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ACCOUNTING FUNDAMENTALS AND VARIATIONS OF STOCK PRICE: FORWARD LOOKING INFORMATION INDUCEMENT

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ABSTRACT

This study investigates a permanent issue about low association between accounting fundamentals and variations of stock prices. It induces not only historical accounting fundamentals, but also forward looking information. Investors consider forward looking information that enables them to predict potential future cash flow, increase predictive power, lessen mispricing error, increase information content and drives future price equilibrium. The accounting fundamentals are earnings yield, book value, profitability, growth opportunities and discount rate or they could be called as five-related-cash flow factors. The forward looking information are expected earnings and expected growth opportunities. This study suggests that model inducing forward looking information could improve association degree between accounting fundamentals and the movements of stock prices. In other words, they have higher value relevance than not by inducing. Finally, this study concludes that inducing forward looking information could predict stock price accurately and reduce stock price deviations from their fundamental value. It also implies that trading strategies should realize to firm's future rational expectations.

Keywords*: earnings yield, book value, profitability, growth opportunities, discount rate, accounting fundamentals, forward looking, value relevance*

INTRODUCTION

Permanent issue in accounting is the relationship between accounting information and stock price movements. It is triggered by the objectives of financial reporting (FASB, 1978) stated that financial reporting must presents information for both investors and potential investors to estimate future cash flow. Consequently, it requires close association between fundamental firm value and its changes with stock price variations. The objective of this study is to evaluate this association by designing new better model, especially to estimate the value relevance of firms' fundamental value.

Chen and Zhang (2007) present theory and empirical evidences that stock return is a function of accounting fundamentals. They indicate that firm equity value contains future potential earnings and growth opportunities. Lev (1989), Lo and Lys (2000), and Kothari (2001) have studied the association between stock return and fundamental accounting information and found that it is contradictory.

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They denote that the inconsistent association due to (1) weak relationship between earnings and stock price variations, represented by *adj-*R^2 less than 10% (Chen and Zhang, 2007), and (2) linearity relationship between accounting information and future cash flow, with scalability of equity capital investment (Ohlson, 1995, Feltham and Ohlson, 1995, 1996, Zhang, 2000, and Chen and Zhang, 2007).

This study focuses on designing new return model by inducing forward looking information to improve association degree between accounting fundamentals and stock price variations. Zhang (2000) and Chen and Zhang (2007) models include historical accounting data or backward looking perspective. Based on that model, this study induces expected future earnings yield and growth opportunities or has forward looking information. It has some advantages. They are able to achieve value optimization (Shaw, 2007), give superiority to future information (Lee and Yan, 2003), improve model accuracy (Chen, Yee, and Yoo, 2004), reduce future uncertainty (Giannnoni, 2008), and reduce stock price fluctuation (Brock, Dindo, and Hommes, 2006). This study is different from Copeland et al. (2004), and Liu and Thomas (2000). Both studies focus on expected future earnings only. Meanwhile, it is also different from Weiss, Naik and Tsai (2008) that induce short-run asset capacity.

This study investigates return model by employing several capital markets that are Asia, Australia and US countries. Although all these countries are not comparable in economic progress and capital market efficiency form, this study blends them. This blending is based upon market-wide regime shifting behavior concept (Ho and Sequeira, 2007). This concept recommends that the association between accounting fundamentals and stock price movements is only based on earnings and firm book value. It also suggests that highly stock price movement respons to highly earnings level and vice versa. It could be concluded that this reaction do not consider market efficiency form.

This study is based on two assumptions. Firstly, stock markets in selected countries are within comparable efficiency level. Stock price variations at all stock markets acts in the same market-wide regime behavior and depends on equity book value and earnings (Ho and Sequeira, 2007). Secondly, cost of interest represents opportunity cost for each firm. It describes that every fund was managed in order to maximize assets usability. This refers to that management always behaves rationally.

Research Objectives

The main objective of this study is to construct new return model and examine it to obtain better association degree. It also investigates consistent direction of each construct association within the return model. The new return model induces forward looking information which is not potential expected earnings (Weiss, Naik and Tsai, 2008) or multiple earnings only (Liu, Nissim and Thomas, 2001), but it also induces both of expected future earnings and growth opportunities. Finally, this study examines previously designed model and compares with the new one.

Research Contribution

This study contributes to accounting literature to create new return model that is expected to be more comprehensive, realistic, accurate and better association degree. This study has advantages compared to the models of Easton and Harris (1991), Liu and Thomas (2000), Zhang (2000), Copeland et al. (2004), Chen and Zhang (2007), and Weiss, Naik and Tsai (2008) as follows. *First*, this study is more comprehensive by including a set of rational expected accounting information. It means that the return function does not merely rely on accounting data reported on financial statements.

Second, by inducing forward looking information, this model is expected to be more realistic and closer to economic perspective. It means that, in accordance with forward looking theory, the firm should make rational decision to manage its assets to generate future cash flow. The firm must choose future investments which give positive contribution to future cash flow. Future cash flow affects earnings and its change. It refers to earnings capitalization model. *Third*, this new model becomes more accurate and better instrument to predict future cash flow. It is useful for investors to estimate future potential gains by extracting forward looking information (Weiss, Naik and Tsai, 2008). Its accuracy is supported by multiple value drivers (Liu, Nissim and Thomas, 2001). Multiple value drivers increase model accuracy as long as they have information synchronicity to increase value relevance. *Last*, this study has valuable contribution by creating new return model with higher association degree. It is showed by *adj-*R^2 which is higher than previous models.

Research Benefits

This study is beneficial to investors and managements. From investor's point of view, this study offers more accurate, comprehensive parameter to predict future cash flow (SFAC No. 1, FASB, 1978). This is related to the relationship of fundamental accounting data and its change with stock price. Accounting information becomes more useful when presented in financial statements (SFAC No. 5, para. 24, FASB, 1984).

From management's point of view, this study gives more incentive for managements to manage more rationally their future investments giving positive contribution to firm equity value. Managements and investors should perceive closely the association between accounting information and stock price. From accounting literature point of view, this study becomes a trigger to further studies, especially to develop new models to achieve higher degree of association.

The remaining manuscript is organized as follows. Section 2 describes the development of theoretical return model and hypothesis for each model. Section 3 illustrates empirical research design and research methods. Section 4 discusses the results of empirical examinations. And section 5 depicts research conclusions, limitations and consequences for further studies.

LITERATURE REVIEW, MODEL AND HYPOTHESES DEVELOPMENT

Earnings Yield and Book value

Model that associates earnings and book value with stock market value or return is developed on classical concepts basis. The point is the usage of accounting information to evaluate firm equity value, market efficiency, and forecasting analysis. This concept refers to Ohlson (1995). This model formulates that firm equity value comes from book value and expected value of future residual earnings. The expected value can be calculated from current discounted value of potential assets. Every new wealth acquired comes from invested assets and being reflected in firm book value. Then, firm book value is reflected in stock price.

