THE CORPORATE RESTRUCTURING STRATEGIES: EMPIRICAL ANALYSIS IN THAI COMPANIES

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An Independent Study
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By

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ABSTRACT

The study investigates the firm's agency effects on the decision to choose restructuring choices by 169 non-financial Thai companies during the years 1997-2007. The sample companies respond to the decline in both operational and financial distress with three main activities: asset, financial, and managerial restructuring. After the impacts of firm's characteristics are examined by using Multivariate Probit model, the market reaction to restructuring strategies is observed. Both asset restructuring and debt restructuring outperform other strategies in increasing the stock return which can be implied the good expectation on the future firm performance.

I. INTRODUCTION

Over the past decade, Asian crisis had spread out starting from Thailand. During 1993-1996, in addition to high consumption level, Thai GDP expanded around 9% per annum. Financial liberalization and attractive interest rate led to massive foreign capital inflow into Thailand causing growth in mainland industrials, production level, and dramatic run-up in asset prices especially property sector. In time of fixed exchange rate regime, Thai companies had high burden in foreign debt. When Thai baht was hit heavily by over speculations, it has been forced to float since 2 July 1997 and devalued by half of its original value. Consequently, huge foreign debt was double when converted into Thai Baht. These severe situations harmed both financial and real economic sectors causing bankruptcy and business shutdown to some companies. In order to survive and restore their health from decline in both operational and financial performances, several companies need to improve their organization in many ways which are relevant to organizational structure, financial, and firm's asset management. Previous studies show the firm's responses to its financial health and performance problem by a plenty of activities.

According to restructuring strategies, they are widely classified into three groups:

1. Asset restructuring
    - 1.1 Asset expansion includes joint venture, merge and acquisition (M&A) and extending more business units.
    - 1.2 Asset reduction or asset downsizing – an integration or closure of some business units, sale out the subsidiary, decreasing capital expenditure or investment, and disposing of non-core operating asset.
2. Financial restructuring
    - 2.1 Debt restructuring – the changing debt structure by either lower interest payment or debt maturity extent.
    - 2.2 Equity-based restructuring – equity issue for rising of fund.

3. Managerial restructuring – replacing the management position, management turnover, or manager resignation.

With reference to Pramotejitti (2005), corporate in Thailand can be simply divided into two characteristics. The first is about the diversified companies that are controlled by large corporation family. Second, the group of diversified companies has large debt. When Thailand encountered the crisis as mention above, these companies faced trouble in both financial position and operation performance. The problems lead to unfulfilled in creditors' and shareholders' satisfaction.

The subprime crisis right now appears in west countries can also affect on Thai economy via international transaction. Because the U.S. and most European countries are the top trading partners of Thailand, a decreasing in world demand will finally affect Thai local companies. The objective of this study to empirically draw concrete restructuring lesson learnt from the economic crisis occurred 10 years ago by investigating the restructuring choices made by firms that used to experience financial and performance problems. It is important to study the impact of firm's characters on choosing strategies and effectiveness of different kinds of restructuring as it can guide firms to make a right decision to conduct restructuring program to address the trouble of both financial and performance decline.

Because the stakeholders' benefits come along with the result of restructuring strategies, the determinants to choosing strategies are based on corporate agency variables: firm's capital structure, managerial ownership, and corporate governance.

In addition to these agency variables, economic condition is considered as a factor that could affect on activities taken. Internal firm uniqueness such as size is included in the analysis as control variable. Note that, firm size depicts the flexibility and internal slack in the firm (Lai and Sudarsanam, 1997; Pramotejitti, 2005).

In a regression analysis, two approaches are applied to estimate the impact of determinants on firm's responses. The first one is using logit model assuming that the decisions to select strategies are independent. In fact, a firm can choose many restructuring activities at the same

time. Then, the second method, multivariate probit model, is also taken into account for capturing dependence among strategies.

After finding out firm's agency impact on selecting certain strategies, the firm's stock price performance is explored. This purpose is to measure an effectiveness and market reaction to restructuring ways. But the limitation for the study is that the companies which had already been delisted and suspended during the scope of time period cannot be taken into an analysis because their price movements are discontinued.

The sampling in this study adopts Altman Z-score computation for screening data. The total sample contains 169 firms during the period of 1997-2007. Restructuring activities for these companies can be obtained from Files 56-1 and company news that posted in SETSMART website.

The empirical results suggest that the firm's agency monitoring factors have effects on the poor firms to choosing the restructuring strategies. However, an interest coverage ratio cannot have any impact on the decision to select strategy choices. Also, The asset reduction strategy is not popular approach for Thai firms unlike those in UK and Korea (Hillier , McColgan, and Werema, 2008; Pattnaik, 2005). The other agency variables such as leverage, management shareholding, and the proportion of outside directors can influence on the restructuring activities. The effective strategies found in this study are asset reduction, debt restructuring, management restructuring and asset expansion. The market reaction reflects in the positive stock return within the same year as asset reduction and debt restructuring having been taken while the asset expansion is received the response in 2 years after strategy introduced.

The remaining of the paper is organized as follows: Section II discusses the restructuring strategies literatures. Section III explains the theoretical framework and hypotheses testing are set up. The data definition and methodology are described in Section IV while the Section V reveals the overall results. Section VI discusses the study conclusion and suggestion for further studies.

II. LITERATURE REVIEW

The issues in corporate restructuring have been interested for many years. Past literatures study the determinants that affect firms on choosing restructuring strategies. In other words, firm's choices of restructuring strategies are subject to lots of factors. From previous studies, there can be distinguished into three groups: asset, financial, and managerial restructurings.

The first group is interested in asset restructuring. There are two types; namely, asset reduction and asset expansion. Pattnaik (2005) takes into account for the determinants for driving Korean firms to undertake asset sales after the financial crisis in 1997. Both firm's characteristics and the corporate governance are considered as influential factors. This study suggests that the more leverage firm is likely to sell its own assets to generate cash flow to repay debt covenants. However, the company with high managerial shareholding has less intention to sell assets, but rather expands its asset size. The result is the same as the research of Hillier, McColgan, and Werema (2008). The latter group concludes that a firm with liquidity problem needs more asset sales. Considering the stock price performance, they suggest that the stock movement is terrific after asset sales announcement. It is on an expectation that firm's performance and financial position will be improve. Besides, Hillier and McColgan (2005) point out a firm's manager tends to expand asset during poor performance while this kind of action is down if firm's governance is strong.

The second group is the story of financial restructuring. It can be separated into two main categories: debt restructuring and equity-based strategies (Sudarsanam and Lai, 2001). Frederikslust, Leermakers, Soedito, and Dalen (2003) conclude that a firm with more leverage tends to issue equity for debt repayment while this activity is negatively related to firm's managerial ownership. However, if a firm has higher outside directors' portion, it prefers to issue equity to raising new funds. This latest result is the same as the working by Hillier and McColgan (2005) who claim that a firm with large weight in outside directors is likely to issue equity. It can be said that when a firm is in trouble, it could be hard to get some new loans but easier to raise of fund in the way of issuing equity. In the case of debt restructuring, Lai and Sudarsanam (1997) found a positive relationship between firm's leverage and debt

restructuring. Sengupta and Faccio (2006) also get the result that a firm with high leverage is resolved from financial problem by debt restructuring. In addition to firm's capital structure, they found that a huge firm size seems to do this kind of strategy because of the debt negotiation power. To observe the impact of taking financial turnaround strategy, Kam, Citron, and Muradoglu (2008) reveal that there is positive relationship between market reaction and debt restructuring process of non-state owned enterprises (NON-SOEs) in China.

Finally, managerial restructuring is becoming more popular in recent years. Managers face disciplinary pressures from both internal and external corporate control mechanisms. For this reason, Denis and Kruse (2000) suggest that when a firm encounters financial distress, it increases the likelihood of management turnover. They found the performance enhancing after firms revise their management teams. Kang and Shivdasani (1997) find the positive impact of blockholder ownership and leverage on management turnover in response to firm's performance shock. Lai and Sudarsanam (1997) reveal the positive relationship between proportion of outside directors and probability of managerial replacement one year after performance decline showing the importance of corporate governance factor. Likewise, given poor performance, Bhagat and Bolton (2008) state that the proportion of independent directors in board of director is related to probability of disciplinary management turnover in the same direction.

