# Foreign Ownership and Firm Financing Constraint in Indonesia

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*Abstract*

*This paper reveals why foreign ownership participation matters in the sensitivity relationship between investment and the internal liquidity of listed companies in Indonesia. This paper finds that foreign-owned enterprises are less financially constrained than domestic-owned ones, especially in terms of short-term investment following a financial crisis. Empirical evidence is provided by dividing 157 firms listed on the Jakarta Stock Exchange for at least five consecutive years between 1994 and 2004 into foreign-owned enterprises, and comparing their financing constraints and performance before and after the financial crisis during that period. The results also demonstrated that post-crisis foreign-owned enterprises performed better with higher sales, greater market opportunity and less leverage, leading to lower financing constraint. Subsequently, foreign-owned enterprises have a better capacity to invest more than local-owned ones.*

## 1. Introduction

Recent strategic management studies suggest that firm-specific factors are important in explaining the differential performance of firms (Rumelt et al., 1991). Firm-specific factors include property rights (ownership structure), financial resources, organizational process, management team skills etc., which are commonly linked to various firm performance indicators, such as profitability and firm value.

Instead of investigating the firm performance, this paper is concerned with the relationship between ownership characteristics and investment behaviour in the midst of a financial crisis. The formal question is whether firms with a high level of foreign ownership (hereafter "foreign-owned enterprises") perform better than ones with little or no foreign ownership (hereafter "domestic-owned enterprises") under financial turbulence in Indonesia. To examine the impact of a crisis on firm-level investment, this paper focuses on the problem of financing constraint of firms. Performance is analysed, however, as an important

explanation of the firm capacity to invest in which better performance should be better investment opportunity (capacity).

Studies on foreign companies in developing countries are always challenging, even though a huge amount of research has addressed this classical research question. This paper proposes a different perspective from common research in the field, which usually focus on profitability or firm value (Tobin's Q), by concentrating on investment behaviour. Investment is measured as spending on fixed assets as long-term investment and inventory as short-term investment. This paper intends to investigate the behaviour of the two groups of firms, foreign-owned and domestic-owned enterprises, in two different periods, namely pre- and post-crisis.

This study brings empirical evidence of investment response of foreign-owned enterprises in Indonesia to the severe crisis. More specifically, this study examines the sensitivity gap between investment and internal liquidity among foreign-owned and domestic-owned enterprises listed on the Jakarta Stock Exchange (JSX). Our hypothesis is that firm with a higher level of foreign ownership participation should be less financially constrained and performs better than firms with a lower proportion of foreign ownership. This study includes all non-financial firms listed on JSX for at least five consecutives years during 1994 to 2004, 157 firms in total. Panel data analysis was employed to obtain explanation of the behaviour of individual firms in both time periods.

This paper is organized as follows. Section 2 describes the theoretical review by focusing on the role of foreign companies in developing countries, and a short introduction to the Indonesian crisis. Section 3 contains empirical research. Description of data and discussion of findings are in Section 4. And Section 5 is the conclusion, including suggestions for further research.

**2. Foreign-owned Enterprises in Developing Countries**

Following the financial crisis around developing countries, there is a growing interest among researchers to examine the different responses of foreign- and domestic-owned enterprises. Nowadays, the presence of foreign ownership in developing countries is a common phenomenon. Much research, therefore, has been carried out to address this issue. Recently, studies on the impact of a financial crisis on firms with foreign ownership have gained attention.

From the perspective of the Resource-Based View (RBV), firm performance is basically heterogeneous in terms of efficiency and competitive capability, which would be reflected in the competitive performance of firms (Wernerfelt, 1984; Barney 1991). Sinha (1993) found that foreign equity participation is associated with higher productivity. Haddad and Harrison (1993), using a panel of Moroccan manufacturing firms, found that although foreign-owned enterprises had higher productivity levels, they did not have faster rates of productivity growth. Aitken and Harrison (1999) used a panel of Venezuelan firms to provide evidence that there is a negative spill over of foreign-owned enterprises as the productivity of domestic-owned enterprises decreases.

Moreover, Foreign Direct Investment (FDI) is usually assumed as the institution diffuses firm-specific assets such as technology, managerial ability, corporate governance, and access to the networks connecting to foreign markets (Kimura and Kiyota, 2004). Kimura and Kiyota (2004) explain that once foreign-owned enterprises set up a certain level of ownership in the equity of a firm, they acquire the power of control over the management of the firm and consequently are more receptive to transferring firm-specific assets.

In East Asian countries, firms with foreign ownership are significantly more productive than those without foreign ownership (Hallward-Driemeier, 2002). Doms and

Jensen (1998) found that foreign-owned plants were more productive, more capital intensive and paid higher wages than domestic-owned enterprises even after controlling for industry, size, location and plant age.

However, heterogeneity of firms is relatively subtle. Heterogeneous competitive performance emerges from heterogeneous factors such as input, resource, process, context, managerial capabilities, financing policies and so on. We argue that examination of firms facing financial crisis should provide valuable case studies for gaining pertinent understanding of the heterogeneity of firms. Financial crisis gives a particular context to firms where the heterogeneity of each firm becomes more and more evident. Why do firms react differently when facing external shock? Why do some firms collapse and others survive? What determines the success or failure of firms facing financial crisis? These questions are especially relevant for discussion since a series of crises in the last decade.

Currency depreciations are an ordinary phenomenon in history. However, large currency depreciation like that in the latter half of the 1990's became an extraordinary event for various countries around the world, especially Mexico (1995) and East Asian countries (1997), with consequent effect on firms in those countries. From a macroeconomic perspective, currency depreciations in most cases are usually followed by a surge in production and improvement in economic growth, while in other cases are followed by a decline in output and severe recession (Forbes, 2002). In the East Asian region, there is strong evidence that the currency depreciation drove countries into deep and long-lasting severe economic crisis.