Model of Ohlson (1995) indicates linear information dynamic between book value and expected residual earnings with stock price. This model is followed by next studies. Lo and Lys (2000), and Myers (1999) for the first time implemented clean surplus theory. It outlines that end year book value equals to beginning year book value added by current year earnings and subtracted dividend paid. Model of Lundholm (1995) formulates that firm market value equals to equity capital invested plus discounted future residual earnings.

Further studies use Ohlson (1995) and Lundholm (1995) concepts to evaluate firm

equity value and to determine either earnings or firm market value. Lo and Lys (2000) offer new hypothetical concepts that firm equity value is a function of discounted future earnings and dividend. Dechow, Hutton, and Sloan (1999) evaluate capital rate of return based on residual earnings, while Frankel and Lee (1999) add investors expectation of minimum profitability. Beaver (1999), Hand (2001), and Myers (1999) confirm that firm market value is a function of book value and earnings, in accordance with concept of Ohlson (1995). However, the three researches recommend other information to increase association degree of return model. Ohlson (2001) criticize his former concept by describing other information to increase degree of association between book value and earnings with firm market value. Danielson and Dowdell (2001) and Aboody, Hughes and Liu (2001) specify the other information with growth rate and reasonable expectation of future earnings.

Other studies constantly use model of Ohlson (1995) without criticizing book value and earnings within the model. Feltham and Ohlson (1995; 1996) emphasize that the association between book value and earnings is asymptotic; it may be affected by other information and conservatism in depreciation. Burgstahler and Dichev (1997), under the same model, add concept of assets book value and liabilities to explain firm market value better. Liu and Thomas (2000), and Liu, Nissim and Thomas (2001) add multiple factors into clean surplus model, either earnings dis-aggregation or other book value and earnings related measures.

Collins, Maydew, and Weiss (1997), Lev and Zarowin (1999), and Francis and Schipper (1999) outline that value relevance between book value and earnings with stock market value or return may be preserved. Abarbanell and Bushee (1997) and Penmann (1998) specifically that more accounting information result in better degree of association. Both studies earnings quality improve degree of association. Collins, Pincus, and Xie (1999) argue similarly and confirm the association between book value and earnings with stock market value by eliminating losing firms.

Bradshaw, Richardson and Sloan (2006) modify clean surplus model by adding future financing activity. Cohen and Lys (2006) and Weiss, Naik and Tsai (2008) add expected value of future potential earnings into return model. Chen and Zhang (2007) modify their model without discarding book value and earnings. This research, in order to increase degree of association, adds external environment factors which may multiply degree of association.

Past researches have correlated book value and earnings with firm market value. Rao and Litzenberger (1971), and Litzenberger and Rao (1972) formulate that firm market value is a function of book value and earnings and adjustable to liabilities and productivity growth. Bao and Bao (1989) indicate that firm equity value is not merely affected by earning, but also by expected earnings, earnings standard deviation and earnings growth. Beaver, Lambert and Morse (1980), Collins, Kothari and Rayburn (1987), Easton and Harris (1991) conclude that book value and earnings have better degree of association when the earnings are ranked. Earnings and their changes are deflated by stock market value. Warfield and Wild (1992) examine further than Easton and Harris (1991) and replace the deflating factor with previous year stock market value.

Forward Looking Information

Forward looking information means that refinements increase the information content of financial and nonfinancial performance measures regarding future financial performance (Dikkoli and Sedatole, 2007). Inducing forward looking information is based on rational expectation hypothesis. Within return model context, the essence of this hypothesis is the expected value of one or more

accounting information which are comparable within a set of information (Heijdra and Ploeg, 2002). The benefit and objective is to obtain more effective information set for decision making. It is a more universal instrument to investigate the implications of new policies for it measures asymptotic variance. The value relevance can be either in short-term or long-term.

Another advantage of forward looking information is its transparency and predictive power (Zarb, 2007; Fay, 2009). Shaw (2007) indicates that forward looking information is able to predict cash inflow and potential future cash flow better than backward looking information. Therefore, it can be used for forecasting and maximizing technique. Beretta and Bozzolan (2006), and Chen, Yee and Yoo (2004) conclude that inducing forward looking information increase predictive power and lessen forecasting error. Dikolli and Sedatole (2007) conclude that forward looking information of non-main earnings increase information content. Moreover, it brings better indicator for decision making. Giannoni and Woodford (2007) state that forward looking information makes forecasting more efficient within longer period and predict clearly future benefits. Brock, Dindo, and Hommes (2006) conclude that forward looking information drives price equilibrium in the future. Within return model context, it makes return model achieve equilibrium state.

The mapping of accounting researches gives concept to anticipate future reasonable expected values. Beaver, Lambert and Morse (1980) initiate that their research include future earnings change into return model. This study is supported by Lev and Thiagarajan (1993), Abarbanell and Bushee (1997), Brown, Foster, and Noreen (1985), and Cornell and Landsman (1989). Easton and Harris (1991) also perform similar study, with future expected return is deflated by previous year stock price as predictor in return model. Liu and Thomas (2000) give solution that future earnings and earning shock improve association degree of return model. This model offers more effective model and decrease specifying errors.

Copeland, et al. (2004) confirms that reasonable future expected earnings improve return model. Chen and Zhang (2007) specify that expected earnings, expected future growth rate, and expected discount rate change improve association degree of return model. Weiss, Naik and Tsai (2008) design their own return model by including forward looking information of short-term investment capacity. This study gives stronger degree of association. Forward looking information included into this model consists of future account receivables, future inventory, future profit margin, and future cost of good sold. It can be concluded that inducing reasonable expected future values improves return model.

Change in Growth Opportunities

Growth opportunities are included into return model according to model of Ohlson (1995). This model complies to clean surplus theory, with premises as follows. (i) Stock market value is based on discounted dividend in which investors take neutral position against risks. (ii) accounting income is pre-deterministic value. (iii) In addition, future earnings are stochastic. Future earnings can be calculated by previous consecutive earnings. However, investors may have different respond against minimum or maximum profitability. Therefore, growth opportunities affect earnings or future potential earnings.

Rao and Litzenberger (1971), Litzenberger and Rao (1972), and Bao and Bao (1972) conclude that growth rate and its change improve firm competitiveness. Higher efficiency increases productivity, higher productivity increases stockholders wealth and country. Rao and Litzenberger (1971) and Litzenberger and Rao (1972) disclose that growth opportunities are related directly with long-run prospect. Those researches are based

on concept of Miller and Modigliani (1961) who concluded that a growing firm is firm with positive capital rate of return. It also means that each asset has lower interest rate than cost of capital.

Liu, Nissim and Thomas (2001), Aboody, Hughes and Liu (2002), and Frankel and Lee (1998) mention that firm intrinsic value is determined by growth and future potential growth. Current growth drives the movement of future residual earnings, while future growth lessens return model errors by improving association degree of return model. Lev and Thiagarajan (1993), Abarbanell and Bushee (1997), and Weiss, Naik and Tsai (2008) indicate that changes in inventory, gross profit, sales, account receivables and the others improve future potential growth of earnings. Growth also improves firm equity value. The study concluded that stock market value is adjustable to that firm's growth. Danielson and Dowdell (2001) confirm that growing firm has better operation efficiency. Growing firm always has ratio between stock price and book value greater than one. However, investors do not perceive stock return of growing firm higher than those of diminishing firm.