In addition to international literatures, Promotejitti (2005) studies the restructuring strategies among non-financial Thai firms. In case of asset restructuring, she finds the positive relation between leverage and probability of asset reduction. This result is similar to other researches. The leverage factor also affects on the probability of debt restructuring and more equity issues. Furthermore, management ownership influences negatively to probability of managerial replacement. The result is also the same as international evidences. Besides, Thai previous study reveals the significant effect of asset expansion on market reaction. However, its result also claim that when a firm size is greater, the market response goes down.

The similar thing between Thai and international literatures is using logistic regression to find the results. However, the methodology used in past studies is based on independent

decision to choose strategies. In practice, these restructuring strategies can be taken at the same time in which the decision to perform one strategy can affect on the decision to choose other strategies. It can be implied that the restructuring strategies are dependent on each other.

Consequently, the Multivariate Probit model is brought to clarify this issue. It is an additional analysis in this study that would be able to fill the gap about dependencies of strategies.

III. THEORETICAL FRAMEWORK

In this section, the restructuring concept and firm's agency factors are discussed. Then, the relation between them will be defined.

3.1 Restructuring strategies when a firm encounters performance problem

Restructuring is a transaction that firm's management undertakes for increasing corporate efficiency, enhancing productivity, strengthen internal liquidity. Any actions have impacts on firm's financial position, capital structure, and management group. This study mainly focuses on three kinds of restructuring: asset, financial, and managerial strategies.

3.1.1 Asset restructuring

The common strategy found in finance literatures refers to the major reconfiguration of the firm's assets. It comprises of asset expansion and asset reduction (Sudarsanam and Lai, 2001).

- Asset expansion

This is the action that wants to extend firm's business lines and enhance the scale of production. A firm would perform expansion to search for an opportunity to gain more benefits and reaching economies of scale for managing cost efficiency.

- Asset reduction or Asset sales

An action is defined as the disposal of non-core business divisions, subsidiaries, or other fixed assets that cannot make further profit. Mostly, poor performance firms execute this way for the purpose of generating cash flow to solve financial distress and it is the cheapest source of funding (Hillier, McColgan, and Werema, 2008).

3.1.2 Financial restructuring

Financial restructuring mostly involves a change in the capital structure of the firm. Financial restructuring here can be separated as two followings.

- Debt restructuring

Debt restructuring refers to a firm changing its debt structure by either increasing or decreasing leverage. In practice, borrowers might make more new loan contracts (increase leverage) or renew debt. Debt restructuring usually means the injection of high

levels of debt to increase the leverage of the company and thereby reduces the likelihood that the firm will be a takeover candidate (Rock and Rock, 1990). On the other hand, a firm decides to negotiate creditors for interest lowering or maturity extent (Sudarsanam and Lai, 2001; Kam, Citron, and Muradoglu, 2008; Yawson, 2008).

- Equity-based strategies

Generally, equity strategies are defined as dividend cuts or omissions and equity issues. Firms mostly accept this solution to maintain liquidity to conserve for debt obligations as well as raising funds in purpose of new investment and increase working capital. Interestingly, with reference to a firm with performance or financial distress, a cutting dividend or dividend omission is normally executed. Therefore, this paper would not pay attention to dividend strategy.

3.1.3 Managerial restructuring

According to early studies, they conclude that when a firm is in distress, one way to respond bad situation is a management removal or turnover (Denis and Kruse, 2000; Yawson, 2008). It is on the believe that a new management can resolve the problem and develop novel strategies for a firm. This strategy pictures the reorganized management structure. It includes the changing in manager position, replacement of top management and directors, a new appointment, and removal.

3.2 Corporate agency variables

Similar to Lai and Sudarsanam (1997), the agency monitoring variables here reflect in three aspects of managerial shareholding, firm's capital structure, and corporate governance. Theoretically, the agency problem originates from the conflict of interest between shareholders (the principal) and agents (the manager).

The management shareholding represents the motivation to work on behave of firm's shareholders. The manager group with larger shareholding could perform aligned to maximizing shareholder value. This factor also implies the management power to control a firm.

The capital structure is the combination of debt and equity. This study mainly focuses on debt structure which refers to the financial leverage. A highly leveraged firm will take any actions to serve debt covenants before solving other firm's problems. It signifies an increase in creditor power when a firm raises fund relying on debt. Using a lot of debt, a firm increases the cost of bankruptcy and this might lead to destroy the shareholders value.

The third factor is about the corporate governance issue. It shows a role of outside directors who act in firm's board of director on behalf of shareholders. The latest represents the equity holders' power to influent a firm decision.

3.2.1 Management shareholding

The subject is taking into account of the management ownership in a firm. Based on their benefits, managers do not want to do anything that reduces what they should get. They are least likely to choose both debt restructuring and issuing equity. Debt restructuring will promote the creditors' role in the company decision leading to the possibility to propose a new management team. Although the equity issue is usually taken place for liquidity fulfillment, the manager ownership will decrease. During poor performance, a firm might be pressured by creditors that require selling assets to pay down debt obligation. However, because of stockholding, this can imply management's control power to make a decision.

There is evidence that corporate refocusing or asset sales strategy can trigger wealth transfer from shareholders to creditors (Renneboog and Szilagyi, 2008). Thus, to protect

shareholders' value, managers with more stockholding prefer to do expansion policy. Likewise, with reference to asset restructuring, Hillier, McColgan, and Werema (2008) suggest that managers avoid disposing of assets because it may signal of low managerial quality. Rather, they tend to make asset expansion. When a firm faces financial and operating problem, the group of management would be questioned in poor performance and possibly being demotion or replaced. However, if the management shareholding is large enough to give them the right and power to control, managers could adopt any other restructuring activities rather than establish new group of management (Promotejitti, 2005). The proxy for managerial shareholding is percentage shareholding in the company by top management and company's directors.

3.2.2 Capital structure

Generally, the capital structure in a firm can be divided into two mainly parts: equity and debt. Managers have to make a decision to allocate sources of fund to firm's investment and operating activities. Definitely, fund flows come from those two sources depending on firm's cost of capital. When a firm has some portion of debt in its capital structure, it is using financial leverage. The more debt financing firm uses in capital structure, the more financial leverage it employs. With comparing to equity, debt financing has less cost due to the reason of tax-deductible and less risk. However, the main drawbacks of debt are the bankruptcy cost[1] and the risk (dispersion) of shareholders' expected returns.[2]

When a firm is collapsed by financial distress facing out poor performance, it needs to survive its organization. Based on firm's capital structure, more leverage the firm finances, the more financial restructuring will be taken. Financial resolution here is separated into two ways. The first one is equity-based strategy which covers equity issue. Distress companies raise equity funds via share issues more than non-distress firms because of the pressure from creditors concerned with the security of their lending (Sudarsanam and Lai, 2001). Another

[1] High leverage makes firms more likely be unable to make interest and principal payments (Megginson and Smart, 2006).
[2] Fundamental principle of financial leverage states that when firms concentrate on debt rather than equity in their capital structure, using debt can increase the level of expected returns to shareholders and also risk of those expected returns (Megginson and Smart, 2006).

method is debt-based strategy which refers to firm's debt restructuring. It is an another type of financial solution. The creditor role has more impact on managerial choice of strategies. The first motivation is debt repayment. Poorly highly leverage firm could be under creditor control because of more strictly monitoring. The firm management tends to negotiate lenders for debt lowering, extent time maturity, and debt haircut. In addition to financial restructuring, a firm solves a performance problem by asset restructuring. During the performance declines, especially high leverage firm, it is forced to sell assets in order to service its debt obligations (Hillier, McColgan, and Werema, 2008). The lender preference is in contrast to an expansion policy by the management factor. Firm's cash flow position could be relieved due to selling assets off for cash generative but this benefit will serve for paying down debt obligations. Even though distress cost would be reduced, the shareholder value might be expropriated. The proxies for firm's debt structure are leverage and interest coverage ratio. The latter represents firm's ability to service debt obligations.

