

INTERACTION BETWEEN INCENTIVE TO EXPROPRIATE AND INVESTMENT OPPORTUNITIES AS A DETERMINANT OF OVERINVESTMENT PROBLEM IN INDONESIA

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ABSTRACT

The study investigates if the level of investment opportunities reduces the positive impact of expropriation incentive on the level of overinvestments. Under the condition of capital constraint, high incentive of controlling shareholders to expropriate firms' wealth do not necessarily result in overinvestments if firms have abundant investment opportunities. The study also examine if positive investment-cash flow sensitivity still exists after a significant corporate governance reforms in Indonesia. The study finds no positive relation between investments and cash flow. It documents that overinvestments primarily occur in firms whose controlling shareholders have small ownership. Further, it documents that higher investment opportunities mitigate the effect of expropriation incentive on overinvestments.

Keywords: expropriation incentive, investment-cash flow sensitivity, investment opportunities, overinvestment

INTRODUCTION

The objectives of the study are: first, to investigate if positive cash-flow investment sensitivity in general exists in Indonesia, more than ten years after the East Asian financial crisis; second, to examine if such sensitivity predominantly is a result of overinvestments caused by expropriation incentive by controlling shareholders and; third, to investigate whether overinvestments primarily occur in firms with bad prospect (i.e., low investment opportunities).

One explanation of the positive relation between level of investments and operating cash flow is the existence of asymmetric information and capital

market imperfection. Capital market imperfections and asymmetric information cause financial constrain to the firm and consequently, the cost of external financing is more expensive than cost of internal financing. Managers must rely on internal cash flow to finance the firm's projects and thus if firm faces a limitation in cash flow or financial constraint, managers tend to pass up a positive a positive net present value projects. Thus, a positive relationship between cash flow and investment is an indication of *underinvestment* (Myers & Majluf, 1984). Fazzari, Hubbard and Petersen (1988), Hubbard (1998), Ağca and Mozumdar (2008) show that firms with high level of financial constraints tend to have higher investment-cash flow sensitivity (i.e. their investment are more profound to cash flow).

However, a recent study conducted by Chen and Chen (2012) that employ U.S. listed firms as the samples find that the positive investment-cash flow sensitivity has disappeared recently. They suggest given that financial constraints still profound, the positive investment-cash flow relation found in the past cannot be attributed by financial constraints. They suggest alternative explanations for the disappearance, but in the end they conclude that there is no definite answer and the cause for the disappearance remains a puzzle.

Since the ownership structure of U.S. listed firms typically is highly dispersed, Chen and Chen (2012) do not consider the effect of ownership structure on investment-cash flow sensitivity as addressed by Wei and Zhang (2008) and explained as follow. Degryse and de Jong (2006) and Wei and Zhang (2008) provide alternative view about a positive relationship between cash flow and firm's capital investments. The view focuses on the manifestation of agency problem in firm capital investment (Jensen, 1986; 1993). Large free cash flow in a firm induces managers to squander it for their own private benefit. The managers tend to overspend their cash flow to unprofitable projects (i.e., overinvestment) if they convince there will be more assets under their control. Thus, a positive relationship between cash flow and investment is an indication of *overinvestment* or *empire-building*.

Wei and Zhang (2008) suggest that firms in the U.S. and East Asian countries reveal strongly positive investment cash-flow sensitivities but based on different reasons. In the U.S. firms, the result supports the *underinvestment* hypothesis caused by asymmetric information (Hadlock, 1998), meanwhile in East Asian firms, the empirical finding supports the *overinvestment* hypothesis caused by agency costs of free cash flow (Wei & Zhang, 2008). Wei and Zhang (2008) argue that this difference in empirical finding may be caused by the difference in the agency problem that each economy faces. In the U.S., the conflict of interest is between managers and shareholders, while the agency

problem in East Asia primarily is due to the conflict of interest between controlling shareholders and non-controlling shareholders.

Controlling shareholders are encouraged to expropriate non-controlling shareholders (through among others overinvestment) if their control rights are higher than their cash flow rights (Claessens, Djankov, & Lang, 2000). Thus, the incentive to expropriate increases as cash flow rights decreases and as the difference between control rights and cash flow rights (i.e., cash flow leverage) increases. Wei and Zhang (2008) then hypothesise that overinvestments (underinvestments) exist when the positive relation between cash flow and investment decreases as cash flow rights increases (decreases), or when cash flow leverage decreases (increases). Using the period of the study (year 1991–1996) before the East Asian financial crisis, their findings are consistent with the overinvestment hypothesis and thus, they conclude that the positive association between cash flow and investment in East Asian countries (including Indonesia) is due to overinvestment resulting from expropriation of controlling shareholders.

After the crisis, governments in the region (including Indonesia) introduced a number of regulations intended to improve corporate governance practices of listed companies in the region. The World Bank assessments on corporate governance mechanism at the country level in the region indicate significant improvements in the past decade¹. As suggested by Wei and Zhang (2008), future research needs to examine if the improvement in the quality of corporate governance (henceforth, CG) mechanisms alone has changed the investment behaviors of East Asian companies.

Based on the above explanation, our study aims to examine if in Indonesia there still exists a positive relation between investment and cash flow. We also examine if in Indonesia overinvestment still dominates after a number of CG improvement initiatives were introduced.

Other stream of studies examine the relation between over or underinvestment problem and the level investment opportunities. Hoshi, Kashyap and Schafstein (1991) suggest that firms with good prospect (i.e., high Tobin's Q) tend to have asymmetric information problem while firms with poor prospect (i.e., low Tobin's Q) tend to have agency problem. Degryse and de Jong (2006) then examine if in the Netherland, the positive investment-cash flow sensitivity primarily exists in firms with poor prospect (low Tobin's Q) or firms with good prospect (high Tobin's Q). They find that investment cash-flow sensitivity for firms with low investment opportunities is higher than those with high investment opportunities, suggesting that overinvestment problem tend to dominate underinvestment problem in the Netherland.

We extend Wei and Zhang (2008) and Degryse and Jong (2006) by examining if overinvestments resulting from incentive to expropriate primarily exists in firms with bad prospect. As firm prospect improves, there are abundance of value creating investment opportunities. Given capital constraints, even though controlling shareholders have high incentive to expropriate, they will first take investments with positive NPV and may not take those investments with negative NPV. On the other hand, for firms with bad prospect, there are only few investments with positive NPV, and thus it's more likely for them to invest in projects with negative NPV. Therefore, the positive effect of incentive to expropriate on overinvestment is stronger in firms with bad prospects than those with good prospect.