From a microeconomic perspective, the monetary condition could directly induce firm level investment by the mechanism of interest rate fluctuation. There are two ways in which monetary policies are linked to firm-level policies. First, the interest rate influences the cost of

capital rather than firm investment. Second, the interest rate induces firm net cash flow (i.e., cash flow after interest payments). Therefore, the impact of monetary policies following an exchange rate fluctuation would be based on two aspects: the availability of external funds and the composition of the financial debt.

By surveying literature on foreign-owned enterprises in emerging countries, this paper suggests that there are at least three principal branches of studies concerning this issue. The first branch focuses on firms' performance by focusing on the problems of productivity and spill over. Pfaffermayr and Bellak (2000) describe that the positive effects of participating in a foreign multinational's network can mainly be found in productivity and profitability.

The second branch is concerned with financing policies and capital structure of multinational firms. Lee and Kwok (1998) examined various multinational companies' debt-equity ratios by focusing on the increase in the agency cost of debt of international activities. The third and most recent branch focuses on financial shocks. Some research has been done on the impact of large currency depreciation on firm performance (Forbes, 2002; Desai, Foley and Forbes, 2004). Several studies have focused on empirical evidence in East Asian countries (Claessens, Djankov and Xu, 2000) and Indonesia (Blalock, Gertler and Levine, 2005).

Based on firm-level data, this paper argues that following financial crisis foreign-owned enterprises have a higher investment level since they can resolve more easily their financing constraints than domestic-owned enterprises. While domestic-owned enterprises have to struggle in rescuing their financial situation, which is followed by decline in investment level, especially in the presence of a credit crunch, foreign-owned enterprises have a better opportunity to relieve their financing constraints.

By empirical study, Blalock, Gertler and Levine (2005) found that foreign-owned enterprises, which have greater access to overseas financing, could overcome liquidity constraints during financial crisis. Desai, Foley and Forbes (2004) also provide evidence on the responses of the affiliates of multinational firms, which can expand sales, assets and investment after currency depreciation, thus mitigating some of the aggregate effects of the currency crisis. In contrast, local firms experience difficulties such as decrease in operating activity.

In Indonesia, even though net exporting firms should benefit from better terms of trade and increase in investment following currency depreciation, the credit crunch following a twin crisis in the banking and currency sectors in Indonesia prevented domestic-owned enterprises from accessing credit, while foreign-owned enterprises relatively easily overcame this constraint since their parent companies provided access to overseas credit (Blalock and Gertler, 2005).

## 3. Empirical Research

### 3.1. Investment Equation

To deal with the question of which group performs better, foreign- or domestic-owned companies, in the pre- and post-crisis periods, this paper employs a relatively rigorous equation measuring the sensitivity of firm-level investment and liquidity.

Since the seminal paper of Fazzari, Hubbard and Petersen (FHP, 1988), the issue of financing constraints and firms' investment has been a popular debate among scholars[1]. FHP (1988) show that firms, which are identified, a priori, as financially constrained have greater sensitivity in investment to the availability of internal finance in terms of cash flow. In their

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[1] Different from Modigliani and Miller (1958), FHP (1988) assume that external finance is more expensive because of the presence of asymmetric information.

proposition of a financing constraint paradigm, they claim that the sensitivity of investment and liquidity is driven by the presence of asymmetric information in a capital market.

This argument is substantially different from the neoclassical perspective on investment such as that of Modigliani and Miller (MM, 1958), who propose the irrelevance of financial structure theory by explaining that financial policy is not applicable to real investment decisions under certain conditions[2]. On the other hand, FHP (1988) propose that the theoretical model of imperfection in capital markets implies that external financing is more costly than internal financing for many firms. Since the degree of asymmetric information and agency costs depends on a firm's characteristics, certain firms may be more sensitive to financial factors than others. In other words, industrial and individual characteristics of the firms become important determinants of investment sensitivity to internal finance (cash flow).

Investment is significantly correlated with proxies for change in net worth or internal funds. In this paper, as in many studies, especially FHP (1988), the effect of financing is measured by the ratio of cash flow to capital stock $\left(\frac{CF}{K}\right)$. A large body of research has found that investment and cash flow sensitivities are higher for financially constrained firms (FHP, 1998; Chirinko and Kalckreuth, 2002).

To provide empirical evidence, this paper uses the basic equation originally developed by FHP (1988) as follows:

$I = f$(*Investment opportunities*) $+ g$(*Internal funds*)

or

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[2] In their seminal paper, "Theory of Capital Structure" in 1958, MM assume that a firm's financial structure will not affect its market value in a frictionless capital market: they assume that information is perfect in a capital market.

(1)

$$\frac{I_{it}}{K_{it-1}} = f\left(\frac{X_{it}}{K_{it-1}}\right) + g\left(\frac{CF_{it}}{K_{it-1}}\right) + \varepsilon_{it}$$

where $I_{it}$ represents investment in fixed assets for firm $i$ during period $t$, $X$ represents a vector of variables, and $\varepsilon$ is an error term for $i$ and $t$.

Following FHP (1988), function $g$ depends on a firm's internal cash flow (*CF*), which represents the potential sensitivity of investment to fluctuations in available internal finance, after investment opportunities are controlled for through the variable *X*. All variables are divided by the paid-in capital at the beginning of the period ($K_{t-1}$).

