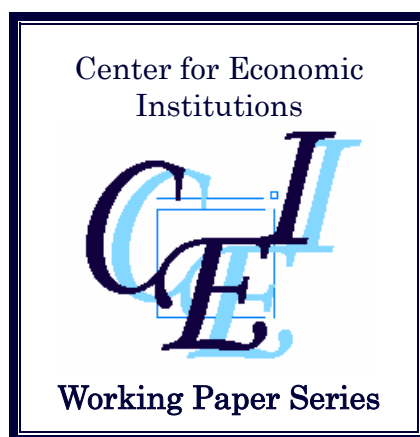


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***Fund Mobilisation and Investment Behavior
in Thai Manufacturing Firms in the Early
1990s***

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Abstract

This paper investigates the capital structure and investment behaviour in Thailand in the early half of the 1990s. First, we examine the idea of ‘pecking order’ preferences for firms’ fund raising in developing countries generally and in Thailand in particular. We consider unique features such as the low degree of firm participation in the organized securities market and the high dependence on informal financial transactions, or quasi self-financing.

Next, we estimate the determinants of the capital structure and the investment function. We found a lot of interesting results. First, the debt ratio of listed firms is lower than that of non-listed firms, which is realised by the increase in the capital surplus gained by initial public offerings. Second, however, participation by firms in the organized securities market accommodates agency costs, not only in equity markets, but also in the market for bank loans as a ‘by-product’ effect, which reduces informal financial transactions. Third, manufacturing firms belonging to the ‘financial conglomerate’ are surprisingly inactive investors and dependent on informal financial transactions, whereas foreign firms borrow less and invest more. In addition, of the various fund mobilization methods, only bank loans, particularly long-term loans, promptly affect equipment investment by firms.

Keywords: capital structure, investment, financial system, Thailand

JEL classification: E22, G32, O16

1. Introduction

The purpose of this paper is to investigate features of the capital structure and their effects on investment behaviour in Thai manufacturing companies, including non-listed companies, in the first half of the 1990s.

After the financial crisis of 1997, the fund-raising behaviour of Thai firms, particularly their excess dependence on debt financing, was criticized by academic and policy research. Most cite the vulnerability of high debt financing as a major cause of the financial crisis, and discuss ways of diversifying firms' fund-raising behaviour by using the capital market, by using equity financing or issuing bonds (Claessens et al., 1998; World Bank, 1998). Recently, discussion has also focused on the possibility of expanding the Asian bond market.

However, existing empirical studies have not elucidated completely Thai companies' capital structures and their effects on investment behaviour both before and after the crisis. Observing the corporate financial structure in the early 1990s, Amano and Mieno (1997) identify several characteristics, including the 'estranged' relationship between banks and manufacturing firms in financial groups, the relatively low debt ratio of listed companies, and large companies' high dependence on short-term loans. Wiwattanakantang (1999) examines the determinants of the capital structures of companies listed on the Stock Exchange of Thailand (SET) in 1994, focusing on company ownership and business group affiliation. She found that the concentration of shares is negatively correlated with the debt ratio, and that firms owned by single families have relatively high debt ratios.¹

Several cross-country comparative studies refer to Thai corporate financial structure. Singh and Hamid (1992) point out that the debt ratios of developing countries (including Thailand) were generally high in the 1980s. Conversely, Claessens et al. (1998), as quoted above, insist that excessive dependence on indirect finance among Asian countries in the 1990s was a major cause of financial crisis. Booth et al. (2001) concluded their comparative study of ten developing countries by expressing the view that simple application of the general theory of the determination of the capital structure is not rational for developing countries.

Although previous studies have brought some issues to light, unresolved issues remain. The first relates to sample selection problems. Most existing studies, including Wiattanakantang (1999) and Claessens et al. (1998), cover only some of the companies listed on SET. However, in Thailand (as in most developing countries), only a limited number of major firms participate in organized securities markets. Moreover, their listing behaviour might depend on aspects of ownership, such as business group affiliation or nationality. It has been suggested that firms' listing behaviour is itself a kind of fund mobilization. This is because firms raise cash as stock premiums by listing, and therefore the decision to list is a matter of choice for the existing shareholders. Accordingly, restricting analysis to listed firms may induce sample-selection bias. Second, most studies focus only on the debt ratio (leverage). However, in developing countries, the share of formal debt composition in total debt is low, and informal financial transactions, such as deferred payment and credit from managers or group companies, represent a large share of total debt. Because informal financial transactions are significant in developing economies and because their agency cost structures may differ from bank loans or bond issues, it is important to focus on these transactions.

This paper aims to overcome the limitations of existing studies. First, in relation to the data set, we focus on both listed and non-listed firms in those manufacturing sectors that have driven Thai industrialization. Second, in relation to capital structure, we focus not only on the debt ratio, but also on bank borrowing and informal borrowing compositions. We also analyse total bank loans and their decomposition into short- and long-term loans. Third, we estimate a neo-classical-type investment function,² in order to examine the effect on equipment investment of fund-mobilizing methods, including bank loans, informal credit and long-term loans.

In section 2, we outline firms' fund raising and investment behaviour in Thailand, which is an example of a developing economy. In addition, we examine its determinants. In section 3, we present aggregated data and descriptive measures. In sections 4 and 5, we empirically examine the capital structure and investment behaviour, respectively, using firm-level micro data. Section 6 concludes the paper.

2. Determinants of Bank Loans and Investment

2.1. Agency Costs, Fund Raising and Investment

Myers (1984) and Myers and Majluf (1984) point out the difference between capital costs in internal finance and debt finance, which arises due to agency costs. They also present a notion of firms' preferences in fund-raising methods, known as the 'pecking order hypothesis', in the context of which the model is simplified so that there are only two types of method: equity and debt. From this viewpoint, a series of empirical studies on developed countries, following the pioneering work of Fazzari et al. (1988), reveals that the capital costs for investment depend on the fund-raising method. Capital costs are lower, the lower the agency cost associated with the fund-raising method.

Taking account of the structure of actual financial markets, we consider the following modified determining mechanisms of the capital structure and the average capital cost. (1) Firms face restrictions on particular methods, such as limitations on access to the capital market (particularly for non-listed companies). (2) The combination share of each method is determined in equilibrium where all transaction costs, or agency costs, are equal. Investment is thought to be determined by the minimum average capital cost given the expected earnings of the investment.

However, when the pecking order hypothesis is applied to countries such as Thailand, where financial markets are not sufficiently developed, other factors should be taken into account. In developing countries, several underdeveloped methods of fund mobilization are in the process of being developed, and some methods are available only to particular firms. First, the market for bank loans works effectively only if banks provide information efficiently to lower agency costs sufficiently to make transactions feasible. Second, corporate debt and equity markets work for firms only if there is an organized capital market and firms participate in it. In particular, we focus on the following two issues as crucial problems in developing economies.

(1) Underdevelopment of Capital Markets

Capital markets do not function effectively as sources of fund raising in most developing countries. While there are organized capital markets in which investors place funds in most developing countries, the role of the capital market in mobilizing funds for firms is limited in many countries. For company owners, participation in the capital market is the only alternative, given its merits as a source of finance and its disadvantages, which are due mainly to releasing control rights originally assigned to the owners or their families. Hence, for firms, the choice of equity finance as a fund-

raising method is made in two stages: participation in the market – initial public offering (IPO); and issuing new bonds or equity.