Indonesian listed firms are selected as the sample of the study for the following reasons. The Indonesian company law (Undang-Undang No. 40 Perseroan Terbatas) requires companies to adopt dual board structure: the Board of Directors that manage the company and the Board of Commissioners (BOC) that oversees the Board of Directors (BOD). The ownership structure of almost all listed companies in Indonesia are highly concentrated and many of them have pyramid ownership structures². Thus, controlling shareholders of majority of the companies effectively determine members of the BOC as well as BOD. Under this setting, an independent oversight of BOC on BOD may be hampered and thus, listed firms may be managed primarily for the interests of controlling shareholders, which along the way may detriment non-controlling shareholders.

One cause of the East Asian financial crisis is poor corporate governance practice in the region and during the East Asian financial crisis, Indonesia was the hardest hit country with the record of minus 13% in GNP growth. After the crisis, a number of rules have been enacted in Indonesia to reduce the opportunity of controlling shareholders to expropriate the wealth of non-controlling shareholders. These rules include, among others, the revision of the company law that provides more protection to shareholders, the requirement of having independent commissioners at least 30% of total commissioners in the Board of Commissioners, the establishment of audit committee whose members are entirely independent, the requirement that conflict of interest transactions are approved by those independent of the transaction, extensive disclosure of related party transactions, etc. These initiatives if effectively enforced suggest that the likelihood of expropriation through overinvestment should decrease after the Asian crisis. On the other hand, enforcement of the rules is still a major problem in Indonesia, as suggested by some surveys³. Further, although Indonesia revised its CG Code in year 2006 to be in line with international best CG practices, the adoption of the code to listed companies is voluntary, making the code may not be effective in improving CG practices of the companies⁴. In addition, as mentioned earlier, until now the divergence between control and cash-flow rights

still prevail in most listed companies in Indonesia and relative to other neighbouring countries, the disclosure of ultimate owners is relatively opaque. Therefore, it is an empirical question to examine if after more than 10 years investment-cash flow sensitivity due to overinvestment still exists, exists only for certain type of firms, or does not exist at all.

Using year 2005 to 2008 as the period of the study and manufacturing firms as the samples of our study, we find that in general there is no significant positive relation between investment and cash flow for listed firms in Indonesia. This finding is in line with Chen and Chen (2012). We document that positive investment-cash flow sensitivity exists for firms whose controlling shareholders have low cash-rights, suggesting that overinvestment problem occur for firms whose controlling shareholders have low alignment incentive. When we examine if the relation is affected by the interaction between cash-flow rights/cash-flow leverage and firm prospect, we find that for firms with very low prospect and high risk of expropriation by controlling shareholders, overinvestment is taking place.

Our study extends the study of Wei and Zhang (2008) by showing that the effect of cash-flow right/cash flow leverage on investment-cash flow sensitivity depends on firm prospect. We also extend Degryse and Jong (2006) by demonstrating that investment opportunities have not only a direct effect on investment cash flow sensitivity but also a moderating effect on the relation between expropriation incentive and investment cash flow sensitivity. Further, we document that ten years after the East Asian financial crisis, on average listed firms in Indonesia do not exhibit positive investment-cash flow sensitivity.

HYPOTHESES DEVELOPMENT

The following section elaborates hypotheses to be tested. The first hypothesis examines if there is a positive relation between investment and cash flow among listed firms in Indonesia. The second and third hypotheses identify whether either underinvestment or overinvestment primarily explains the positive investment cash flow sensitivity. The identification is by examining the effect of expropriation incentive on the investment cash flow sensitivity. The fourth hypothesis tests if investment cash flow sensitivity is more positive in firms with low investment opportunities than in firms with high investment opportunities firms. If it does, it indicates that overinvestment is still a major problem in Indonesia. The fifth hypothesis, which reflects the main contribution of the study, examines if the effect of expropriation incentive on the investment cash flow sensitivity depends on investment opportunities.

Background

Existing studies suggest that the positive relationship between cash flow and investment can be explained based on two arguments, i.e., agency problems resulting in overinvestment or asymmetric information problem resulting in underinvestment. The following two paragraphs explain the arguments for the relationships.

Jensen (1986) and Stulz (1990) show the agency problem in capital budgeting where firms with more cash flow will make more investment than firms with lower cash holdings. Further, Taggart (1987), Brealey and Myers (2000), and Harris and Raviv (1996; 1998) also find that managers tend to entrench themselves through increasing firm size and more assets under their control. Wei and Zhang (2008) also show that overinvestment due to the agency problem is not only caused by the conflict between shareholders and managers but also by the conflict between controlling and non-controlling shareholders. Thus, the capital budgeting decision made by managers and/or controlling shareholders may not intend to maximise the firm value.

At the same time, Fazzari et al. (1988); Hoshi et al. (1991); and Hubbard (1998) assert that the existence of information-driven capital market imperfections impede the external financing through the capital market because the cost of capital is expensive. If the capital market is perfect, internal cash flow of the firm should not be related to corporate fixed investment. Consequently, the “most constrained” firms are more sensitive to internal cash flow in financing their investment expenditure than “less constrained” firms. Wei and Zhang (2008) also corroborate that the financial constraint caused by the imperfection of capital market induce the firm to rely on internal financing and may pass up a value-maximising project or underinvestment. Therefore, there is a positive relationship between a firm cash flow and investment.

As explained in the previous part, in the past 15 years, a significant number of rules have been enacted to improve corporate governance practice in Indonesia, including to reduce the likelihood of wealth expropriation of non-controlling shareholders. In year 2000, the Capital Market Regulator requires that material conflict of interest transactions have to be approved by independent shareholders at the General Meeting of Shareholders. In addition, in year 2008 companies have to publicly announce material related party transactions. Both regulations require publication of the opinion of independent valuers regarding the fairness of the transactions and the statement by Board of Commissioners and Board of Directors that no misstatement in the disclosures of the announcement. Extensive disclosures regarding related party transactions also have to be provided in the notes to financial statements, such as the value, nature and the

counter party of the transactions as well as the statement if the transactions are conducted at arm's length.

In addition to the regulator, non-governmental organisations (NGOs) also conduct advocacies and education to promote good governance practices among listed companies in Indonesia. For example, National Committee on Governance Policy which was established after the economic crisis in 1998 is in charge for producing codes of corporate governance for companies in general and also codes for various sectors in the economy. The Indonesian Institute for Corporate Directorship was established in year 2001 and its activities are providing corporate governance and directorship and corporate governance training to commissioners and directors and conducting research on corporate governance practices in Indonesia. Annually it conducts assessment of corporate governance practices of listed companies and the results are provided to the Capital Market Regulators as feedback for improving corporate governance practices of listed companies.