It is common to categorize the sensitivity of internal capital and investment according to the characteristics of a firm, such as low or high dividend payout rate (FHP, 1998), Keiretsu or independent firms (Hoshi et al., 1991), bond rating (Whited, 1992), and tradable or non-tradable sector (Espanol 2005). Since the interest of this research resides in the question of foreign-owned enterprises, regression was performed for different categories of firm, namely foreign-owned enterprises (hereafter FOE) and domestic-owned enterprises (hereafter DOE)[3]. This paper categorizes investment into two types, fixed assets as a proxy for long-term investment and inventory as a proxy for short-term investment. To capture the sensitivity of Foreign-owned enterprises and Domestic-owned enterprises, this paper uses equation (2) as follows.

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[3] For the sake of simplicity, we define a firm with foreign ownership participation as FOE and all other firms as DOE. This definition is to avoid confusion with Multi National Corporations (MNCs). This study is not about MNCs, but firms with majority foreign ownership.

(2)

$$\frac{I_{it}}{K_{it-1}} = \alpha_{cfFOE}\left(\frac{CF_{it}}{K_{it-1}}\right) * FOE + \alpha_{cfDOE}\left(\frac{CF_{it}}{K_{it-1}}\right) * DOE + \alpha_q TobinQ_{it} + \alpha_s\left(\frac{S_{it}}{K_{it-1}}\right) +$$

$$\alpha_{wk}\left(\frac{\Delta WK_{it}}{K_{it-1}}\right) + \alpha_d\left(\frac{D_{it}}{K_{it-1}}\right) + \varepsilon_{it}$$

where:

| | | |
|---|---|---|
| K | = | Fixed assets |
| I | = | Long-term or gross investment ($K_t - K_{t-1}$) and short-term investment (Inventory $_t$ – Inventory $_{t-1}$) |
| CF | = | Cash flow |
| Q | = | Tobin's Q (market capitalization deflated by book value) |
| S | = | Total sales |
| ΔWK | = | Change in working capital (current assets – current liabilities) |
| D | = | Total debt |
| FOE | = | "1" if a firm has more than 50 percent foreign ownership participation (Foreign-owned enterprises) and "0" for all other firms (Domestic-owned enterprises) |
| DOE | = | Domestic-owned enterprises |

*3.2 Variables*

*3.2.1. Investment*

Firm-level investment is generally considered the combined value of machinery, plants and buildings that are bought by firms for production purposes. Accordingly, this paper uses fixed assets as a proxy for long-term investment. Theoretical prediction estimates that financially constrained firms can be identified and should display a stronger sensitivity of investment to cash flow (FHP, 1988; Chirinko and Kalckreuth, 2002; Bruinshoofd, 2003). In this case, if Foreign-owned enterprises face larger financing constraints than Domestic-owned enterprises, it should be expected that $\alpha_{cfFOE}$ is higher than $\alpha_{cfDOE}$

*3.2.2. Cash Flow*

In Fazzari, Ferri and Greenberg (2003), we find that in the Keynesian endogenous investment model, if cash flow is insufficient to finance investment, firms take on debt. The

implication is that investment activities should be financed primarily by internal finance. In this case, cash flow should be negatively correlated to firm investment.

Recently, a large body of literature suggested that because of information asymmetries and capital market imperfections, corporate investment expenditure is significantly influenced by the internal ability of firms to generate internal cash. This indicates that the firms prefer internal equity rather than external debt, meaning investment is negatively correlated with debt.

### 3.2.3. Tobin's Q

Tobin's Q is associated with a firm's market capitalization, reflecting the market anticipation of the profitability of a firm's investment. Tobin's Q is measured by the market value of assets deflated by their book value. In this paper, $\alpha_q$ is expected to be positive and statistically significant.

### 3.2.4. Profitability

In this paper, sales in the previous period are used as a proxy for profitability. Generally it is assumed that profitability will increase with investment. Thus, we expected that profitability would be positive and statistically significant. Profitability is considered to be an indicator of the past and potential future performance of a firm. This is consistent with the sales accelerator model: a higher level of sales will enhance production capacity in order to meet enlarged demand (FHP, 1988).

*3.2.5. Working Capital*

Fazzari and Petersen (1993) describe that working capital is current assets (chiefly accounts receivable, inventory and cash) less current liabilities (primarily accounts payable and short-term debt), and measures the firm's net liquid assets. Due to financing constraint, Fazzari and Petersen (1993) argue that it is costly for firms to change the level of fixed investment, and thus they seek to maintain a stable fixed-investment path, all other things being equal, by adjusting working capital. This argument is comparable with the hypothesis on internal net worth of Bernanke and Gertler (1989).

External finance, if available, may be more costly than internal finance because of transaction costs, agency problems, or asymmetric information. Thus, all other things being equal, when firms choose to decrease (increase) working capital investment, fixed investment should rise (fall).

In this case, $\alpha_{wk}$ is expected to be negative and statistically significant.

*3.2.6. Debt*

There are two opposing theoretical analyses about the relationship between a firm's leverage and cash flow. Trade-off theory suggests a positive relationship (MM, 1958), while pecking order behaviour implies a negative relationship (Myers and Majluf, 1984). Meanwhile, signalling theory suggests that a higher debt ratio can be considered as a signal of improved capacity to finance investment, and hence the relationship between debt and investment is expected to be positive.

**4. Data and Results**

*4.1. Data set*

For this study, all non-financial listed companies on the Jakarta Stock Exchange (JSX) were included by using yearly accounting data from the JSX database. However, since this database lacks sufficient data, data to complete the data set was obtained from the Indonesian Capital Market Directory (ICMD) provided by ECFIN, a private consulting enterprise.

Initially, 298 firms were selected. However, since only those firms listed on JSX for at least 5 five consecutives years were to be included, the sample decreased to 234 firms. Furthermore, since from the standard deviation and median, there was wide fluctuation in the data, firms with median of more than 1.5 and standard deviation of more than 11 percent were excluded. Finally, 157 firms in the period 1994 to 2004 were selected as the sample data set in this study.