3.2.3 Corporate governance

According to the Committee on Corporate Governance Development, the Stock Exchange of Thailand, the corporate governance is defined as "a set of structure and process of relationships between company's management, the board, and shareholders to enhance competitiveness towards business prosperity and long term shareholder value by taking into consideration the interests of other stakeholders". It provides a framework that defines the rights, votes, and responsibilities of different groups – management, board, controlling shareholders and minority or non-controlling shareholders – within an organization.

Governance is especially critical in imposing discipline and monitoring mechanism to reduce the agency problem (Lai and Sudarsanam, 1997) . The system of corporate governance can be divided into the outsider and insider models (Frederikslust et al., 2003). The outside directors are specified the role of shareholders in monitoring and controlling the management while the inside directors have responsibilities on firm's decision making. In terms of firm's monitoring, the outside (or called independent interchangeably) directors are presented as a

symbol of corporate governance who are the third party acting as professional corporate referees to ensure the company actions consistent with shareholders' goal.

In particular, the independent directors do not involve to the management team and shareholders, and have no business or other relation with the company. Thai regulation describes that outside directors must not hold more than 5% of company's shares. Therefore, it can be implied that outside directors have duties to both monitor management performance and protect shareholders' benefits. In addition, they have to balance other stakeholders' interests simultaneously.

The corporate governance has an influence on the firm decision to take such turnaround strategies. Bhagat and Bolton (2008) propose that, given poor firm performance, board independence has positive correlated with management turnover. This is the same as Lai and Sudarsanam (1997) who suggest that the higher proportion of independent directors is positively associated to the top management turnover. Due to the mechanism to reduce the agency problem, in the time of squeeze, the lenders and shareholders' interests are in attention. The proxy for corporate governance is defined as proportion of outside directors who are not insider executives to total directors.

3.3 Control variables

The past turnaround literatures state that the strategy choices are also affected by non-agency variables. These additional factors are included in the analysis as control variables. Firstly, an economic environment can influence the management decision to improve firm's health. For example, when an economy is in good condition, a firm prefers to expand its operating action rather than reducing its production level. The next one is about firm's size. This factor is unique for each firm and be able to have an impact on selecting strategies. The larger the firm size, the more possibility to increase asset scales. Debt and equity issue would be easier for a bigger firm because of its negotiation ability.

To setting the relation between restructuring strategies and firm's variables, there can be summarized by the table below.

[Table I is here]

3.4 Market reaction

After the impacts of firm's characteristics on the restructuring choices are examined, the market reaction should be observed. The firm stock price performance is the measurement of investor response to strategies taken. All restructuring activities are subjected to increase the firm performance, competitiveness, cash flow, and profitability in order to survive distress companies and continue their operations instead of going shut down (Pramotejitti, 2005).

IV. DATA AND METHODOLOGY

4.1 Data sampling

According to past literatures in turnaround or restructuring strategies, there is a plenty of ways to define firm's distress. Some studies apply accounting ratio such as the ratio of earning before interest and tax to assets (Kang and Shivdasani, 1997; Yawson, 2008). Some use stock return to represent firm's health (Lai and Sudarsanam, 1997; Pramotejitti, 2005, Frederikslust et al., 2003). However, this study would prefer to categorize firm data by applying Altman z-score. Altman (1968) introduce the z-score as a measure of a firm's bankruptcy likelihood. The formula is combined of five accounting ratio which can be written as:

$$Z = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E \quad (1)$$

Where Z = Altman z-score for each company

A = Working capital / Total assets

B = Retained Earnings / Total assets

C = Earning before interest and tax / Total assets

D = Market value of equity / Total liabilities

E = Sales / Total assets

Stating the firm's health by this measurement is similar to Sudarsanam and Lai (2001). That previous study picks up firms with positive z-score in the consecutive two years and negative z-score in the third year. However, firms which do not meet the criteria cannot be included into the sample even they faced negative z-score leading to survivorship bias. The sample might not fully depict restructuring activities. Hence, the selection in this case will be constructed by collecting firms with negative z-score at least one year during the time period. Their restructuring data are detected between years 1997-2007.

4.2 Data definition and measurement

4.2.1 Restructuring strategies

The restructuring strategies can be separated into three groups. Asset restructuring contains asset expansion and reduction. An expansion covers an increase business lines and production level, buying fixed asset, construction of new plants, foundation of new subsidiaries or invest in associated companies, joint venture, and acquisition. Asset reduction means a disposal of non-core business division or other assets that cannot make further profit, a plant shutdown, layoff, and cost reduction.

Financial restructuring refers to debt restructuring and equity issue. Debt restructuring is about a changing firm's debt structure. A poor firm may increase leverage by more borrowing or decrease debt burden by rearrange with creditors for interest lowering and maturity extent (Sudarsanam and Lai, 2001; Kam, Citron and Muradoglu, 2008; Yawson, 2008). Equity issue comprehends a right issue, public offering, and private placement.

The managerial restructuring comprises of a replacement of firm's chief executive officer (CEO) and firm's directors, a resignation, and top management removal.

The measurement for these strategies is coded as a dummy variable which equal to 1 if a firm accepts strategy and 0 otherwise.

4.2.2 Firm's agency and control variables

The agency variables used to explain restructuring strategies are described as three groups based on kinds of firm's stakeholder monitoring. The first group represents creditor power to control a firm. The leverage and interest coverage ratio reflect firm's capital structure and ability to bearing debt covenants. Second, the managerial shareholding could be considered as a management power. The corporate governance shows the importance of shareholder.

The control variables are added in the analysis: economic condition and firm size.

The measurement for firm's agency and control variables are classified as follows:

$$\textit{Leverage} = \frac{\textit{Total debt}}{\textit{Total capital}} \quad (2)$$

$$\textit{Interest coverage ratio} = \frac{\textit{EBIT}}{\textit{Interest payment}} \quad (3)$$

Managerial shareholding = *% shareholding by directors and management* (4)

Corporate governance = *% independent directors to total directors* (5)

$$\textit{GDP growth rate} = \left(\frac{GDP_t}{GDP_{t-1}}\right) - 1 \quad (6)$$

Firm size = *Ln (Market capitalization)* (7)

4.3 Sources of data

- Annual stock returns and GDP (Gross Domestic Product at constant price) are collected from Thomson Datastream
- Accounting data and restructuring information can be observed from company news, company's financial statement, and Form 56-1. All sources of data can be downloaded from SETSMART website provided by the Stock Exchange of Thailand (SET).

4.4 Methodology

To estimate the ways a firm would like to improve itself, the binary response model is applied where the dependent variables have two values: zero and one. The model can address two drawbacks of the linear probability model (LPM). Those problems by using LPM are the extended range of probabilities value (smaller than zero and greater than one) and the partial effect of any explanatory variables is constant (Wooldridge, 2006). Because of the restriction probability value between 0-1, the binary response model [Pr(y=1|X)], the probability could be nonlinear with X (explanatory variable).

The relationship function between strategies' choices and explanatory variables can be written as:

$$\Pr\left[y_{jit}=1 \middle| x_{1it}, x_{2it}, x_{3it}, x_{4it}, x_{5it}, x_{6it,} D_{it} \right] \quad (8)$$

Where

j = 1, 2, 3, 4, 5 (Restructuring strategies)

i = 1, 2, 3, …, 169 (Firms)

t = Annual period 1997-2007

$Pr[y_{jit} = 1 | X_{it}]$ = Conditional probability of each restructuring action taken on the set of explanatory variables

y_{1it} = 1 if firm i choose asset expansion action, 0 otherwise

y_{2it} = 1 if firm i choose asset reduction action, 0 otherwise

y_{3it} = 1 if firm i choose debt restructuring, 0 otherwise

y_{4it} = 1 if firm i choose equity issues, 0 otherwise

y_{5it} = 1 if firm i choose management restructuring, 0 otherwise

X_{1it} = Firm's leverage

X_{2it} = Interest coverage ratio (debt burden)

X_{3it} = % managerial shareholding.

X_{4it} = Proportion of outside directors to total directors

X_{5it} = Country's GDP growth rate

X_{6it} = Firm's size

D_{it} = 1 if firm i gets negative z-score in year t, 0 otherwise

Two models launched in this paper are Panel logit model and Multivariate probit model.