Hypothesis 1

As explained earlier, both financing constraints which result in underinvestment problem and agency conflicts which give rise to overinvestment problem bring about a positive investment-cash flow sensitivity. The implication is that if financing constraints become less pronounced and/or agency conflicts can be mitigated by better oversight by the regulator then the positive investment-cash flow sensitivity may decline.

As explained above, after the East Asian crisis, the capital market regulator has enacted a number of rules aiming to improve corporate governance practices of listed companies in Indonesia. As a result of these initiatives, as assessed by the World Bank (2010), the average corporate governance score of Indonesia in year 2009 improves significantly relative to the score in year 2004. The assesment primarily focuses on the quality of regulation; while the enforcement of the rules remains a challenge in Indonesia. The capital market regulator has also enacted a number of regulations to reduce market imperfection and asymmetric information in the capital market. As a consequence, the trading value of stocks jumped by almost 9 times between year 2000 to 2008.

Chen and Chen (2012) provide an alternative explanation on the possible no relation between investments and cash flow. They argue that the positive relation between cash flow and investments found in the previous studies may be due to the fact that current cash flow is reflecting future profitability while the level of investment is an increasing function of future profitability. Over time, as a result of an increasing importance of research and development (R&D)

activities and intangible assets in determining future profitability, current cash flow is becoming less correlated with future profitability and as a result no positive relation between investment and cash flow is observed. They find however that this explanation cannot totally explain the disappearance of positive investment-cash flow sensitivity in the U.S.

R&D activities are not yet playing major roles in creating value for manufacturing firms in Indonesia since many of the firms are still relying on imported technologies of the production process⁵. We expect that the increasing role of R&D activities is not as strong as that in the U.S. and thus its impact on investment-cash flow sensitivity should not be substantial.

In conclusion, initiatives to improve corporate governance practice and to reduce capital market imperfection as well as the increasing role of R&D activities should reduce the investment-cash flow sensitivity; however, relatively weak enforcement of the rules and insubstantial role of R&D expenditures in Indonesia imply that positive investment-cash flow sensitivity still exists. Based on above explanation, we offer no prediction with the direction of the hypothesis and thus we posit the following alternative form of hypothesis as follows:

H1: There is a positive relation between the level of investments and cash flow.

Hypothesis 2

Goergen and Renneboog (2001) investigate the effect of ownership structure on investment-cash flow sensitivity. Using large outside shareholders, institutional shareholders, and insider ownership as a proxy of the ownership structure, they test how the ownership structure may align the interest of managers and other shareholders and also the suboptimal investment (i.e., overinvestment or underinvestment) can be reduced. Their results show that the presence of large outside shareholders reduce the investment-cash flow sensitivity because they monitor the manager from expropriating the firm's free cash flow and reduce the asymmetric information between managers and other shareholders.

Their findings apply to the firms with dispersed ownership meanwhile in Indonesia, the ownership structure is characterised by concentrated ownership so the primary agency problems is not between managers and shareholders but between controlling shareholders and non-controlling shareholders. In fact, the existence of large shareholders at some point may raise another problems where they tend to expropriate the minority shareholders to reap the private benefit. This argument is also addressed by Goergen and Renneboog (2001) who find the

positive relationship between cash flow and investment spending when large share stakes are controlled by industrial companies.

Wei and Zhang (2008) focus on the agency problems between the controlling shareholders and non-controlling shareholders and how the ownership structure affects the investment-cash flow sensitivity. Wei and Zhang (2008) use cash flow-rights and control rights of controlling shareholders suggested by Claessens, Djankov, Fan and Lang (2002) to indicate the alignment and expropriation or entrenchment effect of the presence of controlling shareholders. The alignment between controlling shareholders' interest and non-controlling shareholders' interest increases as cash-flow rights of controlling shareholders get higher. As a result, overinvestment tends to decrease. On the other hand, the higher level of divergence between control rights and cash-flow rights of controlling shareholders increases the entrenchment motive of controlling shareholders toward noncontrolling shareholders. As a consequence, overinvestment problem becomes more exacerbated. Therefore, as in Wei and Zhang (2008) we state hypothesis related to the effect of ownership structure on the overinvestment problems as follows.

H2: As a manifestation of overinvestment, the positive investment-cash flow sensitivity decreases as cash-flow rights increase and as the divergence between control rights and cash-flow rights decreases.

Hypothesis 3

Based on Myers and Majluf (1984), Hadlock (1998) suggests and find that under asymmetric information problems in the capital market, managers who have strong incentive to maximise shareholder wealth tend to underinvest, which is reflected in positive investment cash-flow sensitivity. Based on their studies, Wei and Zhang (2008) suggest that underinvestment becomes more of a problem when the cash-flow rights of controlling shareholders is high or as the divergence between control rights and cash-flow rights is low. Higher cash-flow rights signify higher incentive of controlling shareholders to maximise firm value (i.e., their incentives are more aligned with non-controlling shareholders) and lower divergence between control and cash-flow rights results in less incentive for controlling shareholders to expropriate wealth of non-controlling shareholders. Under the condition of asymmetric information problems, this results in a more positive investment cash-flow sensitivity.

Asymmetric information problems in the Indonesian capital and financial markets still persist even though some initiatives have been taken by the capital regulator to improve the transparency of the markets. The initiatives among

others are the mandatory requirement for public companies to have audit committee and more disclosure requirements in the annual report public companies in year 2006. Despite these initiatives, however, in term of corporate disclosure, in general the disclosures of public companies in Indonesia are still lower than those of Indonesia's neighbouring countries⁶. The existence of asymmetric information eventually is reflected in the relatively high external cost of funds of Indonesian companies⁷. Under this condition, value maximising controlling shareholders prefer to utilise internal funds which is mirrored in the positive relation between the level of investment and internal cash-flow generated by the firms. Thus, as in Wei and Zhang (2008), the testable hypothesis is as follows.

H3: As a manifestation of underinvestment, the positive investment-cash flow sensitivity increases as cash-flow rights increase and as the divergence between control rights and cash-flow rights decrease.

Note that the first and the second hypotheses result in different prediction regarding the effect of ownership structure on investment cash-flow sensitivity. Thus, the empirical test for the the hypotheses will reveal which problem (agency problem or assymetric information problem) is more dominant among publicly listed firms in Indonesia.