To split the data set into two different groups for the purpose of this study, degree of foreign participation was used as a proxy for foreign-owned enterprises. "Dominating shareholder" was defined as meaning ownership of more than 50 percent, namely, ownership level that can dominate the decision making of firms.

Concerning the period for examining the behaviour of the two groups of firms, pre-crisis was defined as 1994 to 1996 and post-crisis was defined as 1999 to 2004. We excluded the period during the crisis, 1997 and 1998, since it was considered that there would have been many extraordinary events influencing firms. During the period of the crisis, many firms in Indonesia suffered significant financial difficulties.

For the definition of foreign-owned enterprises and domestic-owned enterprises, data of firm's ownership structure was taken using two proxies: ownership structure in 1996

representing the pre-crisis period and that in 2003 for the post-crisis period. The distribution of the samples is described as follows (Tables 1 and 2). In the sample data set of 157 firms, 20 were categorized as foreign-owned enterprises and 137 as domestic-owned enterprises. Among foreign-owned enterprises 16 were tradable and 4 were non-tradable firms.

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Table 1 & 2 about here
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*4.2. Univariate Analysis*

Tables 3 and 4 summarize the descriptive statistics for the Foreign-owned enterprises and Domestic-owned enterprises. Mean investment variable data show that Domestic-owned enterprises (0.2753) have a higher investment level than Foreign-owned enterprises (0.0303). Meanwhile, mean inventory was higher for Foreign-owned enterprises (3.8222) than for Domestic-owned enterprises (3.3927). To evaluate significant difference between the two groups of firms, the t-test was performed for the mean, median and variance differences.

There was no significant difference between mean investment of foreign-owned enterprises and that of domestic-owned enterprises. This was also the case for the inventory variable. However, significant differences in the median for both variables was observed[4], indicating that investment of domestic-owned enterprises was at a higher level than that of foreign-owned enterprises (significant at the 10 percent level), whereas there was no significant difference for the inventory of either group. Meanwhile, testing for difference in variance showed that domestic-owned firm investment was much more volatile than foreign-owned firm investment. However, the data indicated no significant difference in variance for inventory between domestic-owned enterprises and foreign-owned enterprises.

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[4] To test for significant difference of the median, the Wilcoxon Mann-Whitney rank sum test, provided by the STATA statistical software program, was employed.

Tables 3 and 4 provide descriptive statistics for cash flow. The cash flow of foreign-owned enterprises and domestic-owned enterprises seemed comparable. There was no significant difference by t-test for the mean, however, foreign-owned enterprises were indicated to have higher cash flow by t-test for median difference. Variance difference indicated that domestic-owned enterprises were likely to have more volatile cash flow than foreign-owned enterprises.

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Table 3&4 about here
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Two important observations in the univariate analysis were expected to be sales and debt. Tests for both mean and median differences showed that foreign-owned enterprises had better sales and less debt than domestic-owned enterprises. Test for variance difference showed that foreign-owned enterprises were more stable for both variables than those of domestic-owned enterprises. Thus, it can be concluded that foreign-owned enterprises had better and more stable performance than domestic-owned enterprises.

By univariate analysis, it was rigorously found that domestic-owned enterprises had a greater debt ratio than foreign-owned enterprises. These findings are consistent with those of other previous studies that investment in developing countries mostly is financed by external debt[5]. Moreover, foreign-owned enterprises have less severe problems in both long-term (fixed assets) and short-term (inventory) investment. It is important to note that, by observing the descriptive data, it seemed that foreign-owned enterprises preferred not to outlay in long-term investment. On the other hand, the performance of short-term investment and other

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[5] See for example, Pomerleano, 1998, Claessens *et al.*, 2000, Booth *et al.*, 2001 and Allayannis *et al.*, 2003.

measurements, such as working capital and sales, were better for Foreign-owned enterprises than domestic-owned enterprises.

Overall, it should be noted that domestic-owned enterprises had a much higher level of debt compared to domestic-owned enterprises. In terms of firm-level performance, measured by inventory, sales and working capital, foreign-owned enterprises showed better indices than domestic-owned enterprises. However, investment in fixed assets by foreign-owned enterprises was lower than that of domestic-owned enterprises.

