CHAPTER III

RESEARCH METHODOLOGY

This study applies an event study method by using a sample comprised of firms listed on the SET. This chapter presents the research methodology applied in this study. It consists of method, variables, models, as well as data and data sources.

3.1 The Method

Studies investigating the information content of cash flows information typically apply the regression analysis method (e.g. Bowen et al., 1987; Bernard and Stober, 1989; Livnat and Zarowin, 1990; Jenning, 1990; Ali, 1994; Clubb, 1995; Biddle et al., 1995) to quantify the association between abnormal stock returns and unexpected cash flows measures. Consistent with previous research, the present study uses the regression analysis method for testing hypotheses on a cross-sectional basis.

However, a long window association study applied by prior studies cannot detect whether an accounting number conveys useful information to the market. In order to detect such implications of accounting number, I use the event study method suggested by Watt and Zimmerman (1986) and Beaver (1998) (about the method detecting the information content of accounting numbers).

The event study method performs an investigation of whether the release of accounting information has an impact on security prices. If the accounting information is

meaningful as new information to the market, the security prices will significantly response to it at the time of the announcement.

However, the released accounting numbers may not be new information as a whole. Some parts of such numbers might be expected by the market (for example, earnings and cash flows). Therefore, the market will react to the release of such numbers if it conveys new information that not already is reflected in security prices. The coefficient from a regression of abnormal security returns on unexpected accounting numbers surrounding the announcement can be used as a measure of the market reaction to these numbers.

3.2 The Model

The present study investigates whether cash flows convey incremental information to the market. I examine the association between CAR and cash flows measures during the period of quarterly reports announcement (the event study). Then, given that earnings is the primary source of information affecting future cash flows for investors (Lev, 1989), I investigate the incremental information content of cash flows beyond earnings. Further, I examine the effects of three factors as discussed above on the incremental information content of cash flows beyond earnings.

The basic linear model of the incremental information content of cash flows and earnings can be written by following.

$$CAR_{it} = \gamma_0^1 + \gamma_1^1 UE_{it} + \gamma_2^1 UCFO_{it} + \varepsilon_{it} \quad (12)$$

Where:

CAR_{it} = cumulative abnormal returns on common stocks of firm i during announcement period t

UE_{it} = unexpected earnings in period t for firm i

$UCFO_{it}$ = unexpected net cash flows from operating activity in period t for firm i

ε_{it} = error term for firm i in period t

According to the basic accounting identity UE $\equiv$ UCFO + UA, where UA denotes unexpected (total) accruals, the incremental information content of CFO beyond earnings can be investigated by performing the test on γ_2^1 (test by $\gamma_2^1 = 0$). $\gamma_2^1 \neq 0$ implies that the two components of earnings (CFO and total accruals) are valued unequally by investors. In contrast, the incremental information content of earnings beyond CFO is tested using the coefficient γ_1^1, which indicate whether total accruals make a contribution to earnings.

Further, I incorporate two other reported cash flows (i.e. CFI and CFF) into the analysis. I use a dummy variable approach in order to test the impact of the firms' characteristics on the incremental information content of cash flows beyond earnings. As a result, the general model underlying my tests of each hypothesis can be written as follows:

$$CAR_{it} = \beta_0^m + \beta_1^m D_f + \beta_2^m UE_{it} + \beta_3^m UCFO_{it} + \beta_4^m UCFI_{it} + \beta_5^m UCFF_{it} + \beta_6^m UE_{it} D_f + \beta_7^m UCFO_{it} D_f + \beta_8^m UCFI_{it} D_f + \beta_9^m UCFF_{it} D_f + \varepsilon_{it} \quad (13)$$

where, $UCFI_{it}$ = unexpected net cash flows from investing activity in period t for firm i

$UCFF_{it}$ = unexpected net cash flows from financing activity in period t for firm i

D_f is a dummy variable which takes the value of one or zero

3.3 The Variables

3.3.1 Dependent variable

This study uses 4 periods of cumulative abnormal returns, those are CARs computed on the announcement date (CAR_0), over the day before the announcement date and on the announcement date ($CAR_{-1,0}$), over the announcement date and the day after the announcement date ($CAR_{0,+1}$) and over 3 days around the announcement of quarterly reports ($CAR_{-1,+1}$). Each measure is used as a dependent variable in the present study. An abnormal return, rather than a raw return, is used because using only the firm-specific return component (i.e. after adjusting for the return on the market portfolio) can enhance the power in testing the information content of accounting information (Kothari, 2001). The abnormal returns are obtained by the following procedure.