Hypothesis 4

Hayashi (1982), Vogt (1994), and Degryse and Jong (2006) find that the investment-cash flow sensitivity depend on the investment opportunities. Degryse and Jong (2006) argue that overinvestment exists in firms with bad prospects. The divergence of objectives between managers and shareholders cause the managers overinvest in negative present value projects to increase firm size even though it may jeopardise the shareholders' wealth. This argument corroborates the agency problem of free cash flow hypothesis or managerial discretion problem theory as stated by Jensen (1986). Further, Degryse and Jong (2006) also support Myers and Majluf (1986) who argue that the asymmetric information between insiders (managers) and outside shareholders impede the firms to get the external financing and cause the underinvestment in firms with high growth or investment opportunities. Degryse and Jong (2006) find that firms with low investment opportunities have higher investment cash flow sensitivity than those with high investment opportunities, suggesting that overinvestment problem dominates the underinvestment problem.

We expect the findings of Degryse and Jong (2006) are also aplicable to Indonesia. A number of studies in Indonesia (Kim, 2008; Utama & Handy, 2011;

Utama & Utama, 2014) find that publicly listed firms with high investment opportunities as proxied by the ratio of stock price to book value of equity per share tend to be better governed than those with low investment opportunities. Using listed firms in emerging markets as their samples, Francis, Hasan and Song (2013) find that better governed firms face less financing constraints than poorly governed firms. Thus, the asymmetric information problems for firms with high investment opportunities are reduced by practicing better corporate governance. Utama and Utama (2014) also find that firms with low investment opportunities are significantly less profitable than those with high investment opportunities, indicating a more severe agency problem for the low investment opportunities firms. Practicing good corporate governance can reduce the negative impact of agency problem on firm performance (Utama & Handy, 2011; Utama & Musa, 2011). However, since low investment opportunities firms are poorly governed, the agency problem faced by these firms are not reduced by their governance practice. Thus, in combination, we expect that in Indonesia, overinvestment problem dominates underinvestment problem. Based on the above explanation, we posit the following hypothesis:

H4: Investment cash flow sensitivity is more positive in low investment opportunity firms than in high investment opportunity firms.

Hypothesis 5

Hypothesis two and three provide the impact of expropriation incentive and asymmetric information problems on investment cash flow sensitivity regardless the level of investment opportunities, while hypothesis four explains the impact of investment opportunities on investment cash-flow sensitivity regardless the expropriation incentive. We posit that as the level of investment opportunities gets higher, the impact of incentive expropriation (asymmetric information) on investment cash flow sensitivity gets lower (higher). The argument is as follows.

To maximise firm value, a manager should take all investments with positive net present value (NPV) while reject those with negative present value. Investments with positive NPVs increase the wealth of controlling shareholders and thus this rule applies regardless of the controlling shareholder's incentive to expropriate the wealth of non-controlling shareholders. On the other hand, controlling shareholders with high incentive to expropriate may take investments with negative NPVs if these investments enable them to expropriate non-controlling shareholders and as such increases their wealth.

Firms have varying degree of investment opportunities (i.e., investments with positive NPV) and due to financial market imperfection, they face capital

constraints. For firms with good prospect, there are abundances of value creating investment opportunities that will increase controlling shareholders' wealth and given capital constraints, investments with the highest NPV will be taken first before those with lower NPVs. This condition reduces their need to expropriate non-controlling shareholders by taking value destroying investments. As a result, even though controlling shareholders have high incentive to expropriate, they will be less likely to take those investments with negative NPV (i.e., less overinvestment). On the other hand, for firms with bad prospect, there are only few investments with positive NPV, and thus it's more likely for them to invest in projects with negative NPV. Therefore, the positive effect of incentive to expropriate on overinvestment is stronger in firms with bad prospects than those with good prospect.

This line of reasoning is consistent with the study of Bae, Baek, Kang and Liu (2012). They examine how expropriation incentive of controlling shareholders affect firm value during economic crisis and the subsequent recovery periods. They argue that during the economic crisis, because of poorer investment opportunities, controlling shareholders have stronger incentives to expropriate their firms for their own benefits. As the economy recovers, investment opportunities significantly improve. This improvement reduces controlling shareholders' incentive to expropriate non-controlling shareholders. In line with the argument, they find that firms that are subject to controlling shareholders' high expropriation incentives experience more decline in their value during crisis but perform better during the recovery period.

As explained earlier, Indonesian capital markets are far from perfect due to asymmetric information problem while at the same time the ownership structures of most listed companies are concentrated with large divergence of control rights over cash-flow rights. We posit that the combination of these two conditions aggravates the impact of the interaction between ownership structure and investment opportunities on the investment cash-flow sensitivity. Based on the above argument, we formulate the following hypothesis:

H5: As investment opportunities improve, the effects of cash-flow rights and the divergence between control rights and cash-flow rights on the positive investment-cash flow sensitivity weaken.

RESEARCH DESIGN

Sample

We restrict our samples to include only manufacturing firms because of these reasons, first, to control for the industry effect on variation in the level of investments, second, the variables used in this study (capital expenditures measured as change in net fixed assets, working capital, assets turnover) are primarily more suitable for manufacturing firms.

Our main variables are cash-flow rights and control rights, and thus to be included in the sample, data on those variables should be available. In Indonesia, only shareholders with direct ownership of more than five percent are publicly disclosed while in fact majority of controlling shareholders indirectly own listed companies through layers of company ownerships. Thus, to obtain the indirect ownership data for each company, one needs to hand collect them one by one in the Ministry of Justice. Many listed companies are owned by entities domiciled overseas and since the Ministry of Justice has ownership data only on companies domiciled in Indonesia, a large number of Indonesian listed companies whose owners are domiciled overseas have to be removed from the sample. Data on cash flow rights and control rights are obtained from Diyanti, Utama, Rossieta and Veronica (2010) and both measures are computed in according to Claessens et al. (2000). Diyanti et al. (2010) limit her samples to manufacturing firms that have data on cash-flow and control rights. Out of about 130 manufacturing listed firms in the Indonesian stock exchange, Diyanti et al. (2010) have complete ownership data on 98 firms or 294 firm-years during year 2005 through 2007. To increase the number of samples of our study, we extend the period to year 2008. Given that the ownership data is only until year 2007, we assume the ownership of listed firms in year 2008 is the same as in year 2007⁸. With the addition of firms from year 2008, we employ 392 firm-years as the initial samples of our study.