Chen and Zhang (2007) conclude that firm equity value depends on growth opportunities. Growth opportunities are a function of scaled investment and affects future potential growth. The inducement of growth opportunities argues that earnings elements alone are not sufficient to explain. The explanation becomes more comprehensive when external environment, industry and interest rate are included to determine earnings and future earnings.

Change in Discount Rate

Change in discount rate concept is based on model of Ohlson (1995) simplification. This model assumes that investors take neutral position against fixed risks and interest rate. The simplification is modified by Feltham and Ohlson (1995; 1996), and Baginski and Wahlen (2000) by inducing interest rate because it affects short-term and long-term earnings power. Change of interest rate also affects investor's perception about earnings power, because interest rate provides certainty of future earnings.

Rao and Litzenberger (1971), and Litzenberger and Rao (1972) posit that firm equity value depends on discounted value of future earnings. This value is affected by pure interest rate. Interest rate changes operation efficiency. Operation efficiency alters earnings. Danielson and Dowdell (2001), and Liu, Nissim and Thomas (2001) state that discount rate modifies firm equity value for it changes the growth of assets and capital book value. If weighted interest rate of assets and capital was higher than pure interest rate, the firm may generate earnings. Obtaining new debts or capital can decrease weighted interest rate.

Burgstahler and Dichev (1997) indicate that firm equity value can be increased according to adaptation theory by modifying interest rate, for instance obtaining alternative investment with lower interest rate. Aboody, Hughes and Liu (2002), Frankel and Lee (1998), Zhang (2000) and Chen and Zhang (2007) argue that earnings growth is determined by interest rate. Interest rate serves as adjustment factor for firm operation, by selecting favorable interest rate to make efficient operation.

Model of Equity Value

Earnings play important role to show the firm tendency to grow or to terminate its operation. Valuation model measures the creation of equity capital investment on continuation or termination of firm operation framework (Burgstahler and Dichev, 1997). Equity value model developed by Zhang (2000) and Chen and Zhang (2007) is described as follows.

With V_t is firm equity value financed during period t (end period t), X_t is earnings

during period t, B_t is equity book value, $E_t(X_{t+1})$ is future expected earnings, k is earnings capitalization factor, P is probability of operation termination, C is probability of operation continuation, $q_t \equiv X_t/B_{t-1}$ is profitability, based on ROE, period t. and g_t is growth opportunities, Chen and Zhang (2007) formulate equity value as follows.

$$V_t = kE_t(X_{t+1}) + B_t.P(q_t) + B_t.g_t.C(q_t) \quad (1)$$

This model (1) formulates that equity value (V_t) is correlated with future expected earnings ($E_t(X_{t+1})$), future earnings capitalization factor (k), probability to terminate operation ($P(q_t)$), and probability to continue operation ($C(q_t)$). It indicates that equity value is equal to current operation (q_t) added by growth value which can be positive or negative (g_t). It also indicates that when v increased, then g_t increase along with invested assets. Increase of v makes discount rate r_t to fall which indicates easier future cash flow. Therefore, firms with g_t increase and r_t decrease are firms those are able to generate earnings.

Model of Stock Return with Inducing Forward Looking Information

Using model (1) as basis, forward looking model for expected earnings is as follows.

$$R_t = \left[\frac{X_t}{V_{t-1}}\right] + \left[\frac{EX_{t+1}}{V_t}\right] + \left[\left(1 - \frac{B_t}{V_{t-1}}\right)\frac{\Delta B_t}{B_{t-1}}\right] + (C)\left[\frac{B_{t-1}}{V_{t-1}}\Delta g_t\right] + v_3\left[\frac{B_{t-1}}{V_{t-1}}\Delta r_t\right] \quad (2)$$

The next is inducing forward looking information of expected profitability into model (3) to obtain model (3) as follows.

$$R_t = \left[\frac{X_t}{V_{t-1}}\right] + \left[\frac{EX_{t+1}}{V_t}\right] + \left[\left(1 - \frac{B_t}{V_{t-1}}\right)\frac{\Delta B_t}{B_{t-1}}\right] + (C)\left[\frac{B_{t-1}}{V_{t-1}}\Delta g_t\right] + (C)\left[\frac{B_t}{V_t}\Delta Eg_{t+1}\right] + v_3\left[\frac{B_{t-1}}{V_{t-1}}\Delta r_t\right] \quad (3)$$

Equation (3) infers that stock return is a function of the following factors: (1) earnings yield (X_t/V_{t-1}), (2) expected earnings (EX_{t+1}/V_t), (3) change in equity capital ($\Delta B_t/B_{t-1}$), (4) change in growth opportunities (Δg_t), (5) change in expected growth opportunities (ΔEg_{t+1}), and (6) change in discount rate (Δr_t). Up to this stage, model was developed incrementally, forward looking variables are included into model one by one. Though, actually it can be done mutually exclusive.

Hypothesis Development

Earnings Yield Earnings yields (X_t) show the value generated from beginning year capital. Earnings yield is deflated by the opening value of current equity capital which generates current earnings. According to model (3), if earnings yields increased, stock return increases and vice versa. Therefore, it be concluded that earnings yield associates with stock price positively (Rao and Litzenberger, 1971; Litzenberger and Rao, 1972; Bao and Bao, 1989; Burgstahler and Dichev, 1997; Collins, Pincus and Xie, 1999; Collins, Kothari and Rayburn, 1987; Cohen and Lys, 2006; Liu and Thomas, 2000; Liu, Nissim and Thomas, 2001; Weiss, Naik and Tsai, 2008; Chen and Zhang, 2007; Ohlson, 1995; Feltham and Ohlson, 1995; Feltham and Ohlson, 1996; Bradshaw, Richardson and Sloan, 2006; Abarbanell and Bushee, 1997; Lev and Thiagarajan, 1993; Penman, 1998; Francis and Schipper, 1999; Danielson and Dowdell, 2001; Aboody, Hughes and Liu, 2001; Easton and Harris, 1991; and Warfield and Wild, 1992).

Using mathematical properties from equation (3), the association between earnings yields (X_t/V_{t-1}) and stock return (R_t) should be positive. It is caused by $\frac{dR_t}{dX_t} = \frac{1}{V_{t-1}}$, and $1/V_{t-1}$ that is always greater than zero, then dR_t/dX_t is always positive. Therefore, my alternative hypothesis is stated as follows.

H_{A1}: Earnings yield associates positively with stock return

Expected Earnings Similar to earnings yield, expected earnings (EX_{t+1}) shows value which is expected to be generated in the future from end year capital. Expected earnings are normalized by closing value of current capital, so that potential future earnings growth is shown. Inducing expected earnings is based on forward looking concept which states that reasonable future expected earnings influences positively the movement of stock price or certain measure (Burgstahler and Dichev, 1997; Cohen and Lys, 2006; Weiss, Naik and Tsai, 2008; Chen and Zhang, 2007; Ohlson, 1995; Feltham and Ohlson, 1995; Feltham and Ohlson, 1996; and Aboody, Hughes and Liu, 2001).