4.4.1 Panel logit model

To begin with, consider the index function (Z_{it})

$$Z_{it} = X_{it}^{'}\beta \tag{9}$$

$$Z_{it} = \ln\left(\frac{p_{it}}{1-p_{it}}\right) = X_{it}^{'}\beta \tag{10}$$

Where $\left(\frac{p_{it}}{1-p_{it}}\right)$ = Odd ratio

Z_{it} = Ln of odd ratio; it is linear with X_{it}

p_{it} = Probability of outcome that is nonlinear with X_{it}

$X_{it}^{'}$ = A set of agency variables and control variables

The odd ratio is written as $\left(\frac{p_{it}}{1-p_{it}}\right) = e^{X_{it}^{'}\beta}$ (11)

Odd ratio means that the probability of restructuring action will be taken to the probability not to be taken.

Then, $$p_{it} = \frac{e^{X_{it}^{'}\beta}}{1+e^{X_{it}^{'}\beta}} = \frac{1}{1+e^{-(X_{it}^{'}\beta)}} \tag{12}$$

The equation (12) represents the logistic distribution function. The above equation shows the function of pool logit model. In fact, for panel data, there is a presence of individual effects. Therefore, the another two types of logit model are mentioned.

- Panel logit with random effect model

$$p_{it} = \frac{e^{X_{it}^{'}\beta+u_{it}}}{1+e^{X_{it}^{'}\beta+u_{it}}} = \frac{1}{1+e^{-(X_{it}^{'}\beta+u_{it})}} \tag{13}$$

Assume random effect

$$u_{it} = \alpha_i + v_{it} \tag{14}$$

α_i = Cross-section random effect

v_{it} = Residual term

$Cov(\alpha_i, v_{it}) = 0$

- Panel logit with fixed effect model

$$p_{it} = \frac{e^{\beta_{0i} + X_{it}'\beta}}{1 + e^{\beta_{0i} + X_{it}'\beta}} = \frac{1}{1 + e^{-(\beta_{0i} + X_{it}'\beta)}} \tag{15}$$

Where β_{0i} = Individual fixed effect (Firm identity)

4.4.2 Multivariate Probit model

An alternative way to estimate the impact of firm's agency variables on choosing strategies is to apply multivariate probit regression. Because the logit regression takes into account for independent response, the multivariate probit regression is used for allowing dependence among restructuring strategies.

The multivariate probit model is usually when dependent variable has more than two choices (in this case, there are five). This model is a generalization of the probit model allowing the error term u_i to be correlated. Choosing restructuring is jointly modeled as a system with correlated error terms. The setting model here borrows Ramful and Zhao (2007) and Faccio and Sengupta (2006)

From unrelated regression model, the specification for the five equation model is

$$y_{ji}^{*} = X_{ji}'\beta + u_{ji} \ , \ j = 1, 2, 3, 4, 5 \tag{16}$$

y_{ji} = 1 if $y_{ji}^{*} > 0$, 0 otherwise

The dependent variables in the model are:

y_{1i} = Asset expansion

y_{2i} = Asset reduction

y_{3i} = Debt restructuring (17)

y_{4i} = Equity issue

y_{5i} = Managerial restructuring

y_{ji}^{*} is mapped to an observed binary discrete variable y_{ji} indicating whether or not a firm chooses a particular strategy.

Where $X_{ji}^{'}$ represents a vector of firm variables and other control variables that affect the restructuring strategy j. β is a vector of unknown parameters. Error terms, u_{ji}, are multivariate normally distribution with zero mean and a variance-covariance matrix Σ.

$$\begin{aligned} &E[u_{ji} \mid X] = 0 \\ &Var[u_{ji} \mid X] = 1 \\ &Cov[u_{ji}, u_{ki} \mid X] = \rho_{jk} \ , \ j \neq k \end{aligned} \tag{18}$$

For each univariate probit model, allowing the error term u_{ji} to be correlated, this leads to a multivariate probit model (MPV). Because restructuring strategies can occur at the same time, the error terms in all five equations in (16) jointly follow a multivariate normal distribution: $(u_1, u_2, u_3, u_4, u_5)' \sim MVN(0, \Sigma)$

The variance-covariance matrix (Σ) = $$\begin{pmatrix} 1 & \rho_{12} & \rho_{13} & \rho_{14} & \rho_{15} \\ \rho_{21} & 1 & \rho_{23} & \rho_{24} & \rho_{25} \\ \rho_{31} & \rho_{32} & 1 & \rho_{34} & \rho_{35} \\ \rho_{41} & \rho_{42} & \rho_{43} & 1 & \rho_{45} \\ \rho_{51} & \rho_{52} & \rho_{53} & \rho_{54} & 1 \end{pmatrix} \tag{19}$$

Where ρ_{jk} is the correlation coefficient of u_j and u_k (j, k = 1,2,…,5 ; j ≠ k). Thus, under this assumption, (16) and (18) give an MVP model that jointly represents the restructuring decisions for five strategies.

4.4.3 Market reaction analysis

In addition to identifying the choice on corporate restructuring by firm, the post-effect after restructuring action is tested by observing the market reaction. Stock return is used as a reflection on firm's action. Panel Least Square regression would be applied.

$$R_{it} = \delta_0 + \delta_1 D_{1it} + \delta_2 D_{2it} + \delta_3 D_{3it} + \delta_4 D_{4it} + \delta_5 D_{5it} + \delta_6 GDP_{it} + \delta_7 Size_{it} + u_{it} \qquad (20)$$

R_{it} is firm's stock return in time t

i is 1,2,…, n^{th} firm.

D_{1it} = 1 if firm i chooses asset expansion action in year t, 0 otherwise

D_{2it} = 1 if firm i chooses asset reduction action in year t, 0 otherwise

D_{3it} = 1 if firm i chooses debt restructuring action in year t, 0 otherwise

D_{4it} = 1 if firm i chooses equity issues action in year t, 0 otherwise

D_{5it} = 1 if firm i chooses management restructuring in year t, 0 otherwise

GDP_{it} = GDP Growth rate in year t

$Size_{it}$ = Size of firm i in year t

u_{it} = Error term

V. EMPIRICAL RESULTS

5.1 Basic statistics for explanatory variables

The study adopts the agency theory to be determinants to choosing restructuring strategies of firms which experienced poorly operating performance and severely financial shortage. Also, the additional factors such as economic condition proxied by country's GDP growth rate and firm's size are included the analysis. Table II summarizes basic statistics for these explanatory variables.

[Table II is here]

The sample data are 169 non-financial Thai companies listed in the Stock Exchange of Thailand during the years 1997-2007. To verify firms into the sample, Altman z-score (Altman,1968) is introduced. On average, non financial companies financed their capital by issue debts rather than raising fund by equity. Even though the median value of leverage is lower than its mean, debt ratio is still high. However, the ability to bear debt burden is small because the median of interest coverage ratio is just only 0.315 while its variation is dramatically steep. Considering both mean and median value for Altman z-score for 169 firms, the figure is very low reflecting poor operating performance and/or financial position during the time period.

5.2 Frequency of restructuring strategies

Table III reports the frequency of restructuring strategies conducted by the companies in the sample during the year 1997-2007. Five responses to performance and financial problems are asset expansion, asset reduction, debt restructuring, equity issue, and managerial restructuring.

[Table III is here]

During the years 1997-2007, most companies expand their asset sizes as well as selling assets for cash generating. Even though the percentage of firms taking debt restructuring is less than equity issues, the debt negotiation occurs more many times than issuing equity.

Interestingly, the management is highly turnover during the time period revealing the need to change management team in distress firms.

5.3 The sectors in the sample between years 1997-2007

Table IV categorizes the number of companies for each sector that fall into the sample between years 1997-2007. The sample does not contain companies in banking and financial sectors because of different in regulation and operation and financial structure.

[Table IV is here]

There are seven sectors under this study: Agriculture, Consumption, Industry, Property construction, Resources, Services, and Technology. The highest proportion of total companies is come from property construction sector. The Asian financial crisis occurring in Thailand 10 years ago caused property price slowing down and domestic demand was fallen. High proportion in foreign debt also got worse. Badly economic environment took many years to recover leading to decrease in firms' operating performance and financial health in a lot of sectors especially property construction, industry, and service sectors.