To be included in final sample, the data must meet these criteria:

1. Firms must be listed in the Indonesian Stock Exchange (ISE)
2. Firms must report audited financial statements annually from 2005 to 2008
3. Firms must not have a negative book value of equity (henceforth, BE)
4. Firms have all data required for variables employed by this study

Many firms have negative book value of equity and missing values on variables such as capital expenditure, working capital, assets, and sales and

consequently they need to be dropped. This results in final sample of 284 firm-years from 78 corporations over the period of 2005–2008.

We identify some outliers in some variables (the level of investments, change in working capital, price to book value and the ratio of cash flow to total assets). Rather than deleting them and losing some observations, we winsorize the values of the outliers to be the same as the highest/lowest values of observations not considered as outliers.

Data for all variables other than ownership structure are obtained from OSIRIS database.

Empirical Model and Measurement of Variables

We employ the following empirical model to examine the existence of positive investment-cash flow sensitivity in our samples:

$$\frac{I_{it}}{K_{i,t-1}} = \beta_0 + \beta_1 PBV_{i,t-1} + \beta_2 \frac{CF_{it}}{K_{i,t-1}} + \beta_3 \frac{\Delta NWC_{it}}{TA_{i,t-1}} + \beta_4 \frac{Sales_{it}}{TA_{i,t-1}} + \beta_5 \frac{Debt_{it}}{TA_{i,t-1}} + e_{it} \quad (1)$$

where I_{it} , and CF_{it} represent investment (the difference between net property, plant and equipment plus other fixed assets at the end of the year t minus previous year of net property plant and equipment plus other fixed assets) and cash flow from operating activities during period t , respectively; $K_{i,t-1}$ is the amount of fixed capital at the beginning of period t .

Control variables are: As a proxy for investment opportunities we use $PBV_{i,t-1}$ which is the ratio of stock price to book value of equity, calculated at the beginning of period t . Following Degryse and de Jong (2006), we employ two control variables: the change in net working capital and total sales, both scaled by total assets at the beginning period. Whited (1992) provides evidence that financially distressed firms have difficulties to obtain outside finance and this hampers their real investment expenditures. We measure debt ratio (total liabilities to total assets) as a measure of financial distress.

The first hypothesis states a positive relation between cash flow and level of investment if there is under/overinvestment problem. Therefore, we expect the coefficient of Cash Flow (i.e., β_2) to be positive.

To investigate the impact of the ownership structure on the investment-cash flow sensitivity (Hypothesis 2 and 3), we use the following empirical model:

$$\frac{I_{it}}{K_{i,t-1}} = \beta_0 + \beta_1 PBV_{i,t-1} + \beta_2 \frac{CF_{it}}{K_{i,t-1}} \beta_3 \frac{CF_{it}}{K_{i,t-1}} \times CFR_{i,t-1} + \beta_4 \frac{CF_{it}}{K_{i,t-1}} \times CFL_{i,t-1} + \beta_5 \frac{DeltaNWC_{it}}{TA_{i,t-1}} + \beta_6 \frac{Sales_{it}}{TA_{i,t-1}} + \beta_7 \frac{Debt_{it}}{TA_{i,t-1}} + e_{it} \quad (2)$$

where $CFR_{i,t-1}$ is cash flow rights, i.e. controlling shareholders' cash flow rights and $CFL_{i,t-1}$ is cash flow leverage which is the difference between the controlling shareholders' control rights and cash flow rights. Other variables are defined in Equation (1).

If overinvestment resulting from agency problem has relatively stronger effect than underinvestment, then β_3 will be negative and β_4 will be positive, while if underinvestment problem dominates, β_3 will be positive and β_4 will be negative.

To examine the impact of investment opportunities on the investment-cash flow sensitivity (hypothesis 4), the following model is employed:

$$\frac{I_{it}}{K_{i,t-1}} = \beta_0 + \beta_1 PBV_{i,t-1} + \beta_2 \frac{CF_{it}}{K_{i,t-1}} + \beta_3 \frac{CF_{it}}{K_{i,t-1}} \times PBV_{i,t-1} + \beta_4 \frac{DeltaNWC_{it}}{TA_{i,t-1}} + \beta_5 \frac{Sales_{it}}{TA_{i,t-1}} + \beta_6 \frac{Debt_{it}}{TA_{i,t-1}} + e_{it} \quad (3)$$

where all variables are explained in Equations (1) and (2).

Hypothesis 4 states that investment cash flow sensitivity is more positive in low investment opportunity firms (low PBV) than in high investment opportunity firms (high PBV). Based on the hypothesis, if overinvestment problem in low PBV firms dominates underinvestment problem in high PBV firms, then β_3 will be negative.

To investigate the moderating effect of investment opportunities on the impact of ownership structure on investment-cash-flow sensitivity, we use the following empirical model:

$$\begin{aligned} \frac{I_{it}}{K_{i,t-1}} = & \beta_0 + \beta_1 PBV_{i,t-1} + \beta_2 \frac{CF_{it}}{K_{i,t-1}} + \beta_3 \frac{CF_{it}}{K_{i,t-1}} \times CFR_{i,t-1} + \beta_4 \frac{CF_{it}}{K_{i,t-1}} \times CFL_{i,t-1} \\ & + \beta_5 \frac{CF_{it}}{K_{i,t-1}} \times CFR_{i,t-1} \times PBV_{i,t-1} + \beta_6 \frac{CF_{it}}{K_{i,t-1}} \times CPL_{i,t-1} \times PBV_{i,t-1} \\ & + \beta_7 \frac{DeltaNWC_{it}}{TA_{i,t-1}} + \beta_8 \frac{Sales_{it}}{TA_{i,t-1}} + \beta_9 \frac{Debt_{it}}{TA_{i,t-1}} + e_{it} \end{aligned} \quad (4)$$

where all variables are explained in Equations (1) and (2).

Hypothesis 5 states that higher investment opportunities weaken the effects of cash-flow rights and the divergence between control rights and cash-flow rights on the positive investment-cash flow sensitivity. According to hypothesis 5, β_5 is positive while β_6 is negative.

Equation (4) involves a lot of interaction variables and this usually causes multicollinearity problem which usually makes the coefficients of the regressors inefficient. To check if multicollinearity problem exist, we calculate Variance Inflation Factors (VIF) for each regressor. In general, if VIF is more than 15, then multicollinearity problem exists. To addresss the problem, the variable causing multicollinearity needs to be removed from the equation.