The influent mechanism is equal to earnings yield, so that the association between expected earnings (EX_{t+1}/V_t) and stock return is positive. It is also caused by $\frac{dR_t}{dEX_{t+1}} = \frac{1}{V_t}$, and $1/V_t$ that is expected to greater than zero, then dR_t/dEX_{t+1} is always positive. We summarize alternative hypothesis statement as follows.

H_{A2}: The change in expected earnings yield associates positively with stock return

Change in Equity Capital The change in equity capital is center of firm value measurement. It is measured by $\Delta B_t/B_{t-1}$ which is change in current equity value divided by beginning value of current equity. Because of $\Delta B_t/B_{t-1}=v[\Delta B_t/V_{t-1}]$, the change of equity value increases as equity capital does, then reflected in stock return. In other words, the change of stock return is in accordance with the change of earnings after denominated by opening value of current capital (V_{t-1}). Therefore, v is always positive and greater than zero. It means that change in equity capital associates positively with stock return (Rao and Litzenberger, 1971; Litzenberger and Rao, 1972; Bao and Bao, 1989; Burgstahler and Dichev, 1997; Collins, Pincus and Xie, 1999; Collins, Kothari and Rayburn, 1987; Cohen and Lys, 2006; Liu and Thomas, 2000; Liu, Nissim and Thomas, 2001; Weiss, Naik and Tsai, 2008; Chen and Zhang, 2007; Ohlson, 1995; Feltham and Ohlson, 1995; Feltham and Ohlson, 1996; Bradshaw, Richardson and Sloan, 2006; Abarbanell and Bushee, 1997; Lev and Thiagarajan, 1993; Penman, 1998; Francis and Schipper, 1999; Danielson and Dowdell, 2001; Aboody, Hughes and Liu, 2001; Easton and Harris, 1991; and Warfield and Wild, 1992).

Using mathematical properties from equation (3), the association between change in equity capital and stock return should be positive. It is caused by $\frac{dR_t}{d\Delta B_t} = \left(1 - \frac{B_{t-1}}{V_{t-1}}\right)\frac{1}{B_{t-1}} = \frac{B_{t-1}}{B_{t-1}} - \frac{1}{V_{t-1}B_{t-1}}$, and with B_{t-1}/B_{t-1} greater than $1/(V_{t-1}B_{t-1})$, then dR_t/dB_t should be positive and greater than zero. It is summarized as alternative hypothesis as follows.

H_{A3}: Change in equity capital associates positively with stock return

Change in Growth Opportunities Future equity value depends on change in growth opportunities (Δg_t). Stock return depends on whether a firm grows or not. If a firm grown, it increases its equity value and simultaneously stock return increases. This growth concept is supported by growth adjustment process using B_{t-1}/V_{t-1}. Because of a growing firm is able to generate earnings from its invested assets. It

indicates that assets grow in different pace than equity value. Therefore, growth opportunities (Δg_t), after being adjusted by B_{t-1}/V_{t-1} associates positively with stock return (Rao and Litzenberger, 1971; Litzenberger and Rao, 1972; Bao and Bao, 1989; Weiss, Naik and Tsai, 2008; Ohlson, 1995; Abarbanell and Bushee, 1997; Lev and Thiagarajan, 1993; Danielson and Dowdell, 2001; and Aboody, Hughes and Liu, 2001). The alternative hypothesis is stated as follows.

H_{A4}: Change in growth opportunities associates positively with stock return

Change in Expected Growth Opportunities Future firm equity value is influenced by the change in expected growth opportunities (ΔEg_{t+1}). Its explanation is equal to growth opportunities. The association between change in expected growth opportunities (ΔEg_{t+1}) is also positive (Rao and Litzenberger, 1971; Litzenberger and Rao, 1972; Bao and Bao, 1989; Weiss, Naik and Tsai, 2008; Ohlson, 1995; Abarbanell and Bushee, 1997; Lev and Thiagarajan, 1993; Danielson and Dowdell, 2001; and Aboody, Hughes and Liu, 2001). Similarly, alternative hypothesis is stated as follows.

H_{A5}: Change in expected growth opportunities associates positively with stock return

Change in Discount Rate Discount rate shows future cash flow valued by cost of capital. The change in discount rate (Δr_t) affects future cash flow then modifies stock return in turn. The higher discount rate, the lower future cash flow and vice versa. It means that change in discount rate associate negatively with stock price variations (Rao and Litzenberger, 1971; Litzenberger and Rao, 1972; Burgstahler and Dichev, 1997; Liu, Nissim and Thomas, 2001; Chen and Zhang, 2007; Feltham and Ohlson, 1995; Feltham and Ohlson, 1996; Danielson and Dowdell, 2001; and Easton and Harris, 1991).

Using mathematical properties from equation (3), the coefficient of Δr_t should be negative. It is caused by $\frac{dR_t}{d\Delta r_t} = v_3 \frac{B_{t-1}}{V_{t-1}}$ with B_{t-1}/V_{t-1} greater than zero and v_3 is one positive unit of investment, but because of $r_t = \frac{1}{k}$, then $\frac{V_{t-1}}{B_{t-1}}$ should be less than zero. It is summarized in the following hypothesis statement.

H_{A6}: Change in discount rate associates negatively with stock return

RESEARCH METHOD

Population and Sample

All return-related-cash flow factors in this study (earnings yield, expected earnings yield, change in equity, and change in growth opportunities and its expected value) are obtained from financial statements. Expected data or prospectus for next year is included within notes of financial statements. All data are available at OSIRIS database. The change of discount rate data are obtained from central bank official website of each country, even though financial statements usually contain long-term debts or long term interest rate. The change of discount rate is proxies by long-term obligation interest rate from central bank of each country. Then, this study extracts stock price and return for each firm at each stock market directly.

This study covers observation targets of all Asia-Pacific and US. It denies cultural and stock market efficiency problem with concept of market-wide regime shifting behavior approach (David, 1997; Veronesi, 1999; Conrad, Cornel and Landsman, 2002; and Ho and Sequeira, 2007). It indicates that the movement of return association must be the same for each stock market and only relies on accounting information. It states that within the same certain classification, stock market

movement as respond to accounting information should be equal.

Sampling Methods

This study uses purposive sampling, the sample is obtained under certain criteria. The criteria are as follows. First, firms are in manufacture and trading sectors, eliminating financial and banking sectors. This study eliminates financial and banking sectors because they are regulated tightly. Second, opening and closing equity book value must be positive ($B_{it-1}>0$; $B_{it}>0$). Firms with negative equity book value tend to go bankruptcy. Third, accounting information and its expectation or prospectus is available. They are required for inducing forward looking information. Fourth, firm stocks are traded actively. Sleeping stocks would disturb conclusion validity.