**Figure 1. Median Cash Flow**
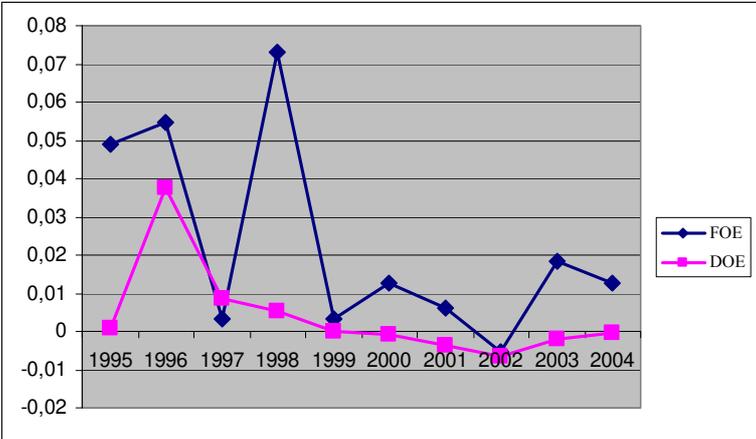


Note: FOE is foreign-owned enterprises and DOE is domestic-owned enterprises

**Figure 2. Median Inventory**
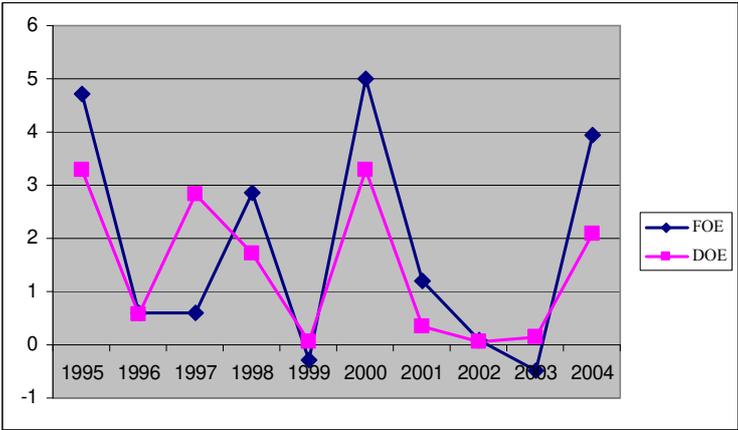


Note: FOE is foreign-owned enterprises and DOE is domestic-owned enterprises

**Figure 3. Median Sales**
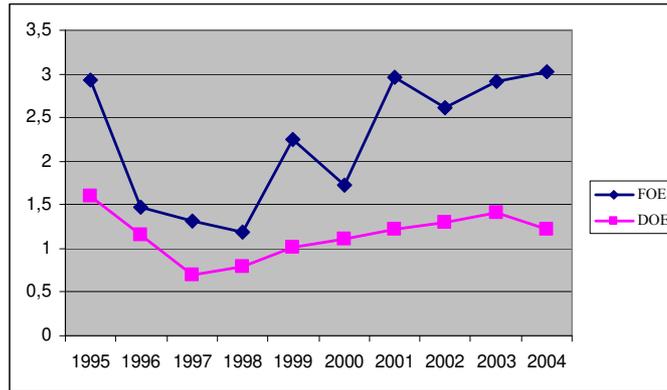


Note: FOE is foreign-owned enterprises and DOE is domestic-owned enterprises

*4.3. Multivariate Analysis*

*4.3.1. Financing Constraint and Firm Investment*

Three methods were used for regression: (1) Ordinary Least Square (OLS) robust or OLS with correction for heteroscedasticity problem, (2) fixed effect (FE) and random effect (RE) methods. OLS provides basic multivariate correlation embedded in the data, a method much criticized since the estimations do not control for unobservable characteristics that could be biasing the estimated coefficients. The FE method corrects some discrepancies by controlling for some of these unobservable characteristics using dummy variables. However, FE estimation neglects all cross-sectional variation, which is fulfilled by RE estimates.

To decide which method to select, the OLS or FE method, the F-test from the FE method was used. If we could reject the null hypothesis at its traditional value, the FE method would be selected over the OLS method. Secondly, the Breusch and Pagan Lagrangian Multiplier (LM) test was performed to select between the OLS and RE methods. If the LM test rejected the null hypothesis at its traditional value, RE should be selected. And for selecting between FE and RE, the Hausman test was performed. The FE method would be selected if the null hypothesis at its traditional value is rejected.

Tables 6 and 7 provide the results of baseline regressions. Table 6 shows the regression for investment in both the pre- and post-crisis periods, whereas Table 7 provides the results for inventory. After considering the results of the F-test, LM test and Hausman test, the FE method seemed the most favourable for evaluating investment for the total period.

The findings indicated that for the total period, both foreign-owned enterprises and domestic-owned enterprises, a priori, had no significant financing constraints. The sensitivity relationship between internal cash flow and investment was comparable for both groups. However, it seemed that foreign-owned firm cash flow (-0.0568) was slightly more sensitive to investment than domestic-owned firm cash flow (-0.9104).

Table 6 also shows that investment behaviour of firms listed on JSX is strongly influenced by sales, working capital and debt. Sales and debt are positively and significantly correlated with investment, whereas working capital has a negative correlation. Moreover, debt has a relatively high level of correlation (0.5688) with investment, which could mean that firms have to augment the level of debt to enhance investment.

Table 7 shows that the F-test for the FE method could not reject the null hypothesis, but the LM test showed statistical significance. This means that, *a priori*, the RE method is more favourable than the OLS robust and FE methods.

In terms of inventory or short-term investment, neither foreign-owned enterprises nor domestic-owned enterprises had significant financing constraint in the total period, since the correlation coefficient between internal finance and investment was negative. However, broadly speaking, domestic-owned enterprises had a tendency of higher sensitivity of internal finance than foreign-owned enterprises, which could mean that domestic-owned enterprises have greater problems in internal finance than foreign-owned enterprises. In the case of

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domestic-owned enterprises, cash flow was negatively and significantly correlated to inventory, meaning that to maintain inventory firms had to employ internal finance.

Generally, for all the firms, debt was not a significant factor for inventory. Otherwise, sales and working capital were positively and significantly correlated to inventory. This is consistent with the theoretical prediction that inventory is associated with sales: more sales requiring more inventories.

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Table 5 about here
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Table 6&7
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*4.3.2. Pre- and Post-Crisis Investment Behaviour*

Table 6 shows the results of pre- and post-crisis estimates for investment, whereas Table 7 demonstrates the results for inventory. For Table 6, FE was selected for estimates in the pre- and post-crisis periods. From the results, foreign-owned enterprises seemed to have had no significant financing problems, since the traditional value of the investment-internal finance sensitivity was not significant.

Meanwhile, domestic-owned enterprises had significant negative correlation between cash flow and investment in the pre-crisis period, whereas in the post-crisis period the coefficient turned positive. It seemed that domestic-owned enterprises had no financing constraint in the pre-crisis period, but did in the post-crisis period.