Since we employ panel data, for each empirical model, we conduct tests to determine whether the ordinary least squares (OLS), the fixed effect method (FEM), or the random effect method (REM) is the most appropriate method to use. To test if REM or FEM is better method to use, we employ the redundant fixed effect likelihood test. The test is also employed to determine if FEM covers both period and cross-section, cross-section only, or period only. To test if FEM or REM more appropriate, we use Haussman test.

EMPIRICAL RESULTS

Descriptive Statistics

Table 1 provides the descriptive statistics of variables employed in the study. As shown by standard deviation, maximum and minimum values, the variations of the level of investments (INVTA), cash flow (CFTA), price to book value (PBV), assets turnover (SALESTA), financial leverage (DEBTRATIO), and change in net working capital are quite large, indicating that the samples are highly varied.

The average cash flow rights (CFR) is 46.0%. Less than 20% of controlling shareholders have cash flow rights less than 20% while more than 43% of them have cash flow rights more than 50%. The figures indicate that the ownership structure of listed companies in the sample firms is highly concentrated. The average cash flow leverage (CFL = the difference between control rights and cash flow rights) is 11.3%. Slightly more than 50% of the firms have cash flow leverage greater than zero. Thus, the use of pyramid structure is still common, as evidenced by the majority of firms have control rights exceeding cash flow rights.

Table 1
Descriptive statistics of the variables (n = 284)

Variable	Average	Standard Deviation	Maximum	Minimum
INVTA	0.022	0.126	0.741	-0.877
PBV	1.938	3.517	21.767	0.082
CFTA	0.070	0.130	0.668	-0.350
SALESTA	1.269	1.324	15.887	0.024
DELTAWCTA	0.195	0.271	0.856	-0.682
DEBRATIO	0.570	0.316	3.398	0.055
CR	0.573	0.251	1.000	0.095
CFR	0.460	0.248	0.971	0.042
CFL	0.113	0.176	0.778	0.000

Correlation Analysis

Table 2 provides the coefficients of Pearson correlations among the variables. Contrary to the expectation, the correlation between cash flow and investments is not significant. Consistent with expectation, PBV which proxies for investment opportunities has a significant positive correlation with the level of investment (loginvta) and the level of cash flow (CFTA). In addition, cash flow rights have a positive relation with PBV while cash flow leverage have a negative relation with PBV. These results are also consistent with the view that higher cash flow rights associate with a stronger alignment effect while higher cash flow leverage associate with a stronger entrenchment effect (i.e., more incentive to expropriate).

Table 2
Pearson correlations coefficients among variables

	INVTA	PBV	CFTA	SALESTA	DELTANWC	DEBRATIO	CR	CFR
PBV	0.156**							
CFTA	0.040	0.225**						
SALESTA	0.030	0.081	0.003					
DELTANWC	0.054	-0.201**	0.154**	0.161**				
DEBRATIO	-0.221**	0.051	-0.262**	0.059	-0.0638**			
CR	0.005	0.170**	0.114	-0.090	-0.250**	0.072		
CFR	0.033	0.276**	0.284**	0.039	-0.069	0.018	0.753**	
CFL	-0.038	-0.148*	-0.238**	-0.0183**	-0.260**	0.077	0.367**	-0.336**

Significant coefficients are indicated by * (10% level), ** (5% level), *** (1% level).

INVTA = Investments per total assets, PBV = Stock Price to Book Value of Equity per share, CFTA = Cash flow per total assets, SALESTA = Sales per total assets, DELTANWCTA = Change in net working capital per total assets, DEBRATIO = Liabilities per total assets.

Regression Analysis

The results of redundant fixed effect tests and Hausman tests consistently conclude that the most suitable method to use is the cross-section fixed effect method. Thus the results provided in the following tables are based on that method.

Table 3 provides the results of the regression test that examines if positive investment-cash flow sensitivity exists during the period of the study (2005–2008). Table 3 shows that the coefficient of cash flow (CFTA) is not significantly positive, meaning that there is no evidence of positive investment-cash flow sensitivity for the sample firms. This result is consistent with the finding of Chen and Chen (2012) who document no positive association between cash flow and investment during the similar period as our study (year 2005–2008). They attribute the result is due to the weakening of information content of cash flow in reflecting future cash flow. They prove this by showing that the correlation coefficient between cash flow and Tobin's Q that is measured similarly with our measure (PBV) has declined in the past 50 years. In 1970s the coefficient correlation was around 0.40 while in 2000s it was only around 0.15. As shown in Table 2, the coefficient correlation between cash flow and PBV is 0.225, which is slightly higher than the correlation found by Chen and Chen (2012) but it is much lower than 0.40. Therefore, our finding of no positive relation between investment and cash flow may also be attributed to low information content of current cash flow reflecting future cash flow.

Table 3
Regression results of investment-cash flow sensitivity

Variable	Expected Sign	Coefficient	t-statistic
Intercept		0.130	3.757
CFTA	+	-0.116	-1.429
PBV	+	0.023***	4.584
SALESTA	+	0.001	0.124
DELTANWCTA	+	0.079*	1.289
DEBTRATIO	-	-0.282***	-7.046
N	284		
Adjusted R-squared	0.333		
F-statistic	2.768***		

Significant coefficients are indicated by * (10% level), ** (5% level), *** (1% level).

INVTA = Investments per total assets, PBV = Stock Price to Book Value of Equity per share, CFTA = Cash flow per total assets, SALESTA = Sales per total assets, DELTANWCTA = Change in net working capital per total assets, DEBTRATIO = Liabilities per total assets.

An alternative possible explanation is that in general agency problem and asymmetric problem have decreased so there is no positive association between investment and cash flow. As explained above, the decrease may be due to a number of initiatives that have been taken by the capital regulator to improve corporate governance practices of listed companies and to reduce capital market imperfections since the Asian financial crisis in the late 1990s.

Except for SALESTA, all other control variables are significant in the expected direction. PBV, which signifies investment opportunities, has a positive effect on the level of investments. This indicates that firms with abundant investment opportunities invest more than those with poor investment opportunities. Change in net working capital (DELTANWCTA) has a marginally positive relation with the level of investments, suggesting the need of both working capital and fixed assets concurrently. The level of debt (DEBTRATIO) has a strong negative relation with the level of investments, indicating that firms with too much debt have lower level of investments.