3.3.1.1 Actual returns

This study uses the daily return index (RI) of the Data Stream in computing stock returns and cumulative abnormal returns over the announcement periods. The RI shows a theoretical growth in value of a share holding over a specific period, assuming that dividends are re-invested to purchase additional units of equity at the closing price applicable on the ex-dividend date;

$$RI_t = RI_{t-1} * \frac{P_t}{P_{t-1}} \quad (14)$$

except when t is ex-date of the dividend payment D_t, then:

$$RI_t = RI_{t-1} * \frac{P_t + D_t}{P_{t-1}} \quad (15)$$

Where:

RI_t = return index on day t

RI_{t-1} = return index on day t-1

P_t = price on ex-date

P_{t-1} = price on previous day

D_t = dividend payment associated with ex-date t

The calculation ignores tax and re-investment charges. Gross dividends are used and adjusted closing prices are used to establish the price index (and hence return index).

3.3.1.2 Abnormal returns

To determine an abnormal return for a period, an estimate of the expected return is required. The present study uses the traditional market model to define the expected return and the abnormal return during periods by the following procedure.

(a) Estimating the market model parameters by OLS regression:

$$R_{it} = \alpha_i + \beta_i RM_t + \varepsilon_{it} \qquad (16)$$

where:

R_{it} = $\ln(RI_{it}/ RI_{it-1})$

RM_{it} = $\ln(SI_t/SI_{t-1})$

t = -60,.....,-1 (i.e. 60 days before announcement period)

ε_{it} = random disturbance for firm i on day t

SI_t = marketable security price index (estimated by SET price index) on day t

SI_{t-1} = marketable security price index (estimated by SET price index) on day t-1

(b) For any firm i, using the parameters from the estimation period (i.e. $\hat{\alpha}_i$ and $\hat{\beta}_i$), where the parameters are assumed to be constant during the test period, to compute the daily abnormal return as following:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i RM_t) \qquad (17)$$

where, AR_{it} is an abnormal daily return for firm i on day t.

3.3.1.3 Accumulating of abnormal returns over announcement periods

The cumulative abnormal returns (CARs) around the announcement are computed for firm i by follow:

$$CAR_{it} = \prod_{t=1}^{N}(1 + AR_{it}) - 1 \qquad (18)$$

where: CAR_{it} = cumulative abnormal return for firm i surrounding an announcement period t

N = number of days relating of a window of interest

The main purpose of this study is investigation of the impacts of a release of accounting information (earnings and cash flows). The previous studies on the reaction of the SET on earnings announcement show that the stock prices significantly react to the new information in three days surround an announcement, i.e. the day before an announcement, the announcement day and the day after an announcement (Nimnaul Keorath, 1996; Pimpana Srisawasdi, 1996). So, this study performs the analysis regarding three days surrounding the announcements.

3.3.2 The independent variables

All of the cash flows variables of the present study are taken from the quarterly cash flows statements. The various cash flows variables are:

- CFO is measured as net cash flows form operating activity
- CFI is measured as net cash flows from investing activity
- CFF is measured as net cash flows from financing activity
- Earnings are measured as net income before extraordinary items

3.3.2.1 The expectation model of earnings and cash flows measures

A part of the information in reported earnings and reported cash flows is already reflected in stock prices due to the expectation of investors regarding previous information. The unexpected earnings and cash flows are new information that the market receives at the time of the announcement of reported earnings and reported cash flows. The stock prices should react only to the new information of the release. Previous studies provide evidence consistent with the idea that the market reacts on new information releases only, with impact to earnings announcements (e.g. Ball and Brown, 1968; Beaver, 1968; Foster, 1977; Nimnaul Keorath, 1996; Pimpana Srisawasdi, 1996) and cash flows (e.g. Wilson, 1986 and 1987; Bernard and Stober, 1989). As a result, an expectation model is constructed in order to measure new information released via announcements of earnings and cash flows. In the literature, earnings forecast models are derived using two approaches; the technical forecasting model and analysts forecasts. The technical forecasting model is derived based on a statistical model (mathematics), for example, Box-Jenkins Model, Seasonal Model, Non-seasonal Model. Analysts forecasts are estimations of earnings and cash flows, that the analysts of financial institutions prepare and release to the public through media, such as the Wall Street Journal.