(2) Two Types of Informal Credit Channel

In developing countries, loan–debt ratios are not necessarily high, and a large part of debt composition consists of informal factors. This is interpreted as the result of a lack of availability of funds caused by the high agency costs associated with bank loans in incomplete financial markets. Informal finance comes in two forms. The first is credit from informal markets, which is approximately equal to accounts payable and deferred payments in the balance sheet. The second is credit from non-market channels with related parties such as owners, managers, affiliated firms and subsidiaries. This type of informal finance is similar to self-finance rather than debt in the sense that the agency cost is close to zero. We refer to this as ‘quasi self-finance’.

In this paper, we focus on six significant fund-raising methods: (i) self-finance; (ii) quasi self-finance; (iii) bank borrowing; (iv) informal debt; (v) equity finance; (vi) stock premiums gained by IPO. We also analyse the function of long-term credit by decomposing (iii), bank borrowing, into short-term and long-term borrowing. The pecking order or level of agency cost, in the sense of Myers (1984), is expected to be such that (i) < (iii) (iv) < (v). The agency costs of (ii) and (vi) are thought to be close to that of (i) or zero. The difference between the agency costs of (iii) and (iv) is unclear. Short-term borrowing and long-term borrowing are thought to be equivalent to (iii) in relation to agency costs.

2.2. Corporate Ownership and the Capital Market in Thailand

In addition to the general problem related to agency cost issues, there are unique and significant features of Thai firms associated with informal finance and the capital market. This subsection describes these features in order to construct an analytical framework for empirical work.

(1) Business Groups in Thailand

The first factor that may influence the capital structure in Thai firms is the relationship between firms and business groups. The comprehensive study on Thai business groups by Suehiro (1989) describes their characteristics. Most Thai business groups originated from export merchants dealing in primary products such as sugar, rice and wooden goods. The groups have been operating since the late 1940s. Thai business groups usually comprise a core (or parent) company and many affiliated companies owned by owner-families, family-owned holding companies and cross-holdings.

Suehiro (1987, ch.7) classified Thai business groups into three categories based on their origins and major businesses: the first, the 'Financial Conglomerates', centres on the commercial banks; the second, the 'Industry Group', includes those that have been expanding mainly in the textile and apparel, and footwear industries since the 1960s; and the third, the 'Agribusiness Group', is based on exporters of agro-products. Suehiro found that Financial Conglomerates generally limit their business activities to the finance and commerce sector, and are wary of engaging in manufacturing. The Industry Group and the Agribusiness Group are generally excluded from commercial banking and credit channels. Hence, they tend to establish joint ventures with foreign capital to expand their businesses.

In Thailand, commercial banks emerged following World War II, and were formed as part of, and have grown simultaneously with, Financial Conglomerates. Established by the traders and processors of primary products such as rice and timber, they grew rapidly in the 1950s. In the early days, they provided trade credit, and before the mid 1980s the share of loans for the manufacturing sector was negligible. Before the financial crisis in 1997, ownership was concentrated among particular families, although ownership structures gradually diversified following the amendment of commercial banking laws in 1978. Commercial banks were also the core entities of the Financial Conglomerates, which developed their businesses primarily in the non-manufacturing sectors.

In the context of the history of the banking sector in Thailand, we should consider two possibilities for commercial banks. First, bank loans might not play a significant role in firms' fund mobilization because banks are merely financial entities for each Financial Conglomerate, and have limited capability for financial intermediation. This means that informal finance or alternative methods might be widely used. Second, the availability of bank loans for individual firms might depend on the features of the business groups to which the firms belong. For instance, firms belonging to the Financial Conglomerates might have greater access to bank loans than others.

(2) Foreign Companies

Foreign companies have played a significant role in Thailand's economic development. In the context of establishing new local companies, the most popular form is a joint venture in which both foreign multinational companies and local partners invest. The Alien Business Law typically limits the foreign company's share to fifty per cent. We consider the following possibilities in relation to the fund-raising behaviour of foreign

firms. First, these firms may be able to retain links with their parent companies in the form of intra-firm credit and capital increases. Second, foreign firms are more accessible to the local branches of foreign banks from the same country, because informational asymmetries are reduced by links to parent companies and foreign banks in their home countries.

(3) Firms' Participation in Securities Markets

Although the Securities Exchange of Thailand (the Stock Exchange of Thailand from 1991) was established in 1975, its functions were initially limited. The situation had changed little by 1980, despite the government's attempt to diversify the ownership of business groups by implementing the Public Company Act in 1979. In 1992, comprehensive reforms to the capital market, including amendment of the Public Company Act and the Securities and Exchange Act, were implemented to relax rules on listing, which led the market activated to some degree. The number of listed companies peaked at 454 in 1996, just before the financial crisis. However, even in the early 1990s, the number of listed companies was less than half that of major companies. In Thailand, not all major companies use the securities market for fund mobilization, and participation in the market is a matter of choice for individual companies.

Incompleteness of the securities market may produce several features of firms' capital structures. First, their affiliation to business groups may influence their participation in the securities market. By listing on the market, individual firms can diversify their methods of fund mobilization by using equities and bonds. However, they have to release their control rights because of the rules and the regulations of the listing code. Hence, whether companies list is determined by factors such as the availability of alternative fund-raising methods and firms' attitudes to giving up control

rights. Group-affiliated companies may hesitate to participate in the securities market to retain control rights. Financial Conglomerate companies may be more reluctant to participate because they may have internal fund channels with commercial banks.

Second, listing may have indirect effects on firms' capital structures in the developing financial markets, where bank loans are unevenly distributed. Listing realizes the disclosure and diffusion of company information, which reduces the agency problem in financial markets overall. Therefore, it may also stimulate bank lending in the indirect financial market.

3. Descriptive Observations

3.1. Data

The sample data used for analysis are firm-level financial data on 320 major manufacturing companies, including listed and non-listed companies, from 1991 to 1995. We have 748 observations as unbalanced panel data. The information on firm profiles is based on 'Financial Day 2000' published in 1996 by Manager Information Services Co. Ltd, which covers 992 manufacturing firms. The financial data on each firm are from the database provided by Manager Information Services Co. Ltd, which covers 2164 manufacturing firms. Matching the two sets of information yields data on 685 firms for analysis. We focus the analysis on the 320 large-sized firms (111 listed firms and 209 non-listed firms),³ mainly because of a lack of information on the business-group affiliations of small firms.

The procedure used to identify affiliation to business group and foreign ownership is as follows. Suehiro (1989, 2001) classified the 65 major Thai business groups and their associated firm affiliations primarily on the basis of group or firm histories and

ownership. He also classified business groups into three types: Financial Conglomerates, Industry Groups and Agribusiness. Based on this classification, we checked the affiliations of the 320 firms to 27 major business groups. We also classified the business groups into two categories: Financial Conglomerates and Manufacturing Groups: Manufacturing Groups incorporates Industry Groups and Agribusiness from Suehiro's (1989) classification.