Variables Measurement and Examination

This study designs model to improve model of Chen and Zhang (2007) by inducing forward looking information. Briefly, this study is carried out in consecutive stages as follows. First, examine using model of Chen and Zhang (2007). Second, examine by our newly developed model by inducing backward looking and forward looking information. Next, this study compares the results of both previous examinations.

The first examination is using model of Chen and Zhang (2007). It uses linear regression examination based on model as follows.

$$R_{it} = \alpha + \beta x_{it} + \gamma \Delta \hat{q}_{it} + \delta \Delta \hat{b}_{it} + \omega \Delta \hat{g}_{it} + \varphi \Delta \hat{r}_{it} + e_{it} \quad (4)$$

With R_{it} is annual stock return for firm i during period t, measured since the first day of opening year period t-1 until one day after financial statement publication or, if any, earnings announcement period t; x_{it} is earnings firm i during period t, calculated by earnings acquired by common stock holders during period t (X_{it}) divided by equity market value during opening of current period (V_{it-1}); $\Delta \hat{q}_{it} = (q_{it} - q_{it-1}) B_{it-1} / V_{it-1}$ is the change in profitability firm i during period t, deflated by equity book value during opening of current period and profitability calculated using formula $q_{it}=X_{it}/b_{it-1}$; $\Delta \hat{b}_{it} = [(B_{it} - B_{it-1}) / B_{it-1}](1 - B_{it-1} / V_{it-1})$ is equity capital or proportional change in equity book value for firm i during period t, adjusted by one minus ratio book value and market value during current period. This adjustment is needed to balance accounting book value and market value; $\Delta \hat{g}_{it} = (g_{it} - g_{it-1}) B_{it-1} / V_{it-1}$ is change in growth opportunities firm i during period t; $\Delta \hat{r}_{it} = (r_{it} - r_{it-1}) B_{it-1} / V_{it-1}$ is change in discount rate during period t; α, β, γ, δ, ω and φ are regression coefficient; and e_{it} is residual.

The second examination is inducing expected earnings, using model as follows.

$$R_{it} = \alpha + \beta X_{it} + \lambda \Delta E\hat{X}_{it+1} + \gamma \Delta \hat{q}_{it} + \delta \Delta \hat{b}_{it} + \omega \Delta \hat{g}_{it} + \varphi \Delta \hat{r}_{it} + e_{it} \quad (5)$$

With additional notes, $E\hat{X}_{it+1}$ is by expected earnings firm i during period t+1 calculated by dividing following period expected earnings (EX_{it+1}) with current period equity book value (V_t).

The third examination is inducing expected growth opportunities into model (4), so that the result is as following model.

$$R_{it} = \alpha + \beta X_{it} + \gamma \Delta \hat{q}_{it} + \delta \Delta \hat{b}_{it} + \omega \Delta \hat{g}_{it} + \pi \Delta E\hat{g}_{it+1} + \varphi \Delta \hat{r}_{it} + e_{it} \quad (6)$$

With additional notes, $\Delta E\hat{g}_{it+1}$ are expected growth opportunities for firm i during period $t+1$ measured after considering multiplier effect of growth opportunities and adjusted by ratio between book value and market value of current equity.

Until model (6) inducing forward looking variables is performed mutually exclusive. After that, all forward looking variables are induced simultaneously using model as follows.

$$R_{it} = \alpha + \beta X_{it} + \lambda \Delta E\hat{X}_{it+1} + \gamma \Delta \hat{q}_{it} + \delta \Delta \hat{b}_{it} + \omega \Delta \hat{g}_{it} + \pi \Delta E\hat{g}_{it+1} + \varphi \Delta \hat{r}_{it} + e_{it} \quad (7)$$

Linearity examination is conducted for each model. The reason is that all models are linear regression and require freedom of normality, heteroscedasticity, and multicollinearity. As Gujarati (2003) states that linear regression model must control its residual errors to prevent bias.

Sensitivity Examination

Sensitivity examination for cross-sectional data which has been examined by model (4) until (7) is performed by sample arrangement into various partitions. Partitioning criteria are ratio between equity book value and stock market value. This examination is aimed to show model consistency within various market levels. Consistency is also expected to be shown at various market changes. Our return model examines consistency against systematic risks, and not yet against idiosyncratic risks. The examination is carried out by splitting sample into quintiles or deciles according to ratio of book value and market value.

Robustness Examination

Beside sensitivity examination, this study also examines the model robustness. The objective is to infer the consistency of return model not only considering systematic risks but also idiosyncratic risks. Robustness examination employs abnormal return. Idiosyncratic risks are verified when fundamental accounting information was related to abnormal return. In other words, it also anticipates investor's overreaction against accounting information. In this study, abnormal return refers to part of abnormal return which can not be explained by main factors as explained in model of Fama and French (1992, 1993, dan 1995). This model formulates that return as a factor of ME (market equity) which is market based measurement, and BE/ME (book-to-market) which is ratio between book value and market value of each share. Therefore, model of Fama and French (1992, 1993, dan 1995) formulation is as follows.

$$R_{it} = \alpha + \beta \ln(ME)_{it} + \gamma \ln\left(\frac{BE}{ME}\right)_{it} + e_{it} \quad (8)$$

Model (8) results residual error, noted as e_{it}. It may be used as abnormal return indicator (Fama and MacBeth, 1973), and serves to examine incremental explanatory power (Chen and Zhang, 2007). It is expected to explain additional explanatory power of all independent variables in all models. Fundamental accounting information should able to explain stock price movements or has relevance value with earnings.

ANALYSIS, DISCUSSION AND FINDINGS

This section describes data analysis, discussion and research findings. It starts with descriptive statistics, analysis, discussion and ends with research findings. Descriptive statistics initiate this description.

Descriptive Statistics

This study acquires sample data as much as 6,132 (25.45%) from all population of 24,095 (100.00%). The population comes from all stock market in Asia, Australia and United States of America. The sample data period is 2009. A number of data must be excluded, the number and reason are as follows. First, 8,939 (37.10%) are due to stock price or stock return data incompleteness. Second, 661 (2.74%) are caused by earnings data unavailability. Third, 8,038 (33.36%) are due to expected earnings and growth are not presented. Fourth, 167

(0.69%) are caused by negative earnings. Fifth, 120 (0.50%) are due to extreme data exclusion. Last, 38 (0.16%) are caused by abnormal return that cannot be calculated using model of Fama and French (1992, 1993, and 1995).

Final sample has fulfilled all required criteria. This study cannot obtain firms with negative book value, because their stock price data is incomplete. Therefore, the criterion which excludes firms having negative book value is automatically accomplished. The acquired data and the exclusion are presented in Table 1 as follows.

From sample, this study analyzes to examine data initial tendency. The result of descriptive statistics is shown in Table 2. It can be inferred as follows. Return for one year period (R_{i1}) is 0.8463. then, it degrades during the following periods, for return (R_{i4}) becomes 0.0528. The decrease occurs in all level of percentile 25 (from 0.1667 to -0.2450) and percentile 75 (from 1.2500 to 0.2186). It indicates that firm market value in longer period becomes closer to its intrinsic value. With this proximity, fundamental accounting information is expected to be reflected in firm market value.

