				<i>Transportation</i>	-0.076	-2.660	0.008 ***
				<i>Retail</i>	0.010	0.380	0.704
				<i>Real Estate</i>	0.006	0.262	0.794
The number of observations	683			The number of observations	683		
Adjusted R-square	0.999946			Adjusted R square	0.09172		
F-statistics (A,B=Ai,B)	4.7538 ***			F-statistics	3.75478 ***		
Hausman's test	Fixed						

note) *, **, and *** significant at 10, 5, and 1percent level, respectively.