Previous research regarding the return-earnings association presents that the analysts forecasts provide the best accurate expectation model whilst the Box – Jenkins model is the best of technical forecasting models (Ball and Watt, 1972; Foster, 1977).

However, there is no existing official analysts forecasts for the firms at the SET that can be (reasonably) used as an expectation model of earnings and cash flows. Further, there is not enough historical quarterly data for the companies listed on the SET to perform the Box – Jenkins model. As a result, I use a seasonal model in this study which is consistent with prior studies using data from the SET (Nimnaul Keorath, 1996, Pimpana Srisawasdi, 1996).

However, a simple random walk expectation model of earnings and cash flows measures is widely supported by the literature (e.g. Bowen et al., 1986; Raybern, 1986; Livnat and Zarowin, 1990; Biddle et al., 1995) as an efficient expectation model for estimating the expectation of earnings and cash flows information. Therefore, the present study uses a simple seasonal random walk model to measure the expectation of earnings and cash flows that can be expressed as follows.

$$E(X_{mit}) = X_{mit-4} \qquad (19)$$

Where; $E(.)$ = expectation of earnings or cash flows

X_{mit} = earnings or cash flows measures 'm' for firm i in quarter t

m = Earnings, CFO, CFI, and CFF

3.3.2.2 The measure of types of a firm

The present study uses the ratio of market to book value of equity at the end of previous period (hereafter MVE_{t-1}/BVE_{t-1}) as a measure of firm's current type. This is consistent with prior studies regarding components of cash flows (Kerstein and Kim, 1995; Charitou et al., 2001). The market value of equity is computed as follows.

$$MVE = CLOSP \times SHAREO \quad (20)$$

where:

MVE = the market value of equity at the end of trading quarter

CLOSP = last closing price of the quarter

SHAREO = number of share outstanding at the end of quarter

The MVE/BVE calculated at the end of the previous quarter (i.e. quarter t-1) is a measure of growth/value firms for quarter t. The quarter-observations are categorized into growth and value stocks based on MVE_{t-1}/BVE_{t-1} with respect to the median. As a result, the first portfolio, which is the group with the lowest values of MVE_{t-1}/BVE_{t-1}, is surrogated for the value stocks while the last portfolio, which is the group with the highest value of MVE_{t-1}/BVE_{t-1}, is surrogated for the growth stocks. However, note here that the classification of firms' types is subjected to characteristic of the sample of this study.

3.3.2.3 The measure of transitory of earnings

Transitory of earnings is classified as low and high levels. It is measured based on prior studies (Cheng et al.,1996; Charitou et al.,2000 and 2001), as the absolute change in earnings deflated by market value of equity at the beginning of the periods, denoted by $\frac{|E_t - E_{t-1}|}{MVE_{t-1}}$. Then, all of the quarter-observations are classified into 2 groups with respect to the median. The first (last) group that has lowest (highest)

$\frac{|E_t - E_{t-1}|}{MVE_{t-1}}$ stands for the low (high) transitory of earnings. As a result, the classification of earnings transitory is also subjected to characteristic of the sample of this study.

3.3.2.4 The measure of CFI/CFF ratio

The CFI/CFF ratio examined in this study is measured from net cash outflows from investing activities scaled by net cash inflows from financing activities. In order to economically interpret this ratio regarding firms' capital flexibility as discussed in section 2.3.2.3 above, this study examines only the cases of a negative net cash flow of investing activities (i.e. net cash outflows) with a positive net cash flow from financing activities (i.e. net cash inflows). Then, examining the negative net cash flow of investing activities by its absolute value to earn the positive value of the ratio in order to facilitate the determination of events, i.e. less and more than one values of the ratio (see section 2.3.2.3).