Since earnings data used in this study are earnings after tax (x_{it}), it requires firms with profit. Therefore, the minimum value is 0.0000. Mean value is 0.2092, median value is 0.0968, and standard deviation is 0.9104. The median value is in the left side of mean. It shows that there are some firms having enormous earnings. However, this condition is not a problem since its standard deviation is less than one. The return data indicates similar tendency. Therefore, the correlation between both variables is possible. The other variables, change of earnings power (Δq_{it}) and change of growth opportunities (Δg_{it}) also show similar tendency as earnings. Meanwhile, change of discount rate shows inversed tendency. Such phenomena are expected.

The change of expected earnings may move positively or negatively. Declined predicted firms show negative fluctuation. Expected earnings have minimum value of -0.2886, maximum value of 1. 8138, mean of 0.0474 and median of 0.0389. Standard deviation shows as much as 0.0612 relatively small standard error of estimate. The change of growth opportunities ($E\Delta g_{it}$) shows comparable tendency. It indicates that all expected values fluctuate in accordance with stock price or return. With such initial indication, the

Table 1 Sample Data

No	Note	Decrease		Sample	
		Number	%	Number	%
1	Population targets			24,095	100.00%
2	Stock price data incomplete	8,939	37.10%	15,156	62.90%
3	Earnings data unavailable	661	2.74%	14,495	60.16%
4	Expected data unavailable	8,038	33.36%	6,457	26.80%
5	Lossing company exclusion	167	0.69%	6,290	26.11%
6	Extreme value exclusion	120	0.50%	6,170	25.61%
7	Inability to calculate abnormal return	38	0.16%	6,132	25.45%
	Total	17,963	74.55%		

Note: Number of valid observation for each country is Indonesia: 59; Malaysia: 326; Australia: 318; China: 976; Hongkong: 67; India: 171; Japan: 1.025; South Korea: 782; New Zealand: 50; Philipines: 38; Singapore: 193; Taiwan: 355; Thailand: 191; and US: 1.578. Mortal country during analysis is Sri Lanka: 3, and mortal countries before initial analysis are Pakistan, Bangladesh dan Vietnam.

Table 2 Descriptive Statistics

No.	Variables	Min.	Max.	Mean	Median	Std. Deviation	Perc. - 25	Perc. - 75
1	R_{i1}	-0.9954	9.8966	0.8463	0.5880	0.9999	0.1667	1.2500
2	R_{i2}	-0.9964	8.0000	0.4600	0.2419	0.7506	-0.0151	0.7500
3	R_{i3}	-0.9966	9.0000	0.1627	0.0327	0.5932	-0.1981	0.3689
4	R_{i4}	-0.9939	6.6310	0.0528	-0.0356	0.5175	-0.2450	0.2186
5	X_{it}	0.0000	46.2025	0.2092	0.0968	0.9104	0.0532	0.1959
6	$?q_{it}$	-55.1125	58.8148	0.0571	0.0071	1.7100	-0.0313	0.0772
7	$?b_{it}$	-54.3503	33.3750	-0.0873	0.0011	1.7231	-0.0608	0.0553
8	$?g_{it}$	-10.6073	54.4328	0.1977	0.0683	1.2737	0.0056	0.1976
9	$?r_{it}$	-29.9957	28.9790	-0.1362	-0.0737	1.3559	-0.4694	0.0301
10	$?EX_{it}$	-0.2886	1.8138	0.0474	0.0389	0.0612	0.0000	0.0771
11	$?Eg_{it}$	-70.4000	79.5890	-0.3552	-0.1391	3.1910	-0.8556	0.1311
12	PB_{it}	0.0026	70.4000	1.0362	0.6831	2.4254	0.3594	1.2095
13	V_{it}	0.0100	6,843.3600	39.3251	3.6300	248.8796	1.1600	16.3400
14	B_{it}	0.0200	4,601.1500	29.8525	2.7450	189.1163	0.5400	10.6200
15	AR_{i1}	-2.6632	8.9513	0.0000	-0.2030	0.9306	-0.5655	0.3361
16	AR_{i2}	-2.3542	7.1236	0.0000	-0.1283	0.6854	-0.4069	0.2438
17	AR_{i3}	-1.8951	8.5445	0.0000	-0.0862	0.5433	-0.3150	0.1953
18	AR_{i4}	-1.3450	6.2174	0.0000	-0.0818	0.4939	-0.2785	0.1558

Notes: Number of observation (N): 6.132. R_{it}: stock return for firm *i* during period *1 (1 year), 2 (1 year 3 months), 3 (1 year 6 months), and 4 (1 year 9 months);* x_{it}: earnings for firm *i* during period *t;* Δq_{it}: change of profitability for firm *i* during period *t;* Δb_{it}: change of book value for firm *i* during period *t;* Δg_{it}: change of growth opportunities for firm *i* during period *t;* Δr_{it}: change of discount rate during period *t; E:* abbreviation of Expected value; PB_{it}: ratio between stock market value and book value for firm *i* during period *t*; V_{it}: market value of stock firm *i* during period *t*; B_{it}: book value for firm *i* during period *t*; AR_{it}: stock abnormal return for firm *i* during period *1 (1 year), 2 (1 year 3 months), 3 (1 year 6 months), and 4 (1 year 9 months)*.

association between expected value of accounting information and firm market value is positive. Forward looking information probably associates with stock price or return.

Firm book value (B_{it}), ratio between market price and book value (PB_{it}), and stock market value (V_{it}) are always positive. This study eliminates firms with negative book value and having losses. Even though extreme values have been eliminated, maximum values for B_{it} and V_{it} still show great numbers. It especially occurs in developing countries where stock market value deviates from its book value. With mean of 29.8525 and median of 2.7450 B_{it} is in accordance with stock market value. Such indication does not disturb model validity. Pattern of such is also shown by firm intrinsic value (V_{it}) which is reflected in closing value of stock market price.

Abnormal return calculated with model of Fama and French (1992; 1993 and 1995) shows mean of 0.0000 for AR_{i1}, AR_{i2}, AR_{i3}, *dan* AR_{i4}. It means that estimation of abnormal return is valid mathematically. The standard deviation of abnormal return becomes smaller over time, from 0.9306 (AR_{i1}) become 0.4939 (AR_{i4}). The standard deviation indicates that abnormal return fluctuates in the same pattern as firm market value. Abnormal return fluctuation is also similar with return and earnings (x_{it}), change of earnings power (Δq_{it}), and change of growth opportunities (Δg_{it}). Such indication supports our hypotheses.

Basic Model (Chen and Zhang, 2007) Analysis

As first stage, this study examines model of Chen and Zhang (2007), it is henceforth called the basic model (model 4). It constructs five main factors which associate with return. They are earnings (x_{it}), change in firm book value (Δb_{it}), change in earnings power (Δq_{it}), change in growth opportunities (Δg_{it}), and change in discount rate (Δr_{it}). The result analysis is presented in Table 3 as follows.