5.4 The impacts of firm's agency variables on restructuring strategy choices

The first objective of this study is to investigate the impact of firm's characteristics on the ways that firms choose to turnaround themselves when facing performance and financial problems. The methodology used here is about the binary response model. With reference to the sample contains both cross sectional and time series data, panel data technique is applied. The first model is called Panel logit model that can be divided into three subsets: Pool logit model, Panel logit with random effect model, and Panel logit with fixed effect model. These models are logistic distribution discussed in part IV. The regression result and marginal effect are shown in Table V and Table VI

[Table V is here]

[Table VI is here]

From table V and table VI, three models show their results in each panel respectively. Considering the panel B which details the model of panel logit with random effect outcome,

the statistic chibar^2 states the existence of individual firm effect. Then, using pool logit model to conclude the result should not be appropriated. The estimation needs to concern the matter of firm identity as suggested in previous part.

At present, there is no precise testing approach whether Random or Fixed effect model is better in case of Panel logit model. Suffering in the time of difficulty, firms need to restore their health by restructuring organizations. It can be stated that firm behaviors could be varied over time. Therefore, applying the Panel logit with Random effect model should be more suitable than Fixed effect model.

However, the logit model discussed above relies on the assumption of independent decision to choose restructuring strategies. Each strategy can be taken place without affect on the decision to select other strategies. Actually, one strategy event can alter the decision to choose other strategies. The likelihood ratio test in panel B of table VII confirms this argument.

[Table VII is here]

[Table VIII is here]

The Multivariate Probit model relaxes the assumption of independent decision on strategy choices. The estimated coefficients of the Multivariate Probit model are reported in panel A of table VII. Panel B shows the correlation of the error terms.

The likelihood ratio test of $\rho_{21} = \rho_{31} = \rho_{41} = \rho_{51} = \rho_{32} = \rho_{42} = \rho_{52} = \rho_{43} = \rho_{53} = \rho_{54} = 0$ concludes that the restructuring strategies are dependent (Chi^2 = 78.56 and p-value = 0.0000). Thus, the results estimated by the Multivariate Probit model could provide more accurate interpretations than logit model. The correlation between error terms reveals that the restructuring strategies are dependent for each other: (1) expansion and debt restructuring, (2) reduction and managerial restructuring, and (3) debt restructuring and equity issues. For each pair, one strategy results in the occurrence of another strategy. The first couple shows the negative relation between two strategies while the letter two groups explain the positive relationship within the groups. The overall results that are embedded to the dependence among strategies can be summarized.

To begin with, the highly leverage firm opposes to expand its business or production activities but at the same time it prefers to renegotiate to the creditors for setting new debt structure. This outcome is the same as previous studies (Sudarsanam and Lai, 2001; Lai and Sudarsanam, 1997; Pattnaik, 2005; Sengupta and Faccio, 2006). When the company's new debt contracts are approved by creditors, the creditor power is overwhelming. Lenders would not allow a very poor firm to invest additional projects because they are afraid of losing more money. The marginal effect in table VIII reports that the increasing in firm's leverage ratio 1% from its median value, the probability to choose expansion strategy will decrease by 0.05% but the leverage firm tends to renegotiate debt to creditors or asking for extending debt maturity by 0.02%. Further, debt restructuring process is followed by the equity issue for raising fund from external source. This procedure can be observed normally in Thai companies which accept debt restructuring action. Surprisingly, based on the positive correlation of asset reduction and managerial restructuring, the more leverage the firm takes, the higher possibility the firm does not sell assets and replace management. This is contrast to the hypothesis. The managers might sign agreement to guarantee debt obligations, so they have to make a responsibility to those covenants in the time of distress. Moreover, the sample companies in this case have severely steep in leverage ratio on average 119%[3]. The changing in management team might not be creditors' interests but rather they just want their money back. During distress period, the best way for solving firm's financial shortage is about the financial restructuring.

Secondly, the management ownership affects on the asset expansion and debt restructuring choices. Although the manager power is positively related to asset expansion, the impact cannot be significantly. The thing that can be stated is that an expansion and debt restructuring negatively correlated. During the problem, the management decides to expand business to searching for new market channel or trying to enhance the sale turnover whereas they will not do anything to destroy their control ability such as debt restructuring. Likewise,

[3] The leverage ratio higher than 100% means the debt portion is higher than asset while the shareholder portion is negative value.

they will not need to issue equity for raise of new fund through external source. Because the management also holds firm's stocks, they avoid dilution effect if the firms increase capital by issuing equity. If the management shareholding increases 1% in firm's stocks, the probability to enter debt restructuring process and issue equity will decrease by 0.11% and 0.34% respectively. Besides, the results present the positive correlation between reduction strategy and managerial replacement. It means that the managers with large proportion in stockholding will have strong power to reject the decreasing in firm's assets and changing in management framework. The probability to changing in manager position reduce 0.11% when the management hold more 1% ownership. Normally, the management team always concerns on being punished or replaced when the firm face performance trouble. But if their shareholding ownership is high enough to give those rights and power to control the firm, they possibly adopt any other strategies that are not management turnover. The impact of management shareholding on the strategy ways is consistent to the hypotheses.

Next, the outside directors also have positive effects on asset expansion but opposite on debt restructuring. Similar to the hypothesis, the outside directors have to protect shareholders value by influence on increasing the asset size rather than decreasing (Frederikslust et al., 2003; Hillier and McColgan, 2005). However, the outcome of debt restructuring does not follow the theoretical framework. As stated previously, the corporate governance stands for a monitoring mechanism to reduce the agency problem. Then, to relieve the effects of strategies taken on lenders and shareholders value, the high portion in outside directors would be likely to both enlarge businesses and sell non-core assets for cash inflow separately. The expansion might create value for firm in the future but it will be risky investment for lenders while the wealth will transfer from shareholders to creditors by doing debt restructuring. Then, to compensate for debt burden, selling useless assets and non-core businesses should be the solution in addition to expansion policy. Nonetheless, the asset sales cannot be the popular activity in Thai companies. The loss of competitiveness and shareholder value destroy should be the reason. When the proportion of outside directors increase 1% in the board composition,

the probability of asset expansion will increase 0.77% while the probability to ask for debt lowering and issue equity will decrease by 0.16% and 0.79%.

Taking into account for the control variables, the economic condition affects on the probability to choose both asset expansion and debt restructuring in the same direction. Based on the negative correlation between these two strategies, the above claim cannot be accepted. However, the economic growth rate includes the analysis as the control variable that could be different logic from the firm's agency variables. Generally, company has a chance to expand more production level or set up new subsidiaries when the economy has recovered. Meanwhile, the company can improve operating performance and financial position that enhancing its value and ability to bear debt burden as well as the negotiable power to creditors. The firm easily sells more equity in the stock market because of the blooming economic support. Contrary to the hypothesis, the size of firm has negative relationship to the probability of asset reduction. According to Sudasanam and Lai (2001), they suggest that the large firm size has a chance to dispose assets for cash but the asset reduction does not seem to be acceptable method in Thai companies. The possible reason is that when a firm enlarges its scale, it can enhance competitive power. Debt restructuring will be gradually reduced when a firm size is greater. The result is opposite to Lai and Sudasanam (1997) who conclude that a big firm've got many collaterals for debt restructuring. It can be explained that the firms with larger size do not choose debt restructuring because of the afraid of creditor power to control the firm.

In sums, the firm's agency monitoring variables could affect on the restructuring strategy choices. According to firm's characteristic, the management team should realize the several strategies to solve both operational and financial performance. In reality, the decision to choose any strategies could be dependent on each other. The asset expansion is negatively related to debt restructuring while equity issues occurs in the same time of debt negotiation. The reduction activities are positive relation to managerial restructuring.

5.5 The market reaction to restructuring strategies

The table IX reports the market reaction on restructuring strategies taken.

[Table IX is here]

The individual effect is important in the panel data topic. The statistic F-test denotes that the model has fixed effect and the Hausman test also insists on the correlation between firm identity and explanatory variables. Thus, applying fixed effect model to verify market reaction for each time horizon is more suitable.