3.4 Data and Data Sources

The data (of market information) used to measure the dependent variable (i.e. RI and SI) are extracted from the Data Stream. Data regarding financial information of firms are obtained from the annual financial statements of the firms in I-SIMS CD-ROM. Cash flows measures are taken from the Statements of cash flows.

The sample consists of companies listing on the SET, that meet the following criteria:

- Those are non-financial and non-insurance firms due to the unique type of businesses and some specific legal acts, e.g. acts of the Bank of Thailand.
- All required data are available on the Data Stream and on the Listed Company Info and I-SIMS CD-ROM during the second quarter of 1998 to second quarter of 2001. This restriction is produced to ensure availability of data. This period is required because the quarterly Statement of Cash flows is mandated for first time in the second quarter of 1998.
- Have no announcements of other information during the announcement of a quarterly financial report.
- A December firm (i.e. company applying a fiscal year ended of 31st December). This condition intends to enhance comparability among firms.

3.5 The Expectation of Results

This section presents the regression model used to test hypothesis discussing in previous section and inclusive with the expectation of results.

3.5.1 The incremental information content of cash flows beyond earnings

The following regression model is used to test hypothesis H1.

$$CAR_{it} = \beta_0^1 + \beta_1^1 UE_{it} + \beta_2^1 UCFO_{it} + \beta_3^1 UCFI_{it} + \beta_4^1 UCFF_{it} + \varepsilon_{it} \qquad \text{(T-1)}$$

Cash flow is the primitive concept of discounted dividend valuation model because dividends are normally paid in cash. CFO, then, is the indicator of investors'

future cash flows that will be received in term of cash dividend. As a result, CFO information has implication to stock pricing. Further, earnings are argued on its manipulation that CFO plays a role of alternative information in predicting the firms' future cash flows. Therefore, I expect that β_2^1 has a positive sign.

From a theoretical perspective, there is a perception that investments generally lead to a good opportunity for a firm to generate income, as an increase in investments is related to higher future cash flows of a firm, and then increases the firm's value (McConel and Muscarella, 1985; John and Mishra, 1990; Livnat and Zarowin, 1990; Kerstein and Kim 1995). Smith (1990) comments on the investors' interpretation of investments of a firm, that under the information disparity between managers and potential investors, investors interpret increases in investment as a positive change in implied cash flow (that they react favorably), while decreases in investment are perceived as negative. The empirical studies indicate that announcements of increased capital expenditure are concurrent with increased stock prices, and by contrast, announcements of decreased capital expenditures are following by declining stock prices (McConnell and Muscarella, 1985; Kerstein and Kim, 1995). Further, the evidence by Livnat and Zarowin (1990) and Kanokporn Narktuptee (2000) indicate that the total amount of cash flows from investing activities are value relevant, and investors perceive net cash outflows from investing activities (net negative CFI) as good news. Therefore, I predict a negative association between UCFI and CAR that is indicated by a negative sing of β_3^1.

Prior studies provide inconclusive evidence about the information containing in financing activities. Theoretical and empirical studies suggest that stock markets react negatively to issuances of equity (e.g. Ross, 1977; Myers and Majluf, 1984; Miller and Rock, 1985; Asquith and Mullins, 1886; Masulis and Korwa, 1986; Mikelson and Partch, 1986; Jarukitsopa, 2001). Debt issuances, however, have inconclusive predictions regarding the stock price response. On the one hand, debt issuances lead to a transfer of wealth from firms' bondholders to firms' stockholders, as a positive stock price response is predicted (Black and Scholes, 1973). Further, debt issuances are costly signals of managers to inform the market about the high quality of the firms that a positive stock price response is expected (Ross, 1977). On the other hand, debt issuances convey bad news about future cash flow and earnings of the firms, that will be perceived negatively by the stock market (Miller and Rock, 1985; Dann and Mikkilson, 1984; Eckbo, 1986; Mikkelson and Partch, 1986; Fama and French, 1998). The evidence of cash flows information indicates a positive association between stock returns and unexpected net cash flows from financing (Livnat and Zarowin, 1990; Clubb, 1995; Garrod and Hadi, 1998). For evidence from the SET, the stock issuances are consistent with stock price decreases (Intuthipawan, 2000; Jarukitsopa, 2001) which suggest a negative association between stock returns and cash flows from stock issues. In contrast, Kanokporn Narktubtee (2000) shows a positive association between stock prices and net cash flows from financing. Overall financing might be subject to the proportion between debt and equity or subject to the contextual effect such as growth