We defined foreign firms as those in which more than 40% of the shares are owned by foreign firms, based on Suehiro (2000) and various company directories.⁴

3.2. Distribution of the Samples

Tables 1 and 2 present the characteristics of the distribution of the samples.

According to Table 1, the largest numbers of firms are in the Manufacturing Groups and Foreign Firms, followed by Financial Conglomerates. The table seems to support the suggestion of Suehiro (1989) that private capital formation to the mid-1980s resulted in a segregation between Financial Conglomerates, which developed primarily in service sectors, and firms in the Industry Group, which developed only in manufacturing sectors.

For 1994, the total number of firms in the sample is 312, which includes 110 listed firms. This means that the samples cover most of the listed firms, because the total number of listed firms in 1994 was 389 and the number of firms in manufacturing sectors is thought to be 150–170. However, the number of listed firms as a proportion of representative large-sized firms is no more than 35.2%. Table 2 indicates that the share of listed firms is relatively high in the textiles, pulp and non-steel metal industries, and relatively low in chemical products, metal and machinery. According to the

classifications for business group and ownership nationality, there appears to be more listed firms among non-group firms, and fewer among Financial Conglomerates and Foreign Firms.

3.3. Capital Structure

Table 3 summarizes the balance sheets of the firms in 1994 by business group and ownership type. Comparing listed and non-listed firms, the debt ratio of the former, at 55.3%, is much lower than that of the latter, which is 70.9%. However, there is little difference in the bank-borrowing ratios (denominated by total assets). This implies that the difference in the debt ratios is due to the difference in Other Liabilities, such as debt from affiliated companies and deferred payments. Equities are higher for listed firms, evidently because of different Capital Reserves, rather than differences in Paid in Capital or Retained Income.

We note several characteristics of the business groups and ownership nationality. Among non-listed firms included in Financial Conglomerates, the bank-borrowing ratio is unexpectedly below average, and higher in Other Liabilities, resulting in a higher debt ratio. By contrast, among listed firms included in Financial Conglomerates, the ratio of Other Liabilities is lower, and that in bank borrowing is higher. For foreign firms, the debt ratio is about average for listed and non-listed firms, but the bank-borrowing ratio is lower. This suggests that foreign-owned firms depend on credit channels with parent multinational companies in the form of capital increases and intra-firm credit.

Table 4 reports capital structures by year, calculated only from five-year full-panel sample. For listed companies, structures hardly changed, except for a slight decrease in Retained Earnings from 1991 to 1995. For non-listed firms, there was a sharp decline in

the debt ratio after 1994, which was reflected by the increase in Retained Earnings. This implies that non-listed manufacturing firms had decreased their debt ratios by increasing their dependence on Retained Earnings under the situation that the economy was expanding. It is worth noting that, for non-listed firms, the bank-borrowing ratio exhibits a stable declining trend, particularly for long-term borrowing. Perhaps because of economic expansion and a rapid inflow of foreign capital through the banking sector, non-listed companies reduced their dependence on debt and bank lending. Furthermore, the term composition of bank loans changed to a more short-term basis.

3.4. Equipment Investment

Tables 5 and 6 report fixed-asset ratios and equipment investment ratios (denominated by total assets) by type of business group and by year, respectively. Generally, the fixed assets of non-listed firms are greater than those of listed firms. By business-group classification, the ratio is higher for Non-Group Firms and foreign firms, and lower for Financial Conglomerates. The time-series trend is not clear, except for the sharp increase in 1994, when the Bangkok Offshore Market began to operate.

There is no clear difference between the equipment investment ratios of listed and non-listed firms. The trend in this ratio is very similar to that in the fixed-assets ratio. The ratio tends to increase, particularly after 1994.

3.5. Effects of IPO Behaviour

Table 7 reports the trend of changes in Capital Structure and equipment investment between the pre- and post- IPO years. The data cover only the 77 firms that floated on the SET between 1992 and 1995. We note several interesting facts. First, in the year of IPO, debt ratios and bank-borrowing ratios declined sharply, and in response, Capital

Surplus increased. Second, one year prior to IPO, debt ratios and bank-borrowing ratios were lower than average and Retained Incomes were above average. This suggests that firms' efforts to satisfy the IPO requirements set by the SET or SEC (Securities and Exchange Committee) reduced firms' dependence on debt finance. Third, bank-borrowing ratios recovered slightly in the post-IPO period.

Finally, and importantly, at the year of IPO, long-term borrowing sharply declined, and in the post-IPO period, it continued on its downward trend. On the other hand, short-term borrowing increased following IPO. This suggests that increased cash flow on the equity side at flotation substituted primarily for long-term borrowing on the debt side.

There is a clear trend in equipment investment. Investment was evidently restricted in the pre-IPO period and increased when the firm floated. The investment rates in periods 1 and 2 are consistent with those in Tables 6 and 7, which show that listed firms had lower investment rates (at around 6%) than non listed firms.

4. Estimation of the Capital Structure

4.1. Model and Variables

Now, we proceed to empirical analysis of the determinants of capital structure. We focus on five types of debt, which are our dependent variables, and introduce cash-flow factors and firm attributes as independent variables in addition to basic control factors.

(1) Dependent Variables

The dependent variables used for estimation are as follows:

1. Debt Ratio = Debt / Total Assets;⁵
2. Bank-Borrowing Ratio = Bank Borrowing / Total Assets;

3. Other Debt = (Debt – Bank Borrowing) / Total Assets;⁶

4. Short-Term Borrowing Ratio = Short-Term Borrowing / Total Assets;

5. Long-Term Borrowing Ratio = Long-Term Borrowing / Total Assets;

In this context, Bank Borrowing = Short-Term Borrowing Ratio + Long-Term Borrowing Ratio.

Other Debt consists mainly of deferred payments, notes payable and other liabilities, which could be interpreted as informal financial transactions.

(2) Control Variables

For control variables, we introduce variables that have been shown to affect agency costs in previous studies. First, the non-debt-tax shield is known to be a primary influence on tax saving through debt. Debt incurs tax saving because interest expenses are treated as deductions from taxable income. However, the magnitude of the effect depends on the scope for accounting for it, or on the residual of the total tax shield minus the non-debt tax shield. Therefore, the tax-saving effect through debt is influenced by the non-debt tax shield. Many previous studies have identified the influence of the tax-saving shield on firms' debt finance and use the depreciation rate to proxy the non-debt tax shield. However, this proxy is not available in our data set. We directly calculate the non-debt-tax shield by following the method presented in Titman and Wessels (1988). Corporation tax T is $T = \tau (OI - I - NDT)$, where τ is the tax rate, OI is operating income, I is interest expenses and NDT is the non-debt tax shield. Hence, the non-debt tax shield is:

$$NDT = OI - I - T / \tau$$

Second, previous studies have obtained positive correlations between cash flow and debt ratio. According to the pecking order hypothesis, a firm prefers cash flow to debt, because the agency cost is lower than that of debt. Some studies adopt Retained Earnings in the balance sheet as a proxy for cash flow. Because Retained Earnings is a stock variable, it differs from cash flow, which is available to firms at any time. Many studies deal with this problem by using the profit rate as the proxy. In our study, we use both proxies.⁷

The other problem, as mentioned in section 2, is whether it is appropriate to treat Cash Flow as being only on the equity side for developing economies. Taking ownership and governance structure into account, some liability items, such as Borrowing from Managers and Employees and Borrowing from Affiliated Companies, could be considered as being similar to self-finance. In our empirical study, we regard these as types of self-finance and treat Quasi Self-Finance as being defined in terms of the following explanatory variables:

$$\text{Quasi Self-Finance} = (\text{Borrowing from Managers and Employees} + \text{Borrowing from Affiliated Companies}) / \text{Total Assets}.$$

Third, we introduce the coefficient of variation for profit as a risk factor, and total assets as a proxy for firm size. Although the theoretical justification is not necessarily clear, these variables are significant in many studies. Arguably, the higher the risk and the smaller the size, the lower is the debt ratio.