In the time of restructuring strategies have been taken (Year 0), asset reduction and debt restructuring receive the best market response while the expansion strategy gets bad outcome. The positive stock returns on the asset reduction and debt restructuring are relevant to the results of international studies as Hillier, McColgan, and Werena (2008) and Kam, Citron, and Muradoglu (2008). These two activities could reflect the firm financial position immediately. Cash can be incurred since a poor firm takes sell-off transactions. Besides, by disposing of non-core assets, a firm can eliminate negative synergies with the divested assets and concentrate on core business to improve performance (Yawson, 2008). Even though debt restructuring provides the creditor power in monitoring firm management, the agency cost could be reduced leading to the firm value enhancing (Lasfer, Sudarsanam, and Taffler, 1996). Thus, debt restructuring can signify the good condition for firm' financial status.

Due to lacking of confidence to the expansion strategy, the investors in the market do not have good response on firm's stock price in the same year of strategy taken. The conflict of interest can be occurred among the management and shareholders because distress firms might not have enough capital to more investing. The shareholders need to maximize their wealth by taking risky projects but the managers are risk-averse, so the increasing in agency problem could negatively affect on the firm value. Yawson (2008) also support that expansion policy could be detrimental to firm value. The company cannot guarantee the reward from market extent or economies of scale in the production process in very near term. It might need the longer time to achieve. Moreover, despite the economic growth is recovering, there is no

incentive to invest more in poor firms. Rather, the investors could pay attention to normal stocks.

Over one year following the corporate restructuring (Year 1), the stock price performance reacts to only the managerial restructuring. The result is relevant to the claim that a new management can resolve the problem and develop novel strategies for a firm.

Two years after strategies launched (Year 2), the changing in management structure still takes the good market reaction and the expansion activities become the effective solution in this period. The outcome is the same as Pramotejitti (2005) who suggest the improvement in firm stock return by taking expansion strategy.

Overall, the study assesses the market reaction to restructuring strategies by the movement in stock return that reflects only the short term market expectation of the future firm performance. By taking each corporate restructuring, debt renegotiating and selling assets are efficient methods to realize the immediately in stock return. The success of asset expansion exists in 2 years after the activity having been introduced. Nonetheless, an evaluation the restructuring efficiency in the long run by using stock return as an indicator could not be attractive because there might be other situations attack in the stock price.

VI. CONCLUSION AND SUGGESTION

After the Asian Financial crisis occurring in 1997, most Thai companies encountered in financial distress and poor operating performance. There are a lot of restructuring types that Thai companies have done to rescue themselves being far away from bankruptcy and closing down the businesses.

Empirically, three main restructuring strategies would be describes. The first one is about asset restructuring which can be divided into two subsets: asset expansion and asset reduction. The second strategy is taken as financial restructuring which concerns about firm's capital structure between debt and equity. The managerial restructuring is the last group taking into account of changing in firm's management structure. Being with negative Altman z-score, 169 non-financial Thai companies' restructuring strategies are collected.

The logistic regression is applied based on the assumption of the independent decision whether to select each strategy while the multivariate probit regression relaxes this assumption. After testing for the correlation between the error terms in strategy equations, it can be summarized that the decision to choose strategies is dependent, which means that the independent assumption does not hold. The estimated outputs reveal that the decisions to choose restructuring strategies are dependent: (1) expansion and debt restructuring, (2) reduction and managerial restructuring, and (3) debt restructuring and equity issues. The first pair has negative relationship but the other two couples have positive direction within groups. The occurrence of one strategy will affect on the decision whether to select another strategy.

The empirical results suggest that the firm's agency monitoring factors have effects on the poor firms to choosing the restructuring strategies. However, an interest coverage ratio does not show any impact on the decision to select strategy choices. Also, the asset reduction strategy does not seem to be a popular approach for Thai firms unlike those in UK and Korea (Hillier , McColgan, and Werema, 2008; Pattnaik, 2005). The other agency variables such as leverage, management shareholding, and the proportion of outside directors show significant impacts on the restructuring activities. According to firm's characteristics, the management

should realize the several restructuring strategies to solve operational and financial performance.

In addition to the impacts of firm's characters on the decision whether to choose restructuring strategies, it is important to observe effectiveness of different kinds of restructuring

The effective strategies found in this study are asset reduction, debt restructuring, management restructuring and asset expansion. The market reaction to asset sales and debt restructuring reflect in the stock return within the same year as strategies taken while impact of changing in management and asset expansion will get the response in 2 years after these two strategies introduced. However, the market reaction in this case measures the strategy effective only in the short time period.

For further studies, the interaction effect of firm's characters on the decision to choose strategies should be considered. The results could yield greater explanation and illustrate in-depth analysis. The market reaction in this case depict only depict the strategy effective only in the short time period. For sustainable growth, the further analysis should consider the firm value creation.

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Table I

The relation between restructuring strategies and firm's agency variables

The strategies can be classified into five approaches. Each one could be functioned of firm's agency factors which are considered as firm's capital structure, management ownership, and corporate governance. The signs shown in the table inform the direction between firm's agency factors and approaches to take action.

Variables	Restructuring strategies				
	Expansion	**Reduction**	**Debt restructuring**	**Equity issue**	**Managerial restructuring**
Panel A: The set of Agency monitoring variables					
Leverage	-	+	+	+	+
Interest coverage ratio	+	-	-	-	-
Management shareholding	+	-	-	-	-
Outside directors	+	+	+	+	+
Panel B: The set of control variables					
GDP growth	+	+	+	+	-
Size	+	+	+	+	+

Table II

Descriptive statistics for Firm's agency variables, control variables, and Altman z-score

The table summarizes basic statistics for firm's agency and control variables. Besides, the altman z-score would be considered in description. The statistic value contains the number of observation, mean, median, and standard deviation. Firm's leverage can be computed by the ratio of total debt to total capital. The interest coverage ratio is the ratio between earning before tax and interest to interest expenses. It measures firm's debt burden. The ownership by management is % shareholding by directors and top management. Outside directors would represent corporate governance measured by the proportion of independent directors. The other three factors act as control variables: GDP growth rate, firm's size, and liquidity. The last figure measures of a firm's bankruptcy likelihood. Altman (1968) was the first who introduced the computation. The formula: $Z = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E$. Where A is the ratio of working capital to total assets. B represents retained earnings to total assets. C is calculated by Earning before tax and interest to total assets. D represents the market condition and E pictures firm's turnover ratio.

Variables	**Observation**	**Mean**	**Median**	**Standard deviation**
Leverage	1543	1.199	0.742	2.412
Interest coverage ratio	1543	45.48	0.315	1188.02
Management shareholding	1543	0.148	0.069	0.176
Outside directors	1543	0.308	0.3	0.136
GDP growth rate	1543	0.028	0.048	0.05
Size	1543	6.18	6.082	1.917
Liquidity	1543	0.417	0.068	1.913
Altman z-score	1543	-0.20	0.23	8.67

Table III

The number of restructuring strategies taken by sample companies between 1997-2007

The table reports the frequency of restructuring strategies operated by the companies in the sample. There are 169 companies which experienced negative altman z-score at least one year during years 1997-2007. The negative altman z-score can represent poor operating performance and financial problem.

Strategies taken by sample companies	**Frequency of strategies taken**	**% of total number of strategies**	**The number of companies taking strategies**	**% of total companies in each groups**
Asset restructuring				
Asset expansion	431	18.71%	131	77.51%
Asset reduction	247	10.72%	118	69.82%
Financial restructuring				
Debt restructuring	659	28.6%	87	51.48%
Equity issue	297	12.89%	114	67.46%
Managerial restructuring	670	29.08%	102	60.36%
Total number of strategies taken	2304	100%	-	-
Total companies in sample	-	-	169	100%

Table IV

The companies' sectors in the sample between years 1997-2007

This table categorizes the number of companies for each sector that fall into the sample between 1997-2007. The main sectors determined by the Stock Exchange of Thailand can be divided into eight sectors. However, this study considers only seven sectors: Agriculture, Consumption, Industry, Property construction, Resource, Service, and Technology. Financial sector has not been included into the data scope because this sector is different to other sectors in case of operation structure.