opportunities of firms. Nevertheless, according to the results of Kanokporn Narktubtee (2000), that reveals the favorable reaction to overall financing of firms in the SET, I predict a positive association of CFF and CAR or that β_4^1 has a positive sign.

3.5.2 The impact of transitory of earnings on the incremental information content of cash flow beyond earnings

According to equation (13), I allow a dummy variable to stand for two stages of the transitory of earnings in order to test its impact on the stock market reaction to earnings and cash flows. The regression model used to test this impact is written as follows;

$$CAR_{it} = \beta_0^2 + \beta_1^2 * D_{ET} + \beta_2^2 UE_{it} + \beta_3^2 UCFO_{it} + \beta_4^2 UCFI_{it} + \beta_5^2 UCFF_{it} + \beta_6^2 UE_{it} * D_{ET} + \beta_7^2 UCFO_{it} * D_{ET} + \beta_8^2 UCFI_{it} * D_{ET} + \beta_9^2 UCFF_{it} * D_{ET} + \varepsilon_{it} \quad \text{(T-2)}$$

where: D_{ET} = a dummy variable which takes a value of 1 for high transitory of earnings and

0 otherwise

The transitory of earnings hypothesis can be supported if β_6^2 has a negative sing and β_7^2 has a positive sign. The CFI and CFF play a role of alternative information in order to predict a firm' s future cash flows. Lips (1990) indicated that alternative information mitigates the return-earnings relationship. Therefore, when earnings have high transitory the investors might rely on the other relevant information than when earnings have low transitory. CFI and CFF should play a larger role of additional relevant information in the existence of high transitory of earnings. For this expectation, I predict that β_8^2 has a negative sign and β_9^2 has a positive sign.

3.5.3 The impact of firm types on the incremental information content of cash flow beyond earnings

I classify firm types into growth stocks and value stocks by the market-to-book, value as discussed in section 2.3.2.2. The following model is used to test the effect of firm types on the relationship of returns and earnings and cash flows.

$$CAR_{it} = \beta_0^3 + \beta_1^3 * D_{TP} + \beta_2^3 UE_{it} + \beta_3^3 UCFO_{it} + \beta_4^3 UCFI_{it} + \beta_5^3 UCFF + \beta_6^3 UE_{it} * D_{TP} + \beta_7^3 UCFO_{it} * D_{TP} + \beta_8^3 UCFI_{it} * D_{TP} + \beta_9^3 UCFF_{it} * D_{TP} + \varepsilon_{it} \quad \text{(T-3)}$$

where:

D_{TP} = dummy variable takes a value of 1 for growth stock and 0 otherwise

For the growth stocks, there could be the existence of high persistent earnings while low persistent CFO. That is because these firms have increases in sales and are typically concurrent with an increase in receivables. As a result, operating cash flows lag sales. Further, as sales increase, the firm purchases additional inventory in order to support the expected future sales, but the inventory cost is recorded (in accrual basis accounting) when goods are sold. Thus, the cash outflow for inventory leads the cost of goods sold. However, the increases in payables and accrued liabilities typically coincide with increased sales, which, therefore, partially offset the increases in current assets and reduce the lag between CFO and earnings. Anyway, those effects of the increase in sales have different magnitudes, as current assets are likely to grow more rapidly than current liabilities for supporting the rapid future growth (Ingram and Lee, 1997). As a result, CFO