The empirical evidence also showed that in the pre-crisis period, working capital was negatively correlated to investment but debt was positively correlated to investment. It seemed that firms rely much on debt or external finance to support their investment activities. In post-crisis, debt was still correlated positively to investment, but the coefficient (0.3846) was much smaller than that in the pre-crisis period (1.0972). This evidence strongly supports the analysis that in the pre-crisis period, firms in Indonesia were much exposed to external finance.

In the post-crisis period, working capital and sales correlated positively with investment. It seemed that the listed companies tended to prefer internal finance over-external finance to support their investment. To obtain greater profit meant a requirement for more investment, with working capital also associated positively with investment. This concurs with the findings of Fazzari and Petersen (1993) who argue that when there is a shortage of financing for investment, working capital will be firstly employed to support investment

activities. In the post-crisis period in Indonesia, since external financing was constrained due to the credit crunch[6], investment decreased with working capital.

It is not surprising that debt level positively correlated with investment in the total period, both the pre- and post-crisis periods, in Indonesia. According to many previous studies, most companies in Indonesia and other countries in the South East Asia region were financed by external debts (see for example Claessens et al., 2000). The argument is that since the level of debt was relatively high in the pre-crisis period, firms had to access debt at a high level in the post-crisis period to support their activities at the same level as that in the pre-crisis period. Furthermore, to repay their high level debt they had to have high level debt also.

In terms of inventory activities, neither foreign-owned enterprises nor domestic-owned enterprises had any significant problems in internal finance: sales were positively correlated to inventory both in the pre- and post-crisis periods.

## 5. Conclusion

This paper found that foreign-owned enterprises have lower commitment to long-term investment (fixed assets) compared to domestic-owned enterprises, even though the spending on short-term investment (inventory) was higher than that of domestic-owned enterprises. Foreign-owned enterprises tended to postpone long-term investment commitment in the aftermath of the 1997 financial crisis in Indonesia. More specifically, foreign owners appeared reluctant to spend their budget on financing fixed asset transactions, Indonesia failing to attract foreign investment in such an economic climate.

The findings also demonstrate that compared to domestic-owned enterprises, foreign-owned enterprises suffered fewer severe problems due to financial crisis, even though their spending on fixed-asset investment was lower than that of domestic-owned enterprises. This

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[6] Study of Bank Indonesia shows this evidence of credit crunch. See Juda et al., (2000)

may shed light on the reason why foreign-owned enterprises had a more stable level of operations than domestic-owned enterprises. The argument that foreign-owned enterprises performed better operationally is supported by the evidence that foreign-owned enterprises had better performance from working capital and sales than domestic-owned enterprises. Meanwhile, domestic-owned enterprises were much more exposed to external finance or debts than foreign-owned enterprises. Based on this evidence, the tentative conclusion of this study is that foreign-owned enterprises are less financially constrained following financial crisis in Indonesia than domestic-owned ones.

The main contribution of this paper is to provide empirical evidence of the differential behaviour of investment, both long-term and short-term, among Indonesian firms with and without majority foreign ownership participation. This paper also brings an understanding of the relationship of debts, firm profitability and other variables related to investment of firms in financial crisis. For future research, differentiation of other ownership characteristics would be interesting to develop, such as banking and non-banking ownership, family and non-family ownership, state and non-states ownership etc.

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## Table 1. Sample Distribution

| Firm type | Tradable | Non-tradable | Sample |
|---|---|---|---|
| All companies | 110 | 47 | 157 |
| Foreign-owned firm (FOF) | 16 | 4 | 20 |
| Domestic-owned firm (DOF) | 94 | 43 | 137 |

## Table 2. Distribution by Sector

| Sector | FOE | DOE |
|---|---|---|
| Agriculture | 1 | 5 |
| Mining | 3 | 4 |
| Basic industry & chemical | 2 | 41 |
| Miscellaneous industry | 5 | 23 |
| Consumer good industry | 5 | 19 |
| Property, real estate & building construction | 1 | 5 |
| Infrastructure, utilities & transportation | 1 | 12 |
| Trade, service & investment | 2 | 28 |
| Total | 20 | 137 |

## Table 3. Summary of Descriptive Statistics (FOE)

| Variables | | Mean | Std. Dev. | Min | Max | Observations |
|---|---|---|---|---|---|---|
| Investment | overall | 0,0303 | 0,4815 | -0,7822 | 3,2691 | N = 192 |
| | between | | 0,5005 | -0,7236 | 3,2691 | n = 111 |
| | within | | 0,2804 | -0,6529 | 1,9105 | T-bar = 1.72973 |
| Inventory | overall | 3,8222 | 10,0550 | -14,7943 | 57,0464 | N = 192 |
| | between | | 10,7253 | -13,2860 | 57,0464 | n = 111 |
| | within | | 5,5337 | -19,4154 | 34,0598 | T-bar = 1.72973 |
| Cash Flow | overall | 0,0424 | 0,2313 | -0,9087 | 1,3127 | N = 192 |
| | between | | 0,2483 | -0,9087 | 0,8123 | n = 111 |
| | within | | 0,1280 | -0,5766 | 1,1925 | T-bar = 1.72973 |
| Tobin Q | overall | 0,7891 | 6,2062 | -74,5800 | 23,2179 | N = 192 |
| | between | | 7,4226 | -74,5800 | 15,2752 | n = 111 |
| | within | | 2,3290 | -17,9297 | 19,8480 | T-bar = 1.72973 |
| Sales | overall | 2,3990 | 1,8443 | 0,1046 | 7,9696 | N = 192 |
| | between | | 1,9229 | 0,2613 | 7,9696 | n = 111 |
| | within | | 0,5701 | -0,0939 | 4,5232 | T-bar = 1.72973 |
| Working capital | overall | 0,0956 | 0,5820 | -2,0492 | 2,8503 | N = 192 |
| | between | | 0,6106 | -2,0492 | 2,8503 | n = 111 |
| | within | | 0,3473 | -1,6232 | 1,8838 | T-bar = 1.72973 |
| Debt | overall | 1,3860 | 0,9848 | 0,1160 | 6,2506 | N = 192 |
| | between | | 0,8771 | 0,1160 | 3,5212 | n = 111 |
| | within | | 0,4503 | -0,6482 | 4,1154 | T-bar = 1.72973 |