We control for differences in technology between industries. Generally, in industries in which the technology is highly specific, so that informational asymmetries are serious, the agency cost associated with debt finance is thought to be relatively high. R&D

expenses and advertising expenditure are known as appropriate proxies for such technology specificity. For our analysis, given data availability, we use industry dummies (at the ISIS two-digit level) instead.

(3) Determinants

We focus on the following features of Thai corporate financial structure. The first is the relationship between a firm's IPO behaviour and its capital structure. It has been suggested that a major incentive for firms to participate in organized securities markets is to diversify their financial resources towards equity finance. This means that listing has a negative effect on the debt ratio. On the other hand, firms' listing behaviour may induce disclosure, and this may reduce the agency cost of financial transactions as a whole. This may promote debt finance. Furthermore, if the agency costs of bank borrowing and other forms of informal borrowing differ, their "pecking order" preference may change in the way that debt composition changes. We test this hypothesis by introducing the Listed Dummy variable.

The second point is the effect of firms' attributes in relation to business-group affiliation and foreign ownership. For example, given the close and long-standing relationship between manufacturing firms in the Financial Conglomerates group and commercial banks, these firms have easy access to bank loans. Conversely, foreign firms could have easy access to equity finance and intra-firm credit through their inner fund channels with parent multinational corporations. Hence, we include the dummy variables for Financial Conglomerates and Foreign Firms in the estimation.

4.2. Estimation Results

The estimation results are summarized in Table 8. With regard to the debt ratio, the coefficient of total assets is positive while the risk factor is negative and significant, which is consistent with results from previous studies. The coefficient of total assets is positive and significant with respect to the debt ratio and bank borrowing, but is either insignificant or negative with respect to Other Liabilities. This implies that large firms depend less on informal borrowing because they can borrow from banks since their capacity to repay is greater.

(1) Cash Flow and Quasi Self-Finance

Retained Income as a proxy for cash flow is not significant with respect to the debt ratio, but is negative and significant at the 1% level in the equation for bank borrowing and is positive and significant at 1% in the Other Liabilities equation. Insignificance with respect to the debt ratio could be due to the opposite effects of the two constituent parts of debt cancelling each other out. The negative correlation between cash flow and bank loans is consistent with the pecking order hypothesis. That is, firms with large cash flows tend to use them rather than use bank loans because the agency cost of the former is lower. At the same time, firms with large cash flows tend to use informal financial transactions rather than bank loans. With regard to the non-debt-tax shield, we found no results consistent with our theoretical predictions.

Our results clearly indicate that Quasi Self-Finance is negatively correlated with all the debt indicators: the debt ratio, bank borrowing and Other Liabilities. The results suggest that Quasi Self-Finance resembles self-finance with a low agency cost. Furthermore, firms' preference order for it is before Other Liabilities. Quasi Self-Finance is similar to genuine self-finance.

(2) Participation in Organized Capital Markets

Listing Dummy significantly affects the debt ratio, which is consistent with our descriptive observations in section 3. The magnitude of the negative effect of Listing Dummy is greater in the Other Liabilities equation than in the one for bank borrowing.

In our framework, the results can be interpreted as follows. Participation in the capital market reduces the agency cost of equity finance, and thereby makes the agency cost of informal finance relatively high. The firms' IPO behaviour makes the agency cost of bank borrowing relatively high, but the difference between its agency cost and that of informal finance also increases. This suggests that firms' participation in organized capital markets has the 'by-product effect' of reducing informational asymmetries through the disclosure of information not only in the securities market, but also in (formal) indirect financial markets. In other words, in the listing behaviour of firms, there is an externality in terms of information.

(3) Business-Group Affiliation and Foreign Ownership

The estimated coefficient of Foreign Firm Dummy suggests that debt ratios and bank borrowing are relatively low. Foreign firms tend to rely less on debt finance and more on equity finance. This finding is consistent with the fact that many foreign firms have been established by recent direct investment, with their capital being formed by multinational companies.

The effect of Financial Conglomerate Dummy is unexpected. Firms affiliated to this business group have average debt ratios. However, with regard to debt composition, the coefficient of the dummy is significant and negative with respect to bank borrowing and significant and positive in the equation for Other Liabilities. It is hard to imagine that such firms face stricter credit restrictions than other firms because commercial banks

are overwhelmingly the major suppliers of credit in Thai financial markets. Hence, their high dependence on Other Liabilities suggests that group firms tend to access commercial bank credit not through formal bank loans, but through informal channels redirected by affiliated firms or owner families.

(4) Short-Term and Long-Term Loans

Table 9 presents the estimation results when the dependent variables are short- and long- term loans. The coefficients of the control variables are almost the same as those of bank borrowing. With regard to firm ownership, Foreign Firm Dummy is significant and negative with respect to both long-term and short-term borrowing, which is indicative of the low level of bank borrowing. The coefficient of Financial Conglomerate Dummy is not significant in the equation for long-term borrowing, but is significant and negative in the equation for short-term borrowing. Firms affiliated to Financial Conglomerates depend less on short-term bank borrowing, which may be substituted by informal credit.

The coefficient of Listing Dummy is not significant with respect to short-term borrowing, but has a strong negative coefficient in the equation for long-term borrowing. This suggests that the funds raised from the capital market substitute for long-term loans.

5. Estimation of Equipment Investment

5.1. Model and Variables

In this section, we examine the impact of firm ownership and capital structure on firms' investment behaviour by estimating a simple investment function. Given data availability and accuracy, we estimate the following reduced-form equation based on the neo-classical-type investment function:

$$INV = \alpha_0 + \alpha_1 ROA + \alpha_2 CAC + \alpha_3 FIXASSET + \alpha_4 DR + \alpha_5 BU + \alpha_6 LONG + \alpha_7 FCD + \alpha_8 FOD + \alpha_9 LIST + \alpha_{10} IND$$

where:

INV: Equipment Investment = Log (Fixed Assets / Fixed Assets in last year);

ROA: Return on Assets = Profit before Tax / Total Assets;

CAC: Capital Cost = Interest Expense / Debt;

FIXASSET: Fixed Asset = Log (Fixed Assets);

DR: Debt Ratio = Debt / Total Assets;

BU: Bank Borrowing = Bank Borrowing / Total Assets;

Long: Long-Term Loans = Long-Term Loans / Total Assets;

FCD: Financial Conglomerate Dummy;

FOD: Foreign Dummy;

LIST: Listing Dummy;

IND: Industrial Dummy (Vector).