highly fluctuates period relative to earnings during growth periods. Further, the growth stocks imply that firm values consist of high growth opportunities (Myers, 1977), that might include intangible assets; for example, patents, good will that are disposed or amortized through the accrual accounting but not for cash accounting. So, CFO might not be a good proxy for the future cash flows of these firms due to the limitation of timing and matching of the cash basis. In contrast, the firm's value of the value stocks consists of assets in place rather than growth opportunities. CFO might be a good proxy for future cash flows since the timing and matching problems are not severe. Hence, CFO might play a role of alternative information to provide higher incremental informativeness to earnings in value stocks than growth stocks. Therefore, I expect that CFO conveys higher additional information about future cash flows in the value stocks than the growth stocks or that β_7^3 has a negative sign. Also I predict that earnings should have superior additional information content beyond cash flows in growth stocks than value stocks, i.e. β_6^3 should have a positive sign.

CFI provides information about future cash flows that will be generated by new investments. While earnings and CFO provide information about future cash flows of firms that will be generated from assets in place, CFI, thus, could contain information useful for setting stock prices incremented to earnings and CFO. However, if firms are making new investments in growth opportunities, the projects are expected to have positive net present value while if managers do not act in the best interests of shareholders but act for their self interests, the new investments would be negative net present value projects

(Amihud and Lev, 1981; Berger and Ofek, 1995; Charoenwong et al., 2001). The market might interpret new investments signals regarding firms' growth opportunities. If the market is aware of firms' growth opportunities, it should response to the higher-than-expected investment announcements of the good growth opportunity firms with a positive sign, while responding with negative sign for bad growth opportunity firms (John and Mishra, 1990; Anthony and Ramesh, 1992). By assuming that the market knows the firms' growth opportunities (Lakonishok et al., 1994), I expect that the stock price responses for higher-than-expected CFI of growth stocks will be more positive than value stocks, and vice versa for lower-than-expected CFI. As a result, I predict that β_8^3 has a negative sign.

CFF reveals the ability of firms to obtain additional funds and the obligations that the firms need to pay cash for recovering interests, principals, or dividends in the future. For the growth stocks, firms are growing in sales and assets (Lakonishok et al., 1994), and those firms typically need to finance additional funds. Hence, an increase in CFF would be positively reacted by the market. In contrast, for the value stocks, where the market perceives that they have low growth opportunities will be less positively reacted by the market for increases in CFF, because it reveals that the firms have more obligations to recover by cash. Consequently, if the firms cannot generate cash enough to recover, those firms will get in financial distress. Since the low growth opportunity firms have higher risk

in cash generating ability than high growth opportunity firms, the market should react more favorable to increases in financing of the growth stocks than the value stocks that is indicated by a positive sign of β_9^3.

3.5.4 The impact of CFI/CFF ratio on the incremental information content of cash flow beyond earnings

The impact of CFI/CFF ratio is tested by allowing a dummy variable of equation (13) for a value of CFI/CFF ratio, due to its economic interpretation as discussed above. The regression model using to test this impact is as follows:

$$CAR_{it} = \beta_0^4 + \beta_1^4 * D_{CFICFF} + \beta_2^4 UE_{it} + \beta_3^4 UCFO_{it} + \beta_4^4 UCFI_{it} + \beta_5^4 UCFF + \beta_6^4 UE_{it} * D_{CFICFF} + \beta_7^4 UCFO_{it} * D_{CFICFF} + \beta_8^4 UCFI_{it} * D_{CFICFF} + \beta_9^4 UCFF_{it} * D_{CFICFF} + \varepsilon_{it} \quad \text{(T-4)}$$

where, D_{CFICFF} = dummy variable which takes a value of 1 for firms that have CFI/CFF ratio excess 1, and 0 for a ratio less than 1

The CFI/CFF ratio represents the sources of funds used for investments during a period. A ratio in excess of 1 (CFI>CFF), implies that the investments of the period have been financed by internal sources rather than external sources of funds. In contrast, a ratio less than 1 (CFF>CFI) reveals that the company has used a part of their funds from external financing in non-investing activities. Thus, the ratio larger than 1 (less than 1) indicate the relatively higher (lower) capital flexibility and the better (worse) managing of sources and uses of funds. As a result, the firms with the ratio excess of 1 might be perceived as the better companies comparative to the firms with the ratio less than 1.