**Table 6.4. Summary of Descriptive Statistics (DOE)**

| Variables | | Mean | Std. Dev. | Min | Max | Observations | |
|---|---|---|---|---|---|---|---|
| Investment | overall | 0,2753 | 2,7894 | -0,9612 | 62,1890 | N = | 1250 |
| | between | | 2,5614 | -0,9612 | 46,5678 | n = | 694 |
| | within | | 1,9489 | -6,4943 | 56,2701 | T-bar = 1.80115 | |
| Inventory | overall | 3,3927 | 10,9538 | -35,5681 | 68,4024 | N = | 1250 |
| | between | | 8,8598 | -35,5681 | 68,4024 | n = | 694 |
| | within | | 8,0264 | -43,3258 | 58,6125 | T-bar = 1.80115 | |
| Cash Flow | overall | 0,0480 | 0,4779 | -5,0614 | 7,8443 | N = | 1250 |
| | between | | 0,4007 | -1,8307 | 6,6026 | n = | 694 |
| | within | | 0,3575 | -4,4943 | 7,0794 | T-bar = 1.80115 | |
| Tobin Q | overall | 0,9941 | 3,2281 | -56,8902 | 32,0961 | N = | 1249 |
| | between | | 2,3383 | -14,0412 | 32,0961 | n = | 694 |
| | within | | 2,5642 | -50,0456 | 25,2715 | T-bar = 1.79971 | |
| Sales | overall | 2,0031 | 2,8815 | 0,0147 | 38,9956 | N = | 1250 |
| | between | | 2,4157 | 0,0147 | 38,9956 | n = | 694 |
| | within | | 1,6502 | -4,3478 | 32,3916 | T-bar = 1.80115 | |
| Working Capital | overall | -0,0018 | 1,4556 | -18,2008 | 17,4635 | N = | 1250 |
| | between | | 1,4713 | -13,1026 | 17,4635 | n = | 694 |
| | within | | 0,9300 | -16,3273 | 12,0002 | T-bar = 1.80115 | |
| Debt | overall | 2,0059 | 3,0705 | 0,0526 | 47,3772 | N = | 1250 |
| | between | | 2,7761 | 0,0526 | 37,2297 | n = | 694 |
| | within | | 1,9835 | -4,8505 | 43,9390 | T-bar = 1.80115 | |

**Table 5. Summary of Tests of Significant Differences**

*, **, *** denote significance at the 10,5 and 1 percent level, respectively.

| Variable | Mean diff | | Median diff | | Variance diff |
|---|---|---|---|---|---|
| Investment | 1.2140 | | 1.802 | * | *** |
| Inventory | -0.5112 | | -0.101 | | |
| Cash Flow | 0.1585 | | -2.288 | ** | *** |
| Tobin | 0.7032 | | -1.262 | | *** |
| Sales | -1.8462 | * | -4.976 | *** | *** |
| Working Capital | -0.9156 | | -3.097 | *** | *** |
| Debt | 2.7751 | *** | 2.900 | *** | *** |

**Table 6. Result of Regression for Investment**

The dependent variable is investment, proxied by the change in capital stock (fixed assets). This variable is defined as $\left(\dfrac{FA_t - FA_{t-1}}{FA_{t-1}}\right)$, where FA is fixed-assets. OLS Robust is OLS with correction for heteroscedasticy problem (the White method). *,**,*** denote significance at the 10,5 and 1 percent levels, respectively. Standard deviation is reported in parentheses.