The first four variables are typical control variables for an investment function. IND controls for differences in technology. We focus on the effect of firm characteristics and indicators of the capital structure, such as the debt ratio, bank borrowing and long-term borrowing, on credit restrictions and the agency costs associated with investment, which may promote investment.

Unfortunately, our data set does not include depreciation, so the investment level may be crudely measured. We did not succeed in the estimation of a Tobin's Q-type investment function. Our estimation follows Suto (2003), who dealt with similar data availability problems to successfully estimate investment function for Malaysian firms.

5.2. Estimation Results

The estimation results are presented in Table 10. Of the control variables, ROA is either not significant or is negative and significant in some cases. Capital costs and fixed assets are highly significant with the expected signs. The estimation results could be seen as reasonable.

Our findings on the effect of the capital structure are interesting. The debt ratio itself is not significant. However, when bank borrowing is included as an independent variable, the coefficient of the debt ratio is insignificant and negative and that of bank borrowing is significant and positive. This implies that debt itself does not promote investment, but bank borrowing does so strongly. The coefficient of long-term borrowing is significant and positive, but when this is included, the coefficient of bank borrowing is insignificant. This suggests that long-term loans promote investment, probably more effectively than bank borrowing overall.

Financial Conglomerate Dummy has a negative coefficient in two of the three cases. Investment by foreign firms (Foreign Dummy) is slightly above average. We found no significant difference in investment between listed and non-listed companies.

6. Concluding Remarks

Our findings can be summarized as follows. First, the debt ratio depends on whether firms are public companies (listed on the securities exchange). The debt ratios of listed firms are higher than those of non-listed firms. For both types of firm, there was no evidence that debt ratios increased in the early 1990s. This finding contrasts with those of Claessens et al. (1998) and the World Bank (1998).

Second, the low debt ratios of listed firms are simply a reflection of increased capital accounts generated by initial public offerings in the form of stock premiums or capital

surpluses. On the other hand, listed firms' ratios of other liabilities in debt composition are much lower than those of non-listed companies, whereas bank-borrowing ratios hardly differ. Listing on the stock exchange seems to reduce the agency cost of equity finance. More importantly, however, it also seems to widen the disparity in the agency costs associated with bank borrowing and informal borrowing, which leads firms to prefer bank borrowing. This may be a result of the enhanced disclosure of information required by the capital market, which represents an externality effect of listing by firms.

Third and unexpectedly, firms in the financial conglomerates group depend more on informal finance and less on bank loans, particularly on short-term loans. They are also relatively inactive investors. Foreign firms have lower bank loans, and hence, their debt ratios are lower. However, their investment ratios are higher. This suggests that capital and credit transfers from parent multinational companies reduce capital costs, and thereby promote investment.

Fourth, on the relationship between capital structure and investment, we found clear evidence of a relationship in the case of bank loans and long-term loans, but not in the case of the debt ratio. Bank loans, particularly long-term loans, weaken credit restrictions, and lower capital costs promote investment. Moreover, long-term borrowing as a proportion of total loans is very low in listed firms. The long-term borrowing of listed firms is evidently replaced by cash or by credit from the capital market. Such substitution, however, does not promote firms' investment, because there is no difference between listed and non-listed firms in terms of equipment investment.

In terms of its role in fund mobilization, Thailand's capital market was not a substitute for, but a complement to, the indirect financial market in the early 1990s. In addition, bank loans, particularly long-term loans, promoted investment, whereas equity

finance did not. Policy agendas to redesign the financial system following the crisis should be consistent with such fund mobilization behaviour by firms and with the current functions of Thailand's capital market, which has been historically formed.

The features and relationships identified in this paper are no more than fact findings. The mechanisms behind them require more investigation, which remains a task for future research.

References

- Amano, Yuko and Fumiharu Mieno, 1998, Future challenges for the economic recovery of Thailand. *Journal of Development Assistance*, 5, 1, pp.1-55
- Booth, Laurence, Varouj Aivazian, Asli Demirguc-Kunt and Vojislav Maksimovic, 2001, Capital structures in developing countries. *Journal of Finance*, LVI(1), pp. 87–130.
- Claessens, Stijin, Simeon Djankov and Larry Lang, 1998, East Asian corporate growth, financing and risks over the last decade. Policy Research Working Paper, WPS2017, The World Bank.
- Fazzari, Steven M., R. Glenn Hubbard and Bruce C. Petersen, 1988, Financing Constraints and Corporate Investment. *Brookings Papers on Economic Activity*, No. 1.
- Hoshi, Takeo, Anil Kashyap and David Scharfstein, 1991, Corporate structure, liquidity, and investment: evidence from Japanese industrial groups. *Quarterly Journal of Economics*, 106, pp.30-60
- Myers, Stewart C., 1984, The capital structure puzzle. *Journal of Finance*, 39, pp.575-592
- and Nicholas S. Majluf, 1984, Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13, pp.187-221
- Singh, Ajit, 1995, Corporate Financial Patterns in Industrializing Economies: A Comparative International Study. Technical Paper, No.2, Washington, D.C.: International Finance Corporation.

- and Javed Hamid, 1992, *Corporate Financial Structures in Developing Countries*. Technical Paper, No.1, Washington, D.C.: International Finance Corporation.
- Suehiro, Akira, 1989, *Capital Accumulation in Thailand 1855–1985*. Centre for East Asian Cultural Studies, Tokyo.
- , 2000, *Tai Daikigyo no Deta to Bunseki—Kokueikigyo, Takokusekikigyo, Zaibatu Gurupu* (Data and Analysis of Thai Large Companies—State Enterprise, Multi-National Companies and Business Groups). Research Report No. 28, Institute of Social Science, Tokyo University (in Japanese).
- , 2001, *Family Business Gone Wrong? Ownership Patterns and Corporate Performance in Thailand*. ADB Institute Working Paper No.19.
- Suto, Megumi, 2003, *Capital structure and investment behaviour of Malaysian firms in the 1990s – a study of corporate governance before the crisis*. *Corporate Governance: an International Review*, 11, 1
- Titman, Sheridan and Roberto Wessels, 1988, *The determinants of capital structure choice*. *Journal of Finance*, 43, pp.1-19
- Wiwattanakantang, Yupana, 1999, *An empirical study on the determinants of the capital structure of Thai firms*. *Pacific-Basin Financial Journal*, 7, pp.371-403
- , 2001, *Controlling shareholders and corporate value: Evidence from Thailand*. *Pacific-Basin Finance Journal*, 9, pp.323-362

Table 1. Number of Samples and Firms

	Financial	Foreign	Others	Total	
	Conglomerate	Owned			Listed
Samples					
1991	19	66	200	285	106
1992	20	64	214	298	109
1993	20	66	220	306	109
1994	20	67	225	312	110
1995	21	62	212	295	109
Total	100	325	1071	1496	543
Firms					
Full Panel	18	52	178	248	104
4 years	2	15	34	51	4
3 years	1	2	18	21	3
Total	21	69	230	320	111