These economic interpretations of the CFI/CFF ratio might convey relevant information to the market in order to interpret the information of individual CFI and CFF as well as earnings and CFO. I expect that β_6^4 should take a positive sign due to the better (worse) management of funds. In the case of the firms with the ratio less than 1, CFO should be more positively reacted by the market relative to the firms with the ratio excess of 1 due to the lack of capital flexibility that the firms need to generate CFO in order to avoid the financial distress if some unexpected events occur. Hence, I expect that β_7^4 has a negative sign. The investment funding by internal sources of funds should have a more favorable reaction by the market than the external funding, i.e. β_8^4 is expect to have a negative sign. Further, the market might favor the using of funds from financing activities in investment activities more than in other activities. So, I expect that β_9^4 has a positive sign.

3.5.5 Joint impacts of the determinants of incremental information content of cash flows beyond earnings

The joint impacts are investigated in this study by adding multiplicative terms regarding the interaction between the two and three qualitative (dummy) variables. As a result, four models are formulated by adding interaction dummies (multiplicative of the two variables). The first three models are used to analyze the interaction effect of a pair factor; models T-5 for the joint impacts of transitory of earnings and types of stock, T-6 for the joint impacts of earnings transitory and CFI/CFF ratio, and T-7 for the joint impacts

between types of stock and CFI/CFF ratio. The last model (T-8) is used for the test of interaction effects of all three factors. These models are presented as follows.

$$
\begin{aligned}
CAR_{it} &= \beta_0^5 + \beta_1^5 * D_{ET} + \beta_2^5 D_{TP} + \beta_3^5 D_{ET} D_{TP} \\
&+ \beta_4^5 UE_{it} + \beta_5^5 UCFO_{it} + \beta_6^5 UCFI_{it} + \beta_7^5 UCFF_{it} \\
&+ \beta_8^5 UE_{it} * D_{ET} + \beta_9^5 UCFO_{it} * D_{ET} + \beta_{10}^5 UCFI_{it} * D_{ET} + \beta_{11}^5 UCFF_{it} * D_{ET} \\
&+ \beta_{12}^5 UE_{it} * D_{TP} + \beta_{13}^5 UCFO_{it} * D_{TP} + \beta_{14}^5 UCFI_{it} * D_{TP} + \beta_{15}^5 UCFF_{it} * D_{TP} \\
&+ \beta_{16}^5 UE_{it} * D_{ET} D_{TP} + \beta_{17}^5 UCFO_{it} * D_{ET} D_{TP} \\
&+ \beta_{18}^5 UCFI_{it} * D_{ET} D_{TP} + \beta_{19}^5 UCFF_{it} * D_{ET} D_{TP} + \varepsilon_{it}
\end{aligned}
\qquad \text{(T-5)}
$$

Where, all variables are denoted as previously. As a result, β_{16}^5, β_{17}^5, β_{18}^5, and β_{19}^5 are the differential effects of being a growth firm with high transitory of earnings.

$$
\begin{aligned}
CAR_{it} &= \beta_0^6 + \beta_1^6 * D_{ET} + \beta_2^6 D_{TP} + \beta_3^6 D_{ET} D_{TP} \\
&+ \beta_4^6 UE_{it} + \beta_5^6 UCFO_{it} + \beta_6^6 UCFI_{it} + \beta_7^6 UCFF_{it} \\
&+ \beta_8^6 UE_{it} * D_{ET} + \beta_9^6 UCFO_{it} * D_{ET} + \beta_{10}^6 UCFI_{it} * D_{ET} + \beta_{11}^6 UCFF_{it} * D_{ET} \\
&+ \beta_{12}^6 UE_{it} * D_{CFICFF} + \beta_{13}^6 UCFO_{it} * D_{CFICFF} + \beta_{14}^6 UCFI_{it} * D_{CFICFF} \\
&+ \beta_{15}^6 UCFF_{it} * D_{CFICFF} + \beta_{16}^6 UE_{it} * D_{ET} D_{CFICFF} + \beta_{17}^6 UCFO_{it} * D_{ET} D_{CFICFF} \\
&+ \beta_{18}^6 UCFI_{it} * D_{ET} D_{CFICFF} + \beta_{19}^6 UCFF_{it} * D_{ET} D_{CFICFF} + \varepsilon_{it}
\end{aligned}
\qquad \text{(T-6)}
$$