This basic model examination serves as initial investigation of association between five factors with stock return. The result shows that earnings (x_{it}), firm book value (Δb_{it}), and growth opportunities (Δg_{it}) are consistently above 1% confirmed that they associate with stock return for various return specifications (R_{i1} until R_{i4}). This study is failed to confirm the association between earnings power (Δq_{it}) with stock return, unlike Chen and Zhang (2007) who confirm it consistently. Meanwhile, change in discount rate (Δr_{it}) is not consistently confirmed. Therefore, this study concludes that model of Chen and Zhang (2007) is adequately supported except for earnings power. Degree of association shows F-value of 35.5187 and significant at level 1%. This basic model has return type R^2 of 2.82% for R_{i1}, and lower for the others. Its *adj*-R^2 value is 2.74%.

The result of first stage examination is interesting. Earnings power and change in discount rate are not confirmed their association with stock returns. Even though the basic model is still able to conclude the association between accounting information and return, it is not flexible enough or rigid because the two variables above were not confirmed. Therefore, this result gives sufficient reason for further stage of examination. This study suspects that forward looking information can be induced into model.

Inducing Change in Expected Earnings into Model

This model initiates the inducing of forward looking information as basic model modification. This model, hereafter, is called model 5. The result of model 5 examination is presented in Table 4 as follows.

The result shows that hypothesis H_{A1} is supported. It means that earnings yield associates positively with stock price variations. Hypothesis H_{A3} which states that change in equity capital associates with stock return is supported. The same thing goes to hypothesis H_{A4} which states that change in growth opportunities associates with stock return. The three hypotheses are supported in all return types R_{i1} – R_{i4}. Furthermore, the result indicates that change in expected earnings associates with return with t-value of 2.5826 and is significant at level 1% for R_{i4} type. Therefore, change in expected earnings (ΔEx_{it}) associates positively with stock return or hypothesis H_{A2} is supported. The confirmation in R_{i4} returns type because change in expected earnings is measured annually. Then it associates with stock return which is also in annual measure. This examination cannot confirm hypothesis H_{A6}, that change in discount rate explain stock price movements. This model 5 has R^2 value of 2.82% for R_{i1} type, and lower for other return types. Its *adj*-R^2 value is 2.74%.

Table 3 Basic Model Analysis

Var (s).	Pred.	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
		Koef.	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*
α	?	0.8096	61.3526	0.0000 ***	0.4447	44.4938	0.0000 ***	0.1548	19.5395	0.0000 ***	0.0419	6.0803	0.0000 ***
X_{it}	+	0.1452	6.7848	0.0000 ***	0.0518	3.1938	0.0014 **	0.0203	1.5765	0.1150 ***	0.0397	3.5517	0.0004 ***
Δq_{it}	+	0.0002	0.0228	0.9818	0.0071	1.0400	0.2984	0.0084	1.5582	0.1192	0.0019	0.4119	0.6805 **
Δb_{it}	+	0.0450	4.7703	0.0000 ***	0.0277	3.8822	0.0001	0.0191	3.3806	0.0007	0.0256	5.2008	0.0000 **
Δg_{it}	+	0.0770	7.0549	0.0000	0.0438	5.2991	0.0000 ***	0.0246	3.7618	0.0002 ***	0.0248	4.3416	0.0000 ***
Δr_{it}	-	0.0370	3.9584	0.0001	0.0158	2.2393	0.0252	0.0000	-0.0070	0.9944	0.0017	0.3432	0.7315
F-value			35.5187	0.0000 ***		13.5133	0.0000 ***		6.0406	0.0000 ***		10.9147	0.0000 ***
R^2			2.82%			1.09%			0.49%			0.88%	
Adj-R^2			2.74%			1.01%			0.41%			0.80%	

Notes: Number of observation (N): 6.132. R_{it}: stock return for firm *i* during period *1 (1 year), 2 (1 year 3 months), 3 (1 year 6 months), and 4 (1 year 9 months);* x_{it}: earnings for firm *i* during period *t;* Δq_{it}: change in profitability for firm *i* during period *t;* Δb_{it}: change in book value firm *i* during period *t;* Δg_{it}: change in growth opportunities for firm *i* during period t; Δr_{it}: change in discount rate during period *t*; *** significant at level 1%, ** significant at level 5%, * significant at level 10%. Linearity examination for model 4 shows that: (1) *Kolmogorov-Smirnov* test is not passed with value of 9.036 and p-value 0.000, and *Jarque and Berra* test is not passed with value of 15,202.42 with *chi-square* 0.000 which means that the residual is distributed non normally. However, normality examination is ignorable for large data sample (6,132) since it tends to follow centralized limit theorem (Gudjarati, 2003). (2) *Glejser's test* shows that all variables are significant above 0.05, with t-value (sig.), x_{it} as much of 0.013(0.989); Δq_{it} as much of -0.014 (0.989); Δb_{it} as much -0.007 (0.994); Δg_{it} as much of -0.073 (0.942); and Δr_{it} as much of 0.010 (0.992). Therefore, it shows that all variables are clear from heteroscedasticity problem. (3) Multicollinearity test shows that all variables have VIF around one which means that collinearity between variables is deniable, VIF value for x_{it} is 2.394; Δq_{it} is 1.483; Δb_{it} is 1.664; Δg_{it} is 1.218; and Δr_{it} is 1,010. Detailed correlation matrix is in additional table as follows.

Additional table:

Variables	X_{it}	Δq_{it}	Δb_{it}	Δg_{it}	Δr_{it}	ΔEX_{it}
Δq_{it}	0.526 ***					
Δb_{it}	-0.620 ***	-0.247 ***				
Δg_{it}	0.353 ***	-0.004	-0.284 ***			
Δr_{it}	0.028 **	-0.007	0.043 ***	-0.031 **		
ΔEX_{it}	0.007	-0.008	0.014	-0.019	0.058 ***	
ΔEg_{it}	-0.366 ***	-0.154 ***	0.280 ***	-0.344 ***	0.117 ***	0.284 ***

Notes: *** significant at level 1%, ** significant at level 5%, * significant at level 10%.

Table 4 The Result of Inducing the Change in Expected Earnings

Var (s).	Pred.	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
		Koef.	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*
α	?	0.8064	49.0635	0.0000 ***	0.4839	38.9637	0.0000 ***	0.1700	17.2420	0.0000 ***	0.0287	3.3452	0.0008 ***
X_{it}	+	0.1450	6.7731	0.0000 ***	0.0541	3.3412	0.0008 ***	0.0211	1.6459	0.0998 *	0.0390	3.4831	0.0005 ***
ΔEX_{it}	+	0.0681	0.3303	0.7412	-0.8258	-5.2983	0.0000	-0.3209	-2.5925	0.0096	0.2783	2.5826	0.0098 ***
Δq_{it}	+	0.0003	0.0292	0.9767	0.0064	0.9391	0.3477	0.0081	1.5082	0.1316	0.0022	0.4622	0.6440
Δb_{it}	+	0.0449	4.7630	0.0000 ***	0.0284	3.9881	0.0001 ***	0.0194	3.4296	0.0006 ***	0.0254	5.1546	0.0000 ***
Δg_{it}	+	0.0771	7.0601	0.0000 ***	0.0428	5.1865	0.0000 ***	0.0243	3.7025	0.0002 ***	0.0251	4.4023	0.0000 ***
Δr_{it}	-	0.0368	3.9342	0.0001	0.0179	2.5303	0.0114	0.0008	0.1346	0.8929	0.0010	0.2018	0.8401
F-value			29.6128	0.0000 ***		15.9894	0.0000 ***		6.1586	0.0000 ***		10.2157	0.0000 ***
R^2			2.82%			1.54%			0.60%			0.99%	
Adj-R^2			2.72%			1.45%			0.50%			0.89%	