Table 2. Distribution of Firms by Type of Business Group

Industrial Classification	Financial Conglomerate		Manufacturing Group		Foreign Owned		Others			Total	
		Listed		Listed		Listed		Listed		Listed	
Food Processing	13	2 (15%)	14	8 (57%)	9	3 (33%)	34	11 (32%)	70	24 (34%)	
Textile and Garment	0	0	13	9 (69%)	6	3 (50%)	23	13 (57%)	42	25 (60%)	
Wooden Products	0	0	0	0	1	1 (100%)	7	3 (43%)	8	4 (50%)	
Pulp and Paper	2	1 (50%)	7	0 (0%)	2	1 (50%)	12	6 (50%)	23	8 (35%)	
Chemical Products	0	0	11	5 (45%)	15	2 (13%)	20	7 (35%)	46	14 (30%)	
Non-steel Metal	1	0	7	1 (14%)	3	3 (100%)	16	10 (63%)	27	14 (52%)	
Primal Metal	0	0	0	0	1	0 (0%)	0	0	1	0 (0%)	
Metal and Machinery	3	0 (0%)	14	1 (7%)	27	4 (15%)	26	11 (42%)	70	16 (23%)	
Total	19	3 (16%)	66	24 (36%)	64	17 (27%)	138	61 (44%)	287	105 (37%)	

Note. Sample of 1994

Table 3. Capital Structure Classified by Type of Business Group and Ownership Nationality Listed Firms

	All Firms	Financial Conglomerate	Foreign Owned	Non-Group
Debt	55.3%	55.7%	48.8%	56.4%
Bank Borrowing	42.6%	50.0%	32.9%	44.1%
Short-Term	24.5%	45.2%	20.7%	24.5%
Long -Term	18.1%	4.8%	12.2%	19.6%
Quasi Self-Finance	0.7%	0.0%	2.2%	0.4%
Borrowings from Managers and employees	0.0%	0.0%	0.0%	0.0%
Borrowings from Affiliated Companies	0.6%	0.0%	2.2%	0.4%
Others	10.6%	6.8%	9.9%	10.9%
Trade Accounts and Note Payable	5.3%	3.4%	4.9%	5.4%
Others	6.7%	2.3%	8.8%	6.5%
Equity	44.8%	46.8%	51.2%	43.6%
Paid up Capital	13.8%	16.5%	12.9%	13.9%
Retained Earnings	20.0%	16.4%	25.9%	19.1%
Capital Surplus and Others	10.9%	14.0%	12.4%	10.5%

Non-Listed Firms

	All Firms	Financial Conglomerate	Foreign Owned	Non-Group
Debt	70.9%	81.8%	65.5%	72.4%
Bank Borrowing	42.4%	23.2%	32.3%	48.8%
Short-Term	22.0%	11.8%	20.3%	23.7%
Long -Term	20.4%	11.4%	11.9%	25.1%
Quasi Self-Finance	7.9%	13.6%	13.3%	4.9%
Borrowings from Managers and employees	0.9%	1.0%	0.7%	0.9%
Borrowings from Affiliated Companies	7.1%	12.6%	12.7%	4.0%
Others	20.7%	45.0%	19.9%	18.8%
Trade Accounts and Note Payable	13.0%	10.6%	12.6%	13.4%
Others	7.6%	34.4%	7.3%	5.4%
Equity	30.4%	18.2%	34.5%	29.6%
Paid up Capital	13.8%	12.2%	11.8%	14.9%
Retained Earnings	17.6%	6.7%	20.2%	17.4%
Capital Surplus and Others	-1.0%	-0.7%	2.5%	-2.7%

Note. Sample of 1994

Table 4. Capital Structure Classified by Years
Listed Firms

	1991	1992	1993	1994	1995
	84	84	84	84	84
Debt	58.5%	57.1%	57.1%	55.6%	60.7%
Bank Borrowing	44.7%	45.1%	35.8%	43.4%	47.7%
Short-Term	21.6%	23.2%	21.4%	24.1%	24.7%
Long -Term	23.1%	21.9%	14.4%	19.2%	23.0%
Quasi Self-Finance	1.3%	1.1%	1.6%	0.4%	0.8%
Borrowings from Managers and employee	0.1%	0.1%	0.7%	0.0%	0.0%
Borrowings from Affiliated Companies	1.2%	1.0%	0.9%	0.4%	0.8%
Others	12.5%	10.9%	19.7%	11.8%	12.1%
Trade Accounts and Note Payable	5.8%	5.4%	7.1%	5.3%	5.2%
Others	6.7%	5.5%	12.6%	6.5%	6.9%
Equity	41.5%	43.4%	42.9%	44.4%	40.3%
Paid up Capital	13.8%	13.7%	13.7%	13.5%	12.1%
Retained Earnings	16.1%	17.4%	17.3%	19.9%	19.0%
Capital Surplus and Others	12.2%	12.8%	14.3%	14.3%	13.6%

Non-Listed Firms

	1991	1992	1993	1994	1995
	90	90	90	90	90
Debt	77.7%	77.9%	78.2%	71.5%	69.7%
Bank Borrowing	48.2%	50.2%	50.4%	48.2%	45.9%
Short-Term	19.2%	22.3%	21.4%	22.4%	22.2%
Long -Term	29.0%	27.9%	29.0%	25.7%	23.6%
Quasi Self-Finance	3.9%	4.6%	4.1%	4.9%	3.6%
Borrowings from Managers and employee	0.7%	0.5%	0.8%	1.0%	0.4%
Borrowings from Affiliated Companies	3.2%	4.1%	3.3%	3.9%	3.2%
Others	25.6%	23.1%	24.0%	18.4%	20.2%
Trade Accounts and Note Payable	15.2%	14.4%	16.4%	13.7%	12.5%
Others	10.4%	8.7%	7.6%	4.7%	7.7%
Equity	23.1%	22.7%	22.2%	29.5%	31.4%
Paid up Capital	14.1%	13.1%	12.7%	14.1%	13.6%
Retained Earnings	10.4%	10.3%	11.4%	16.9%	18.0%
Capital Surplus and Others	1.8%	2.1%	2.5%	2.7%	3.4%

Table 5. The Level of Equipment Investment Classified by Year

	1991	1992	1993	1994	1995
Listed Firms					
Fixed Asset/T.A.	43.5%	43.1%	38.4%	40.0%	38.2%
Rate of Change		14.1%	-0.9%	24.0%	13.4%
Investment/T.A.		6.1%	-0.4%	9.2%	5.4%
Average T.A.(1)	2,462	2,838	3,155	3,760	4,465
Rate of Change		15.3%	11.2%	19.2%	18.7%
Non-Listed Firms					
Fixed Asset/T.A.	40.6%	37.9%	37.6%	49.3%	48.7%
Rate of Change		24.8%	13.3%	52.8%	23.9%
Investment/T.A.		10.1%	5.1%	19.9%	11.8%
Average T.A.(1)	2,040	2,729	3,119	3,637	4,559
Rate of Change		33.8%	14.3%	16.6%	25.3%

Note. (1) Million of Bahts

Table 6. The Level of Fixed Asset and Equipment Investment Classified by Business Group and Ownership Nationality