The second and third hypotheses examine the effect of cash flow rights and cash flow leverage on investment-cash flow sensitivity. If higher cash flow rights (cash flow leverage) lower (increases) the sensitivity, then these indicate that overinvestment problem tends to dominate underinvestment problem and vice versa. Wei and Zhang (2008) find evidence consistent with overinvestment problem during pre-financial crisis period in East Asia. Table 4 provides the results of testing the hypotheses.

Table 4
Results of regression of ownership structure on investment-cash flow sensitivity

Variable	Expected sign	Coefficient	t-statistic
C		0.133	3.881
CFTA	+	0.339**	1.746
PBV	+	0.023***	4.719
SALESTA	+	0.002	0.193
DELTANWCTA	+	0.082*	1.323
DEBTRATIO	-	-0.283***	-7.149
CFR*CFTA	-/+	-0.851***	-2.589
CFL*CFTA	-/+	-0.543	-0.874
N	284		
Adjusted R-squared	0.349		
F-statistic	2.848***		

Significant coefficients are indicated by * (10% level), ** (5% level), *** (1% level).

INVTA = Investments per total assets, PBV = Stock Price to Book Value of Equity per share, CFTA = Cash flow per total assets, SALESTA = Sales per total assets, DELTANWCTA = Change in net working capital per total assets, DEBTRATIO = Liabilities per total assets.

The coefficient of cash flow (CFTA) becomes positive and the coefficient of interaction between cash flow and cash flow rights (CFTA*CFR) is significantly negative; while the coefficient of interaction between cash flow and cash flow leverage (CFTA*CFL) is not significantly positive. Higher cash flow rights signify that the interests of controlling shareholders are more aligned with other shareholders and this alignment reduces the overinvestment problem. Based on the coefficients of CFTA and CFTA*CFR, we can calculate the coefficient of cash flow as a function of cash flow rights. Based on the calculation, we find that overinvestment problem tends to exist when cash flow rights of controlling shareholders are very low (less than 15%).

The results provide a weak support of the findings of Wei and Zhang (2008) that relative to underinvestment problem, overinvestment problem tends to be more of a problem in Indonesia. The possible explanation for the weak finding is that the enactment of a number of rules aiming at protecting the interests of non-controlling shareholders after the economic crisis in year 1998 reduces the agency problem, i.e., it is more difficult for managers or controlling shareholders to expropriate wealth of non-controlling shareholders through among others overinvesting activities. Another possible explanation is that the counter effect of the asymmetric information problem (explained in hypothesis two) may partially offset the impact of the entrenchment effect on investment cash-flow sensitivity.

The weak support also indicates that the existence of incentive to expropriate firms' wealth may not necessarily result in overinvestment problem. This explanation is further investigated in the last empirical test.

Next, we examine the impact of investment opportunities (as reflected in the ratio of Price to Book Value of Equity (PBV)) on the investment – cash flow sensitivity. As explained in the hypothesis development, if a higher PBV reduces the investment cash flow sensitivity, then overinvestment problem is the dominant problem in Indonesia.

The results of the test is shown in Table 5. The coefficient of interaction between cash flow and PBV is marginally negative, suggesting that firms with high investment opportunities have lower investment cash flow sensitivity than those with lower investment opportunities. Since firms with low investment opportunities tend to have overinvestment problem, this finding is consistent with the finding of previous test, i.e., overinvestment tends to dominate the underinvestment problem in Indonesia.

The next test is to test Hypothesis 5, i.e., whether the interaction between investment opportunities and ownership structure has a significant impact on

investment-cash flow sensitivity. According to the hypothesis, overinvestment problem primarily exists in firms with low investment opportunities and whose controlling shareholders have strong incentive to expropriate firms' wealth.

When we run the full model (Equation 4) and test the existence of multicollinearity problem, we find that the VIFs for all variables (except for control variables) are greater than 15. The VIFs for the three way interactions variables are more 400, indicating the occurrence of a severe multicollinearity problem. To overcome this problem we need to remove variables causing multicollinearity. We remove Cash Flow (CFTA) and the VIFs drop to below 15.

Table 5
Regression results of investment opportunities on investment- cash flow sensitivity

Variable	Expected Sign	Coefficient	t-Statistic
C		0.124	3.563
CFTA		-0.062	-0.679
PBV	+	0.027***	4.607
SALESTA	+	0.001	0.108
DELTANWCTA	+	0.089*	1.446
DEBRATIO	+	-0.282***	-7.059
PBV*CFTA	-	-0.031*	-1.305
N	284		
Adjusted R-squared	0.336		
F-statistic	2.765***		

Significant coefficients are indicated by * (10% level), ** (5% level), *** (1% level).

INVTA = Investments per total assets, PBV = Stock Price to Book Value of Equity per share, CFTA = Cash flow per total assets, SALESTA = Sales per total assets, DELTANWCTA = Change in net working capital per total assets, DEBRATIO = Liabilities per total assets.

Table 6 provides the results of the regression to test hypothesis five using the full model and the model after removing CFTA. The coefficient of two way interaction between cash flow and cash flow right (CFTA*CFR) is significantly negative in both model while the coefficient of the three way interaction between cash flow, cash flow right, and PBV (CFTA*CFL*PBV) is not significant. The results indicate that the negative impact of cash flow right on investment-cash flow sensitivity is not affected by investment opportunities. Thus, firms whose controlling shareholders have low ownership (i.e., low cash flow rights) tend to overinvest regardless the level of investment opportunities.

The coefficient of two way interaction between cash flow and cash flow leverage (CFTA*CFL) is not significant under the full model while it is marginally positive under the reduced model. The coefficient of the three way interaction between cash flow, cash flow leverage, and PBV (CFTA*CFL*PBV) is significantly negative under both models. The results show that as firms have more investment opportunities (i.e., PBV gets higher), the positive impact of cash

flow leverage on investment-cash flow sensitivity disappears. Thus, in line with our hypothesis, under abundant investment opportunities, firms whose controlling shareholders have high incentive to expropriate tend not to overinvest.

These findings may explain the weak findings of hypothesis two and three. The findings suggest that firms with high incentive to expropriate do not necessarily overinvest. These firms will overinvest only when they have few investment opportunities. The period of our sample covers year 2005 until year 2008 and during this period Indonesia's economy managed to grow almost 6% per year. Under this conducive investment environment, only few companies experience low investment opportunities and as a result, the effect of ownership structure on investment-cash flow sensitivity is relatively weak.