Where, all variables are denoted as before. Coefficients β_{16}^6, β_{17}^6, β_{18}^6, and β_{19}^6 are the differential effects of being a firm with high earnings transitory and the ratio of CFI/CFF is excess one.

$$
\begin{aligned}
CAR_{it} &= \beta_0^7 + \beta_1^7 * D_{TP} + \beta_2^7 D_{CFICFF} + \beta_3^7 D_{TP} D_{CFICFF} \\
&+ \beta_4^7 UE_{it} + \beta_5^7 UCFO_{it} + \beta_6^7 UCFI_{it} + \beta_7^7 UCFF_{it} \\
&+ \beta_8^7 UE_{it} * D_{TP} + \beta_9^7 UCFO_{it} * D_{TP} + \beta_{10}^7 UCFI_{it} * D_{TP} + \beta_{11}^7 UCFF_{it} * D_{TP} \\
&+ \beta_{12}^7 UE_{it} * D_{CFICFF} + \beta_{13}^7 UCFO_{it} * D_{CFICFF} + \beta_{14}^7 UCFI_{it} * D_{CFICFF} + \beta_{15}^7 UCFF_{it} * D_{CFICFF} \\
&+ \beta_{16}^7 UE_{it} * D_{TP} D_{CFICFF} + \beta_{17}^7 UCFO_{it} * D_{TP} D_{CFICFF} \\
&+ \beta_{18}^7 UCFI_{it} * D_{TP} D_{CFICFF} + \beta_{19}^7 UCFF * D_{TP} D_{CFICFF} + \varepsilon_{it}
\end{aligned}
\qquad \text{(T-7)}
$$

Where, all variables are denoted as previously. Coefficients β_{16}^7, β_{17}^7, β_{18}^7, and β_{19}^7 are the differential effects of being a growth firm with CFI/CFF ratio excess one.

$$
\begin{aligned}
CAR_{it} &= \beta_0^8 + \beta_1^8 D_{ET} + \beta_2^8 D_{TP} + \beta_3^8 D_{CFICFF} + \beta_4^8 D_{ET} D_{TP} D_{CFICFF} \\
&+ \beta_5^8 UE_{it} + \beta_6^8 UCFQ_{it} + \beta_7^8 UCFI_{it} + \beta_8^8 UCFF_{it} \\
&+ \beta_9^8 UE_{it} * D_{ET} + \beta_{10}^8 UCFQ_{it} * D_{ET} + \beta_{11}^8 UCFI_{it} * D_{ET} + \beta_{12}^8 UCFF_{it} * D_{ET} \\
&+ \beta_{13}^8 UE_{it} * D_{TP} + \beta_{14}^8 UCFQ_{it} * D_{TP} + \beta_{15}^8 UCFI_{it} * D_{TP} + \beta_{16}^8 UCFF_{it} * D_{TP} \\
&+ \beta_{17}^8 UE_{it} * D_{CFICFF} + \beta_{18}^8 UCFQ_{it} * D_{CFICFF} + \beta_{19}^8 UCFI_{it} * D_{CFICFF} + \beta_{20}^8 UCFF_{it} * D_{CFICFF} \\
&+ \beta_{21}^8 UE_{it} * D_{ET} D_{TP} D_{CFICFF} + \beta_{22}^8 UCFQ_{it} * D_{ET} D_{TP} D_{CFICFF} \\
&+ \beta_{23}^8 UCFI_{it} * D_{ET} D_{TP} D_{CFICFF} + \beta_{24}^8 UCFF_{it} * D_{ET} D_{TP} D_{CFICFF} + \varepsilon_{it}
\end{aligned}
\qquad \text{(T-8)}
$$

Where, all variables are denoted as above. Coefficients β_{21}^8, β_{22}^8, β_{23}^8, and β_{24}^8 are the differential effects of being a growth firm with high transitory of earnings and the ratio of CFI/CFF is excess one.