	All Firms	Financial Conglomerate	Foreign Owned	Others
Listed Firms				
Fixed Asset / T.A.	38.7%	23.9%	35.6%	45.1%
Investment / T.A.	5.3%	1.8%	6.9%	7.3%
Average T.A.(1)	3,488	3,206	3,211	2,549
Non Listed Firms				
Fixed Asset / T.A.	43.2%	19.3%	46.5%	49.0%
Investment / T.A.	10.9%	2.8%	10.7%	15.7%
Average T.A.(1)	3,328	2,024	3,663	2,779

Note. (1) Million Baht

Table 7. Change of Capital Structures and Equipment Investment before and after IPOs

Period (0=the period of IPO)	-2	-1	0	1	2
Number of Samples	12	23	33	40	43
Debt	73.3%	60.7%	52.2%	54.8%	52.2%
Bank Borrowing	55.5%	43.0%	37.4%	39.4%	36.6%
Short-Term	23.0%	24.9%	24.3%	27.3%	27.5%
Long -Term	32.5%	18.1%	13.1%	12.1%	9.0%
Quasi Self-Finance	2.9%	3.5%	2.0%	1.4%	2.1%
Borrowings from Managers and employees	0.0%	0.3%	0.2%	0.1%	0.0%
Borrowings from Affiliated Companies	2.8%	3.2%	1.8%	1.3%	2.0%
Others	14.9%	14.2%	12.7%	14.1%	13.5%
Trade Accounts and Note Payable	8.2%	6.2%	6.4%	6.7%	5.6%
Others	6.8%	8.0%	6.4%	7.4%	7.9%
Equity	33.0%	39.3%	47.8%	45.2%	47.8%
Paid up Capital	24.8%	20.8%	17.9%	16.7%	15.8%
Retained Earnings	8.3%	10.7%	11.4%	11.0%	12.9%
Capital Surplus and Others	0.5%	7.8%	19.9%	17.9%	20.3%
Fixed Asset/T.A.	66.4%	30.3%	45.3%	41.2%	31.2%
Investment/T.A.	2.5%	-15.6%	29.1%	7.3%	6.2%
Average T.A.(1)	2,703	2,622	2,449	2,553	2,617

Table 8. Estimation Results of Capital Structure

	Debt Ratio		Bank Borrowing		Short-Term		Long-Term		Other Debt	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Adjusted Least Squares	0.3521		0.2328		0.1006		0.2033		0.1351	
<u>Control Variables</u>										
Constant	0.6254	38.644 [.000]	0.4096	25.251 [.000]	0.2128	15.120 [.000]	0.1968	14.299 [.000]	0.2158	15.228 [.000]
Total Asset	4.26E-12	2.989 [.003]	6.13E-12	4.287 [.000]	-1.58E-12	-1.276 [.202]	7.71E-12	6.360 [.000]	-1.87E-12	-1.494 [.135]
Variation of Profit	-4.43E-01	-6.807 [.000]	-3.18E-01	-4.880 [.000]	-1.65E-01	-2.915 [.004]	-1.53E-01	-2.771 [.006]	-1.25E-01	-2.187 [.029]
Retained Earning	4.16E-03	0.195 [.846]	-7.23E-02	-3.376 [.001]	1.20E-02	0.643 [.520]	-8.42E-02	-4.638 [.000]	7.64E-02	4.086 [.000]
Non debt tax shield	-3.12E-11	-1.544 [.123]	-3.80E-11	-1.878 [.061]	-9.53E-13	-0.054 [.957]	-3.71E-11	-2.158 [.031]	6.84E-12	0.386 [.699]
<u>Determinant Factors</u>										
Quasi-Self Finance	-0.5281	-17.113 [.000]	-0.3425	-11.071 [.000]	-0.1704	-6.349 [.000]	-0.1720	-6.556 [.000]	-0.1857	-6.870 [.000]
Dummy for Financial Conglomerate	-0.0039	-0.171 [.864]	-0.0838	-3.637 [.000]	-0.0636	-3.177 [.002]	-0.0203	-1.037 [.300]	0.0799	3.967 [.000]
Dummy for Foreign Firms	-4.83E-02	-3.379 [.001]	-5.18E-02	-3.616 [.000]	-2.78E-02	-2.240 [.025]	-2.40E-02	-1.972 [.049]	3.51E-03	0.281 [.779]
Dummy for Listed Firms	-0.1436	-11.981 [.000]	-0.0553	-4.603 [.000]	0.0116	1.114 [.265]	-0.0669	-6.567 [.000]	-0.0883	-8.413 [.000]
<u>Industrial Dummy</u>										
Food Processing	0.0753	4.643 [.000]	0.0634	3.903 [.000]	0.0270	1.916 [.056]	0.0364	2.641 [.008]	0.0118	0.834 [.404]
Textile and Garment	-0.0340	-1.799 [.072]	-0.0054	-0.283 [.777]	0.0127	0.771 [.441]	-0.0180	-1.121 [.262]	-0.0287	-1.731 [.084]
Wooden Products	-0.0453	-1.304 [.192]	-0.0440	-1.264 [.207]	-0.0772	-1.124 [.011]	0.0332	1.124 [.261]	-0.0013	-0.043 [.965]
Pulp and Paper	-0.0071	-0.307 [.759]	0.0593	2.557 [.011]	-0.0138	-0.683 [.495]	0.0731	3.713 [.000]	-0.0664	-3.277 [.001]
Chemical Products	0.0260	1.479 [.139]	0.0033	0.187 [.851]	-0.0321	-2.095 [.036]	0.0354	2.364 [.018]	0.0227	1.475 [.140]
Non-Steel Metal	-0.0182	-0.854 [.394]	0.0049	0.231 [.817]	-0.0770	-4.163 [.000]	0.0820	4.531 [.000]	-0.0231	-1.239 [.216]
Primal Metal	-0.0415	-0.452 [.652]	0.0456	0.496 [.620]	0.1282	1.606 [.109]	-0.0826	-1.058 [.290]	-0.0871	-1.083 [.279]

Note: the figure in square brackets are the P-values of the coefficients

Table 9. Estimation Results of Capital Structure (continued)