Table 6
Results of the regression of the interaction between ownership structure and investment opportunities on investment cash flow sensitivity

Variable	Expected Sign	Full Model		Model without CFTA	
		Coefficient	t-Statistic	Coefficient	t-Statistic
C		0.121	3.513	0.123	3.592
CFTA	+	0.287*	1.473		
PBV	+	0.026***	4.632	0.027***	4.685
SALESTA	+	0.002	0.157	0.001	0.111
DELTANWCTA	+	0.102**	1.668	0.103***	1.675
DEBTRATIO	-	-0.277***	-7.018	-0.278***	-7.059
CFR*CFTA	-/+	-0.724**	-2.093	-0.284**	-1.621
CFL*CFTA	-/+	0.558	0.696	1.018***	1.377
CFR*CFTA*PBV	-/+	-0.016	-0.555	-0.020	-0.717
CFL*CFTA*PBV	-/+	-0.772**	-2.181	-0.823***	-2.328
N			284		284
Adjusted R-squared			0.358		0.355
F-statistic			2.882***		2.874***

Significant coefficients are indicated by * (10% level), ** (5%), *** (1% level).

INVTA = Investments per total assets, PBV = Stock Price to Book Value of Equity per share, CFTA = Cash flow per total assets, SALESTA = Sales per total assets, DELTANWCTA = Change in net working capital per total assets, DEBTRATIO = Liabilities per total assets.

Our findings extend the study of Wei and Zhang (2010) that find ownership structure (represented by cash flow rights and control rights) affect investment cash flow sensitivity and that overinvestment problem exist for firms whose controlling shareholders have high incentive to expropriate (i.e., low cash

flow right and high cash flow leverage). Our findings show that firms whose controlling shareholders have high incentive to expropriate do not necessarily overinvest, i.e., it depends on the level of investment opportunities: only those firms with high incentive to expropriate and low investment opportunities tend to overinvest. Our study also extends Degryse and de Jong (2006) since we demonstrate that investment opportunities not only have direct effect but also indirect effect (through its interaction with ownership structure) on investment cash flow sensitivity.

CONCLUSION

We examine if after significant capital market reforms in Indonesia, positive investment-cash flow sensitivity still exists for listed companies in Indonesia. We also investigate if the effect of ownership structure on investment-cash flow sensitivity depends on the level of investment opportunities. The ownership structure is reflected by cash flow rights which measure the incentive alignment between controlling and non-controlling shareholders and cash flow leverage, which measure the incentive of controlling shareholders to expropriate firms' wealth.

Using a sample of firms in East Asia before the financial crisis of 1998, Wei and Zhang (2008) find that firms with low cash flow rights and high cash flow leverage tend to overinvest, which represents one form of agency problem. Under the condition of capital constraints, we posit that this effect may not hold for firms with high investment opportunities since controlling shareholders of these firms have less need to expropriate.

We find that there is no positive relation between investment and cash flow, indicating either the existence of low information content of cash flow or that in general over or underinvestment problem is not occurring for manufacturing listed firms in Indonesia. We do find that overinvestment primarily exists for firms whose controlling shareholders have small ownership in the listed firms. Further, in line with the findings of Degryse and Jong (2006), we document that higher investment opportunities reduce investment cash flow sensitivity, suggesting that overinvestment relatively still dominates underinvestment among listed manufacturing companies in Indonesia.

In line with our expectation, we find that higher investment opportunities reduce the effect of expropriation incentive on the level of overinvestment. This result may explain the weak evidence of overinvestment in Indonesia, i.e., under conducive economic environment, a large number of firms have good investment

opportunities, including those having large expropriation incentive, and as a result these firms do not overinvest.

The implications of the study are as follows. Government or investors that want to identify firms with high risk of overinvestment need to look at firms whose controlling shareholders have low ownership or firms with low investment opportunities and whose controlling shareholders have high incentive to expropriate. The internal control mechanism of these firms requires an independent committee that closely reviews and oversees investment activities of the firms while the investment activities should be transparently disclosed.

The followings are some limitations of the study and the avenues for future research: first, our study covers only Indonesia and thus, to assure the external validity of the findings, future studies need to extend it to other countries, for example the countries employed by Wei and Zhang (2008). Second, the number of observations in this study is rather low primarily due to limited data on cash-flow rights and control rights of the controlling shareholders. Many of the firms have to be removed from the sample because the domiciles of the controlling shareholders are overseas, making the tracking of the ultimate owners and their control and cash-flow rights impossible. Therefore, extending the period of the study for the existing observations can increase the number of observations. In addition, the extended period of the study will also cover period during economic slump. During this period investment opportunities are lower, therefore we expect that the effect of expropriation incentive on overinvestment is stronger during this period. Third, we posit that corporate governance reforms in Indonesia in the past ten years may explain the decrease in the level of overinvestments of listed companies in Indonesia; however, our study does not directly include corporate governance practice as one possible mitigating factor of overinvestment. Therefore, we suggest that future research needs to examine if corporate governance mechanism can reduce the level of investment and it may also reduce the effect of expropriation incentive on the level of overinvestments.

NOTES

1. Reports on the results of corporate governance country assessments conducted by the World can be accessed at http://www.worldbank.org/ifa/rosc_cg.html
2. Pyramid ownership structure results in the divergence of control rights over cash flow rights. The average cash-flow or ownership rights of the largest shareholders in our sample firms is 44% while the average control rights is 56%.

3. For example, the results of survey conducted by CLSA (2012) show that corporate governance score in Indonesia ranks the lowest among 12 East Asian countries covered by the survey. One component that contributes to the low score is the lack of enforcement of the rules.
4. The Indonesian Financial Services Authority (FSA) currently is developing a CG Code for publicly listed companies and once it is launched, FSA will impose the Comply or Explain rule on all listed companies (i.e. companies have to publicly state if they fully comply with the code; if some items in the code are not complied with, companies have to provide reason for non-compliance).
5. R&D expenditures for majority of manufacturing listed firms are not disclosed in the notes to financial statements, indicating that the expenditures are relatively small.
6. Based on the corporate governance country assessment by the World Bank (2010), the score of Disclosure and Transparency principle for Indonesia in year 2009 (73) is lower than those of India (84 in year 2004), Malaysia (87 in year 2005), and Thailand (81 in year 2005).
7. According to the World Development Indicators, during year 2005–2008, the average interest rate spread between borrowing and deposit in Indonesia was 5.4% while the figures were 4.6%, 3.9%, and 3.1% for the Philippines, Thailand, and Malaysia respectively.
8. The ownership data from year 2005 to year 2007 reveals that changes in ownership are very rare; therefore, we are quite confidence that ownership data in year 2008 is quite valid.

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