| | Total Period | | | Pre-Crisis | | | Post-Crisis | | |
|---|---|---|---|---|---|---|---|---|---|
| | *OLS Robust* | *Fixed-Effect* | *Random-Effect* | *OLS Robust* | *FixedEffect* | *Random Effect* | *OLS Robust* | *Fixed-Effect* | *RandomEffect* |
| CF-FOE | -0,0196 | -0,0568 | -0,0275 | 1,0076 *** | 0,0429 | 0,5907 | -0,3155 | -0,2865 | -0,3266 |
| | (0,2474) | (0,9792) | (0,5912) | (0,2921) | (1,5153) | (1,2801) | (0,2592) | (0,6587) | (0,4497) |
| CF-DOE | 0,0270 | -0,9104 *** | -0,0041 | -0,7895 * | -0,7363 *** | -0,8854 *** | 2,0144 * | -0,0450 | 1,8860 *** |
| | (0,7538) | (0,1414) | (0,1160) | (0,4421) | (0,2695) | (0,1829) | (1,0489) | (0,1602) | (0,1281) |
| Tobin's Q | 0,0252 *** | 0,0101 | 0,0227 * | 0,1292 * | 0,0621 | 0,0907 | 0,0074 * | -0,0078 | 0,0063 |
| | (0,0091) | (0,0180) | (0,0134) | (0,0744) | (0,2182) | (0,0825) | (0,0040) | (0,0122) | (0,0097) |
| Sales | 0,0962 | 0,1130 *** | 0,1197 *** | -0,2951 *** | -0,0791 | -0,3190 *** | 0,1378 ** | 0,0597 ** | 0,1572 *** |
| | (0,0624) | (0,0320) | (0,0210) | (0,0858) | (0,1256) | (0,0435) | (0,0601) | (0,0267) | (0,0169) |
| Working Capital | -0,6236 *** | -0,4291 *** | -0,6007 *** | -0,6129 *** | -0,4121 *** | -0,5112 *** | -0,1091 | 0,1946 *** | -0,0930 *** |
| | (0,2292) | (0,0585) | (0,0383) | (0,2235) | (0,1526) | (0,0902) | (0,0901) | (0,0512) | (0,0341) |
| Debt | 0,4213 *** | 0,5688 *** | 0,4337 *** | 0,9438 *** | 1,0972 *** | 1,0275 *** | 0,1841 ** | 0,3846 *** | 0,1957 *** |
| | (0,1443) | (0,0293) | (0,0198) | (0,1151) | (0,0737) | (0,0406) | (0,0806) | (0,0416) | (0,0186) |
| Constant | -0,7847 *** | | | -0,6019 *** | | | -0,5835 ** | | |
| | (0,2508) | | | (0,1733) | | | (0,2354) | | |
| | | | | | | | | | |
| No. of observations | 1441 | 1441 | 1441 | 241 | 241 | 241 | 914 | 914 | 914 |
| $R^2$ | 0.4579 | 0.6003 | 0.5644 | 0.9008 | 0.9064 | 0.7781 | 0.4663 | 0.2439 | 0.7054 |
| | | | | | | | | | |
| F-test | | 1.41 *** | | | 3.40 *** | | | 1.93 *** | |
| Breusch and Pagan LM test | | | 20.46 *** | | | 2.58 | | | 1.42 |
| Hausman test | | 250.57 *** | | | 108.25 *** | | | 486.15 *** | |

**Table 7. Result of Regression for Inventory**

The dependent variable is inventory. In this model, inventory is defined as $\left(\dfrac{Inventory_t - Inventory_{t-1}}{FA_{t-1}}\right)$, where FA is fixed-assets. FA or capital stock is employed to deflate all variables, except Tobin Q, in the equation. OLS Robust is OLS with correction for heteroscedasticy problem (the White method). *,**,*** denote significance at the 10,5 and 1 percent levels, respectively. Standard deviation is reported in parentheses. In this regression, Hausman tests were not performed since the random-effects estimator has degenerated to pooled OLS and the Wald test from xthausman may not be appropriate.

| | Total Period | | | Pre-Crisis | | | Post-Crisis | | |
|---|---|---|---|---|---|---|---|---|---|
| | *OLS Robust* | *Fixed-Effect* | *Random-Effect* | *OLS Robust* | *Fixed-Effect* | *Random-Effect* | *OLS Robust* | *Fixed-Effect* | *Random-Effect* |
| CF-FOE | -3,9532 | -11,6713 * | -3,9532 | 5,0571 * | 9,0606 | 5,0571 | -6,2471 * | -15,0739 * | -6,2471 |
| | (3,2917) | (6,5198) | (3,2900) | (3,0060) | (16,5591) | (7,2249) | (3,7681) | (8,2582) | (4,1639) |
| CF-DOE | -1,5891 | -1,6735 * | -1,5891 ** | 0,0327 | -2,7853 | 0,0327 | -4,7497 *** | -6,3027 *** | -4,7497 *** |
| | (1,0423) | (0,9412) | (0,6493) | (1,2101) | (2,9450) | (0,9943) | (1,4849) | (2,0088) | (1,1811) |
| Tobin's Q | 0,0058 | 0,0078 | 0,0058 | 0,1695 | 2,7090 | 0,1695 | 0,0026 | -0,0653 | 0,0026 |
| | (0,0395) | (0,1201) | (0,0748) | (0,3387) | (2,3848) | (0,3856) | (0,0397) | (0,1534) | (0,0893) |
| Sales | 0,7972 *** | 0,3821 * | 0,7972 *** | 0,3921 | 3,6782 *** | 0,3921 ** | 0,9470 *** | 0,1009 | 0,9470 *** |
| | (0,2272) | (0,2129) | (0,1118) | (0,3648) | (1,3721) | (0,2046) | (0,3166) | (0,3344) | (0,1478) |
| Working Capital | 0,4409 * | 0,4887 | 0,4409 ** | 1,4071 * | 2,6224 | 1,4071 *** | 0,2301 | 0,2844 | 0,2301 |
| | (0,2341) | (0,3895) | (0,2136) | (0,8598) | (1,6675) | (0,4740) | (0,2942) | (0,6423) | (0,3156) |
| Debt | -0,0061 | 0,2984 | -0,0061 | 0,6021 * | -0,0814 | 0,6021 *** | -0,0278 | 1,0341 ** | -0,0278 |
| | (0,1250) | (0,1950) | (0,1088) | (0,3676) | (0,8052) | (0,2135) | (0,1725) | (0,5216) | (0,1668) |
| Constant | 1,9020 *** | | | 0,9129 | -8,0826 | 0,9129 | 1,3838 ** | | |
| | (0,3906) | | | (0,6910) | (4,0810) | (0,7208) | (0,6298) | | |
| | | | | | | | | | |
| No. of observations | 1441 | 1441 | 1441 | 241 | 241 | 241 | 914 | 914 | 914 |
| R$^2$ | 0.0412 | 0.0228 | 0.0557 | 0.1596 | 0.2999 | 0.1965 | 0.0544 | 0.0418 | 0.0751 |
| | | | | | | | | | |
| F-test | | 0.73 | | | 0.54 | | | 0.71 | |
| Breusch and Pagan LM test | | | 3.87 ** | | | 11.97 *** | | | 0.27 |

28