	Debt Ratio		Bank Borrowing		Short-Term		Long-Term		Other Debt	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Adjusted Least Squares	0.3528		0.2250		0.1879		0.1248		0.1011	
<u>Control Variables</u>										
Constant	0.6301	42.176 [.000]	0.3849	25.563 [.000]	0.2140	16.467 [.000]	0.1709	13.318 [.000]	0.2451	18.619 [.000]
Total Asset	3.88E-12	2.667 [.008]	5.56E-12	3.792 [.000]	-1.12E-12	-0.884 [.377]	6.68E-12	5.346 [.000]	-1.68E-12	-1.311 [.190]
Variation of Profit	-3.41E-01	-3.298 [.001]	-4.53E-01	-4.349 [.000]	-2.27E-01	-2.530 [.012]	-2.25E-01	-2.542 [.011]	1.12E-01	1.232 [.218]
Profit	-1.80E-01	-1.148 [.251]	8.25E-02	0.521 [.603]	1.44E-01	1.051 [.294]	-6.12E-02	-0.453 [.651]	-2.63E-01	-1.898 [.058]
Non debt tax shield	-2.36E-11	-1.113 [.266]	-4.23E-11	-1.979 [.048]	-6.79E-12	-0.368 [.713]	-3.55E-11	-1.950 [.051]	1.87E-11	1.001 [.317]
<u>Determinant Factors</u>										
Quasi-Self Finance	-0.5281	-17.133 [.000]	-0.3462	-11.142 [.000]	-0.1697	-6.326 [.000]	-0.1765	-6.667 [.000]	-0.1819	-6.696 [.000]
Dummy for Financial Conglomerate	-0.0048	-0.209 [.834]	-0.0720	-3.146 [.002]	-0.0654	-3.307 [.001]	-0.0067	-0.342 [.732]	0.0673	3.360 [.001]
Dummy for Foreign Firms	-4.74E-02	-3.341 [.001]	-5.77E-02	-4.030 [.000]	-2.73E-02	-2.214 [.027]	-3.03E-02	-2.486 [.013]	1.02E-02	0.818 [.413]
Dummy for Listed Firms	-0.1433	-11.954 [.000]	-0.0555	-4.596 [.000]	0.0113	1.088 [.277]	-0.0669	-6.496 [.000]	-0.0877	-8.306 [.000]
<u>Industrial Dummy</u>										
Food Processing	0.0743	4.584 [.000]	0.0656	4.016 [.000]	0.0274	1.943 [.052]	0.0382	2.744 [.006]	0.0087	0.609 [.543]
Textile and Garment	-0.0351	-1.852 [.064]	-0.0046	-0.244 [.808]	0.0134	0.817 [.414]	-0.0181	-1.113 [.266]	-0.0304	-1.823 [.069]
Wooden Products	-0.0483	-1.392 [.164]	-0.0350	-1.002 [.317]	-0.0764	-2.530 [.012]	0.0414	1.387 [.166]	-0.0133	-0.434 [.664]
Pulp and Paper	-0.0088	-0.385 [.700]	0.0699	3.021 [.003]	-0.0145	-0.726 [.468]	0.0844	4.280 [.000]	-0.0787	-3.892 [.000]
Chemical Products	0.0253	1.440 [.150]	0.0058	0.330 [.741]	-0.0320	-2.090 [.037]	0.0378	2.505 [.012]	0.0195	1.256 [.209]
Non-Steel Metal	-0.0199	-0.940 [.348]	0.0124	0.582 [.561]	-0.0771	-4.180 [.000]	0.0895	4.917 [.000]	-0.0324	-1.732 [.084]
Primal Metal	-0.0443	-0.484 [.628]	0.0729	0.791 [.429]	0.1248	1.569 [.117]	-0.0519	-0.661 [.509]	-0.1171	-1.454 [.146]

Note: the figure in square brackets are the P-values of the coefficients

Table 10. Estimation Results of Investment Functions

	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Adjusted Least Squares	0.113		0.119		0.131	
<u>Control Variables</u>						
Constant	4.112	11.767 [.000]	4.337	12.121 [.000]	4.586	12.717 [.000]
ROA	-0.487	-1.9324 [.054]	-0.435	-1.7256 [.085]	-0.357	-1.4245 [.155]
Capital Cost	-1.205E-05	-1.445 [.149]	-9.323E-06	-1.1139 [.266]	-1.032E-05	-1.2413 [.215]
Log of Fixed Asset at last period	-0.194	-11.515 [.000]	-0.205	-11.875 [.000]	-0.217	-12.487 [.000]
<u>Determinant Factors</u>						
Debt	0.071	0.8246 [.410]	-0.154	-1.3019 [.193]	-0.115	-0.9763 [.329]
Bank Borrowing			0.349	2.7364 [.006]	0.064	0.4407 [.660]
Long-term Borrowing					0.534	4.0226 [.000]
Dummy for Financial Conglomerate	-0.123	-1.719 [.086]	-0.105	-1.4691 [.142]	-0.131	-1.8288 [.068]
Dummy for Foreign Firms	0.068	1.5158 [.130]	0.078	1.7204 [.086]	0.080	1.7914 [.074]
Dummy for Listed Firms	0.034	0.8812 [.378]	0.023	0.5995 [.549]	0.046	1.1854 [.236]
<u>Industrial Dummy</u>						
Food Processing	-0.144	-2.7864 [.005]	-0.144	-2.8128 [.005]	-0.151	-2.9637 [.003]
Textile and Garment	-0.119	-1.99 [.047]	-0.121	-2.0403 [.042]	-0.113	-1.9122 [.056]
Wooden Products	-0.055	-0.4991 [.618]	-0.052	-0.4707 [.638]	-0.088	-0.8001 [.424]
Pulp and Paper	0.074	1.0373 [.300]	0.057	0.7952 [.427]	0.034	0.4747 [.635]
Chemical Products	0.028	0.5146 [.607]	0.038	0.6873 [.492]	0.015	0.2647 [.791]
Non-steel Metal	0.062	0.9209 [.357]	0.063	0.9435 [.346]	0.022	0.3314 [.740]
Primal Metal	0.193	0.6781 [.498]	0.144	0.5073 [.612]	0.168	0.5979 [.550]

Note: the figure in square brackets are the P-values of the coefficients

Appendix. List of Business Groups and No. of Firms in Sample

	No. of Firms	
		Listed
Total	287	105
Others (Independent)	138	61
Foreign Owned	64	17
Sub total of Domestic Business Group	85	27
Total of Financial Conglomerate	19	3
Bangkok Bank Group	2	0
BMB Group	8	0
TCC Group	2	0
Thai Farmers/Loxley	7	3
Total of Manufacturing Group	66	24
Betagro Group	1	0
Boon Rawd Brewery	3	1
CP Group	7	5
Laemthong Group	1	0
Metro Group	3	2
Osoth/Premier	1	0
P Charoen Pan	1	1
Saha Group	5	5
Saha-Union	2	2
Shinawatra	1	0
Siam Cement Group	6	1
Siam Chemical	9	1
Siam Group	5	0
Siam Steel Group	1	1
Siam Steel Pipe	1	0
Srifuengfung	6	2
Sukree=TBI	3	1
Thai Roong Ruang	1	0
Thai Summit	2	0
Thai Union	3	1
Thonburi Phanich	1	0
TPI/Hong Yiah Seng	2	0
Unicord Group	1	1

Source: Suehiro[2000], Table 4-6 and Appendix Table 1

¹ In relation to this argument, Wiwattanakantang (2001) and Suehiro (2000) examine the corporate governance structure of Thai firms. The latter present a sceptical, suspicious view of linear causality between the governance structure and corporate performance.

² In Amano and Mieno (1998), we tried to estimate a Tobin's-Q type investment function for Thai manufacturing firms to investigate their investment behaviour in relation to subsidies. However, we could not obtain stable estimation results.

³ The definition of 'Large Firms' follows the criteria adopted by the Industrial Financial Corporation of Thailand (IFCT) in 1998.

⁴ The Alien Business Act of the early 1990s does not allow foreigners to hold more than 50% of the shares in a Thai company. Hence, the investment shares of multinational companies are usually between 40% and 49% at most.

⁵ In actual calculations, 'Quasi Self-Finance' compositions are deduced from debt.

⁶ See footnote 5.

⁷ As a result, there is no substantial difference between the two variables in the context of estimation.