Sector	Number of firms	%
Agriculture	14	8.28%
Consumption	21	12.43%
Industry	27	15.97%
Property construction	60	35.5%
Resources	2	1.18%
Services	30	17.75%
Technology	15	8.88%
Total	**169**	**100%**

Table V

The logistic regression results

The table shows the logistic regression results of restructuring strategies on firm's agency and control variables. Coefficients of the logistic regressions are presented. The dependent variable is equal to 1 if the certain strategy is taken and 0 otherwise. The sample consists of 169 firms experiencing a decline in operating performance or financial status between the periods 1997-2007. To classify which company is included into the sample, Altman z-score can be applied. Panel A shows the results estimated by pool logit model. Panel B reveals the outcome estimated by panel logit with random effect model while Panel C gives the results estimated by panel logit with fixed effect model.
Equation: Restructuring strategy= f (Leverage, interest coverage ratio, Management ownership, governance, and control variables)

Variables	Restructuring strategies									
	Expansion		Reduction		Debt restructuring		Equity issues		Managerial restructuring	
Panel A: Pool logit										
Leverage	-0.001061		-0.000723		0.001740	***	0.000169		-0.000830	**
Interest Coverage Ratio	-2.41E-07		2.13E-06		4.60E-07		-9.22E-07		4.85E-07	
Management shareholding	0.001014		-0.002501		-0.005893	*	-0.005448		-0.012039	***
Outside directors	0.020701	***	0.007293		-0.010785	**	-0.015826	***	0.005234	
GDP growth rate	0.019014		-0.009996		0.135396	***	0.041363	***	-0.030725	***
Firm size	0.243862	***	-0.078038	*	-0.062666	*	0.098584	**	0.117517	***
Year dummy	-0.672669	***	0.440067	***	1.207917	***	0.259261	*	0.333300	***
Constant	-2.902529	***	-1.484428	***	-0.634342	**	-1.758968	***	-0.952864	***
Observation	1543		1543		1543		1543		1543	
Log likelihood	-818.36557		-666.92917		-920.35132		-741.79479		-1029.1637	
Pseudo R^2	0.10457701		0.01721226		0.12602422		0.01848459		0.02553659	
$Chi^{2[a]}$	191.15484	***	23.360814	***	265.42282	***	27.940002	***	53.940109	***

Table V (Continued)

The logistic regression results

Variables	Restructuring strategies									
	Expansion		**Reduction**		**Debt restructuring**		**Equity issues**		**Managerial restructuring**	
Panel B: Panel Logit with Random effect										
Leverage	-0.0012764	*	-0.0005237		0.0014799	**	0.0001135		-0.0009551	**
Interest Coverage Ratio	-1.52E-07		2.26E-06		2.56E-07		-8.57E-07		3.52E-07	
Management shareholding	0.0004477		-0.0027517		-0.0024912		-0.0042150		-0.0085819	**
Outside directors	0.0176320	***	0.0098516		-0.0063095		-0.0195919	***	0.0043787	
GDP growth rate	0.0267356		-0.0144897		0.1650210	***	0.0460517	***	-0.0307515	**
Firm size	0.2644313	***	-0.0714106		-0.2549380	***	0.0687354		0.1233771	***
Year dummy	-0.7280972	***	0.4285539	**	0.9713287	***	0.1189369		0.2539812	*
Constant	-3.0369265	***	-1.7762037	***	0.2089784		-1.5904566	***	-0.9703378	***
Observation	1543		1543		1543		1543		1543	
Log likelihood	-795.78278		-653.89554		-853.56307		-728.86951		-1004.025	
Pseudo R^2	0.091260957		0.014772427		0.11118659		0.013067337		0.015719664	
Chi^2	131.53396	***	15.380732	**	159.53211	***	18.352428	**	28.68921	***
$Chibar^{2[b]}$	45.17	***	26.07	***	133.58	***	25.85	***	50.28	***

Table V (Continued)

The logistic regression results

Variables	Restructuring strategies									
	Expansion		**Reduction**		**Debt restructuring**		**Equity issues**		**Managerial restructuring**	
Panel C: Panel logit with Fixed effect										
Leverage	-0.0017847	**	-0.000146		0.0012259	**	-0.0000102		-0.0009780	**
Interest Coverage Ratio	-6.80E-08		1.86E-06		1.73E-07		-7.08E-07		1.86E-07	
Management shareholding	-0.0005283		-0.000292		0.0032887		0.0006072		0.0011458	
Outside directors	0.0078406		0.013027	*	0.0010089		-0.0219450	***	0.0021703	
GDP growth rate	0.0332742	*	-0.020900		0.1607299	***	0.0503561	***	-0.0231836	*
Firm size	0.2773177	***	-0.001253		-0.4301897	***	-0.0531647		0.0958335	
Year dummy	-0.6298314	***	0.376682	*	0.5996236	***	-0.1634262		0.0634850	
Observation[c]	1352		1141		1321		1161		1446	
Log likelihood	-504.11666		-393.40065		-501.38874		-453.09185		-662.30793	
Pseudo R^2	0.10156383		0.01509679		0.16085599		0.01655807		0.01311248	
Chi^2	113.97586	***	12.060243	*	192.22298	***	15.257288	**	17.59977	**

[a] This is the statistic value to test whether the model is explainable.

[b] $Chibar^2$ is used to test the firm effect in the model.

[c] Some observations are drop in the Panel logit with fixed effect model because the firms with outcome $y_{jit} = 1$ or $y_{jit} = 0$ for every year will be excluded (See Equation 8).

***, **, * indicate significant level at 1%, 5% and 10% respectively.

Table VI

The marginal effect of logistic regression

The table VI records the marginal effect of change in a regressor on the conditional probability that y=1. The explanatory factors are leverage, interest coverage ratio, management shareholding, the proportion of outside directors, and control variables. There are three models in logistic regression: Pool logit, Panel logit with random effect, and Panel logit with fixed effect. The marginal effect describes the changing in probability to choose certain restructuring strategy when all exogenous variables are changing from their medians. Instead of mean, this study considers the median in order to avoid the extreme value of explanatory variables. The median values for explanatory variables are in percent except size and year dummy. Size represents in unit and year dummy changes between 1 and 0. Note that, the marginal effects are calculated based on the zero constant.

Variables	**Median**	**Restructuring strategies**				
		Expansion	**Reduction**	**Debt restructuring**	**Equity issue**	**Managerial restructuring**
Panel A: The marginal effects for Pool logit model						
Leverage	74.22	-0.0001	-0.0001	0.0004	4.15e-05	-0.0002
Interest Coverage Ratio	31.52	-2.3e-08	5.1e-07	1.15e-07	-2.25e-07	1.11e-07
Management shareholding	6.93	9.6e-05	-0.0006	-0.0014	-0.0013	-0.0027
Outside directors	30	0.0019	0.0017	-0.0027	-0.0038	0.0012
GDP growth	4.78	0.0018	-0.0024	0.0338	0.0101	-0.0071
Size	6.08	0.0232	-0.0188	-0.0156	0.0241	0.027
Year dummy	0	-0.0641	0.1062	0.3019	0.0634	0.0767

Table VI (Continued)

The marginal effect of logistic regression

Variables	Median	Restructuring strategies				
		Expansion	**Reduction**	**Debt restructuring**	**Equity issue**	**Managerial restructuring**
Panel B: The marginal effects for Panel logit with random effect model						
Leverage	74.22	-0.0001	-0.0001	0.0003	2.83e-05	-0.0002
Interest Coverage Ratio	31.52	-1.4e-08	5.5e-07	5.3e-08	-2.14e-07	8.03e-08
Management shareholding	6.93	4.1e-05	-0.0006	-0.0005	-0.0011	-0.0019
Outside directors	30	0.0016	0.0024	-0.0013	-0.0049	0.001
GDP growth	4.78	0.0024	-0.0036	0.0345	0.0115	-0.007
Size	6.08	0.0242	-0.0175	-0.0533	0.0172	0.0282
Year dummy	0	-0.0667	0.1052	0.2031	0.0297	0.058

Table VI (Continued)

The marginal effect of logistic regression

Variables	Median	Restructuring strategies				
		Expansion	**Reduction**	**Debt restructuring**	**Equity issue**	**Managerial restructuring**
Panel C: The marginal effects for Panel logit with fixed effect model						
Leverage	74.14	-0.0002	-0.00004	0.0001	-0.000002	-0.0002
Interest Coverage Ratio	43.34	-7.3e-09	4.57e-07	2.22e-08	-1.54e-07	4.3e-08
Management shareholding	6.79	-5.6e-05	-0.00007	0.0004	0.0001	0.0003
Outside directors	30	0.0008	0.0032	0.0001	-0.0047	0.0005
GDP growth	4.78	0.0035	-0.0051	0.0206	0.0109	-0.0054
Size	6.17	0.0296	-0.0003	-0.0552	-0.0116	0.0226
Year dummy	0	-0.0674	0.0891	0.0938	-0.0345	0.0148

Table VII

The Multivariate Probit regression results

The table shows the multivariate probit regression results of restructuring strategies on firm's agency and control variables. Coefficients of the logistic regressions are presented and the marginal effects are recorded in the parentheses below. The dependent variable is equal to 1 if the certain strategy is taken and 0 otherwise. The marginal effect describes the changing in probability to choose certain restructuring strategy when all exogenous variables are varied from their medians. The sample consists of 169 firms experiencing a decline in operating performance or financial status between the periods 1997-2007. To classify which company is included into the sample, Altman z-score can be applied. For the multivariate probit model, the dependent variable is a vector of firm's responses. The five responses are ordered as follows: asset expansion, asset reduction, debt restructuring, equity issue, and managerial restructuring. Panel A is the results of multivariate probit regression. Panel B reports the correlation coefficient of error terms. The likelihood ratio test of $\rho_{21} = \rho_{31} = \rho_{41} = \rho_{51} = \rho_{32} = \rho_{42} = \rho_{52} = \rho_{43} = \rho_{53} = \rho_{54} = 0$ concludes that the restructuring strategies are dependent.

Equation: Restructuring strategy= f (Leverage, interest coverage ratio, Management ownership, governance, and control variables)

Variables	Restructuring strategies									
	Expansion		Reduction		Debt restructuring		Equity issues		Managerial restructuring	
Panel A: Multivariate Probit Model										
Leverage	-0.0008760	**	-0.000232		0.0009409	***	0.0001815		-0.0002950	*
Interest Coverage Ratio	-5.93E-08		1.19E-06		1.25E-07		-4.09E-07		2.65E-07	
Management shareholding	0.0016751		-0.002302		-0.0060684	***	-0.0039378	*	-0.0077204	***
Outside directors	0.0124700	***	0.003459		-0.0082310	***	-0.0090409	***	0.0026275	
GDP growth rate	0.0171524	*	-0.008852		0.0634924	***	0.0197256	**	-0.0213350	***
Firm size	0.1720790	***	-0.063264	***	-0.1051319	***	0.0438501	**	0.0571631	***
Constant	-2.0704810	***	-0.636694	***	0.5159247	***	-0.8907171	***	-0.3960649	***
Observation	1543									
Log likelihood	-4212.171									
Pseudo R^2	4.42%									
Chi^2	353.46495	***								

Table VII (Continued)

The Multivariate Probit regression results

Panel B: Estimates of the covariance terms of multivariate probit model

	ρ_1	ρ_2	ρ_3	ρ_4	ρ_5
ρ_1	1				
ρ_2	-0.05	1			
ρ_3	-0.1204***	0.0009	1		
ρ_4	0.0004	-0.0525	0.3519***	1	
ρ_5	0.0092	0.1193***	-0.0115	-0.0404	1

Likelihood ratio test of
$\rho_{21} = \rho_{31} = \rho_{41} = \rho_{51} = \rho_{32} = \rho_{42} = \rho_{52} = \rho_{43} = \rho_{53} = \rho_{54} = 0$:

Chi2 = 78.56
Prob > Chi2 = 0.0000

***, **, * indicate significant level at 1%, 5% and 10% respectively.

Table VIII

The marginal effect of Multivariate Probit regression

The table VIII records the marginal effect of change in a regressor on the conditional probability that y=1. The explanatory factors are leverage, interest coverage ratio, management shareholding, the proportion of outside directors, and control variables. The Multivariate Probit model relaxes the assumption of the independence decision to choose the strategy choices. The marginal effect describes the changing in probability to choose certain restructuring strategy when all exogenous variables are changing from their medians.

Variables	Median	Restructuring strategies				
		Expansion	Reduction	Debt restructuring	Equity issue	Managerial restructuring
Leverage	74.22	-0.00054	-0.0002	0.0002	0.0001	-0.00004
Interest Coverage Ratio	31.52	-3.7e-08	1.2e-06	2.4e-08	-3.6e-07	3.7e-08
Management shareholding	6.93	0.001	-0.0023	-0.0011	-0.0034	-0.0011
Outside directors	30	0.0077	0.0034	-0.0016	-0.0079	0.0003
GDP growth	4.78	0.0106	-0.0088	0.0121	0.0173	-0.0029
Size	6.08	0.1065	-0.0632	-0.0201	0.0383	0.0079

Table IX

The Market reaction to the restructuring strategies

The table IX reports the market reaction to the strategies taken. The first model is fixed effect model which concerns about firm identity effect and the second is the random effect model. The analysis for each model is divided into three time horizons. Year 0 presents the market reaction to any strategies occurring in the same period. Year 1 considers the investor response to the corporate restructuring after one year passed. Year 2 represents the stock market reaction in 2 years after the strategies have been launched in year 0. The market reaction can be measured by stock return. In case of year 1, the stock return is calculated by comparing stock price in year 1 to the stock price in year 0. The study computes the stock return after 2 years by comparing the stock price in year 2 to the stock price in year 0. Three models are in considered: Ordinary Least Squares, Panel Fixed effect, and Panel Random effect model.
The time period of restructuring strategies is 1997-2007.
Stock return= f (expansion, reduction, debt restructuring, equity issue, managerial restructuring, and control variables)

Variables	OLS			Panel Fixed effect			Panel Random effect		
	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2	Year 0	Year 1	Year 2
Expansion	-18.6	0.7	16.5	-25.8 *	13.7	43.7 **	-20.1	4.2	20.9
Reduction	37.4 **	15.9	-25.0	33.4 *	18.1	1.6	38.4 **	17.5	-20.1
Debt restructuring	19.6	2.8	8.5	52.5 ***	0.1	-8.3	25.4 *	3.0	7.6
Equity issues	-5.4	16.1	-2.7	-16.2	-3.9	-9.9	-7.2	13.3	-0.7
Management restructuring	-6.5	22.1 *	26.3	-3.7	20.9 *	33.1 *	-6.3	23.3 **	29.3 *
GDP growth rate	0.7	-2.7 **	0.4	-3.7 **	0.6	8.8 ***	-0.1	-2.2 *	1.3
Firm size	14.2 ***	-16.3 ***	-35.9 ***	40.3 ***	-47.4 ***	-106.1 ***	18.1 ***	-22.0 ***	-43.0 ***
Constant	-68.8 ***	133.6 ***	285.8 ***	-241 ***	336.6 ***	726.9 ***	-93.2 ***	170.2 ***	327.1 ***

Table IX (Continued)

The Market reaction to the restructuring strategies

Variables	OLS			Panel Fixed effect			Panel Random effect		
	Year 0	**Year 1**	**Year 2**	**Year 0**	**Year 1**	**Year 2**	**Year 0**	**Year 1**	**Year 2**
Observation	911	911	826	911	911	826	911	911	826
R^2	0.027	0.045	0.058	0.062	0.098	0.178	0.052	0.084	0.161
Model p-value	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
F-test (ui=0)				1.41 ***	1.61 ***	2.3 ***			
Hausman test							45.96 ***	49.53 ***	105.14 ***

[a] The variable SIZE in this study is proxied by Ln(market capitalization) as stated in Part IV. The interpretation of coefficient in the case of level-log unit, it can be concluded that $\Delta y = \left(\frac{\beta}{100}\right) \% \Delta x$ where Δy is the changing in stock return, β is coefficient from the regression, and Δx is the changing in market capitalization. For example, according to the fixed effect model, when there is a changing in firm's market capitalization 1% in year 0, the stock return in year 2 will decrease about 1.06%. (See Wooldridge, 2006, pp. 49, 236)

[b] is the statistic testing for firm effect with the null hypothesis that the variance of error term is constant.

[c] is the Hausman test stating the null hypothesis that the difference in coefficients is not systematic. It examines the fixed effect in the model. The rejection of null hypothesis means that the firm identity is fixed over time.

***, **, * indicate significant level at 1%, 5% and 10% respectively.