Notes: Number of observation (N): 6,132. R_{it}: stock return for firm *i* during period *1 (1 year), 2 (1 year 3 months), 3 (1 year 6 months), and 4 (1 year 9 months);* x_{it}: earnings for firm *i* during period *t;* ΔEx_{it}*:* change in expected earnings for firm *i* during period *t*; Δb_{it}*:* change in book value for firm *i* during period *t;* Δg_{it}*:* change in growth opportunities for firm *i* during period *t*; Δr_{it}: change in discount rate during period *t*; Δq_{it}*:* change in earnings power for firm *i* during period *t* is not used to examine hypothesis but included into model as in basic model. *** significant at level 1%, ** significant at level 5%, * significant at level 10%.

Inducing Change in Expected Growth opportunities into Model

The third analysis induces the change in expected growth opportunities. This analysis uses model 6. Inducing the change in expected growth opportunities was performed separately for it is mutually exclusive. The result is presented in the following Table 5. The result indicates that H_{A1}, $H_{A3,}$ and H_{A4} are consistently supported for $R_{i1} - R_{i4}$ return types. This model examines the association between the changes in expected growth opportunities (ΔEg_{it}) with return which is shown to be positive and significant at level 1% for $R_{i1} - R_{i4}$ return types. Thus, H_{A5} is supported. Furthermore, the change in expected growth opportunities is positive and consistent compared to previous analysis. Therefore, this study concludes that change in growth opportunities either in backward or forward looking perspective explains firm market value.

This model provides better proof with R^2 value of 3.92%, and *adj-*R^2 value of 3.82%. Compared to previous models, this model has greater predictive power than previous model. The difference is about 1.5%.

Inducing Change in Expected Earnings and Expected Growth Opportunities

The fourth analysis induces the change in expected earnings and the change in growth opportunities simultaneously. The model used in this analysis is model 7. The result is presented in the following Table 6. It indicates that hypotheses H_{A1}, $H_{A3,}$ $H_{A4,}$ and H_{A5} are consistently supported for all $R_{i1} - R_{i4}$ return types. It also shows that the change in expected earnings (ΔEx_{it}) are not confirmed its association with stock return, but the change in growth opportunities (ΔEg_{it}) associates positively and significantly at level 1% for all $R_{i1} - R_{i4}$ return types. Therefore, H_{A2} is not supported but H_{A5} is supported. Such indication is caused by multicollinearity between both variables. However, this study concludes that the information of change in growth opportunities either in backward or forward looking perspective explains firm market value.

Model 7 with inducing the change in expected earnings and growth opportunities shows increase of R^2 as much as 4,01% and *adj-*R^2 as much as 3.90%. Therefore, this model has better predictive power compared to previous models. Its increases are around 2%.

Sensitivity Examination Result

This study analysis model of inducing forward looking information based on the quintile of PB ratio. Model 5 and 6 are analyzed while model 7 did not because model 7 contains collinearity between the change in expected earnings (ΔEx_{it}) and the change in expected growth opportunities (ΔEg_{it}). The sample is arranged in five partitions and the result is presented in Table 7 as follows.

Table 7 –panel A– exhibits inducing the change in expected earnings based on PB quintile. It indicates that hypothesis H_{A2} which stated that the change in expected earnings associates positively with return is supported. This is shown in high level PB for all return types with significance level of 1%, except for R_{i1} return type whose significance level of 5%. It is also shown in medium PB level for R_{i1} and R_{i4} return types with significance level of, consecutively, 5% and 10%. Meanwhile, H_{A1}, H_{A3}, and H_{A4} are supported consistently as basic examination previously. Panel B displays inducing the change in growth opportunities based PB quintile. The result indicates that hypothesis H_{A5} which stated that the change in expected growth opportunities associates positively with return is supported. It is shown in high PB level with significance level of 1% for all return types. For return type of R_{i1} with medium PB level is also supported with significance level of 10%. Hypotheses H_{A1}, H_{A3}, and H_{A4}, are once again supported consistently as previous examination.

Table 5 The Result of Inducing the Change in Expected Growth Opportunities Analysis

Var (s).	Pred.	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
		Koef.	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*
α	?	0.8100	61.7261	0.0000 ***	0.4449	44.6360	0.0000 ***	0.1550	19.6391	0.0000 ***	0.0421	6.1318	0.0000 ***
X_{it}	+	0.1770	8.1893	0.0000 ***	0.0688	4.1898	0.0000 ***	0.0362	2.7863	0.0053 ***	0.0545	4.8141	0.0000 ***
Δq_{it}	+	0.0010	0.1133	0.9098	0.0075	1.1064	0.2686	0.0088	1.6395	0.1012	0.0023	0.4935	0.6216
Δb_{it}	+	0.0414	4.4153	0.0000 ***	0.0258	3.6234	0.0003 ***	0.0174	3.0759	0.0021 ***	0.0240	4.8850	0.0000 ***
Δg_{it}	+	0.0990	8.8653	0.0000 ***	0.0555	6.5518	0.0000 ***	0.0357	5.3135	0.0000 ***	0.0349	5.9803	0.0000 ***
ΔEg_{it}	+	0.0368	8.3806	0.0000 ***	0.0197	5.9021	0.0000 ***	0.0185	6.9909	0.0000 ***	0.0170	7.4121	0.0000 ***
Δr_{it}	-	0.0270	2.8881	0.0039	0.0105	1.4805	0.1388	-0.0050	-0.8917	0.3726	-0.0029	-0.5961	0.5511
F-value			41.6393	0.0000 ***		17.1290	0.0000 ***		13.2186	0.0000 ***		18.3323	0.0000 ***
R^2			3.92%			1.65%			1.28%			1.76%	
Adj-R^2			3.82%			1.55%			1.18%			1.67%	

Notes: Number of observation (N): 6,132. R_{it}: stock return for firm *i* during period *1 (1 year), 2 (1 year 3 months), 3 (1 year 6 months), and 4 (1 year 9 months);* x_{it}: earnings for firm *i* during period *t*; Δb_{it}: change in book value for firm *i* during period *t;* Δg_{it}: change in growth opportunities for firm *i* during period *t*; ΔEg_{it}: change in expected growth opportunities for firm *i* during period *t*; Δr_{it}: change in discount rate during period *t*; Δq_{it}: change in earnings power for firm *i* during period *t* is not used to examine hypothesis but included into model as in basic model. *** significant at level 1%, ** significant at level 5%, * significant at level 10%.

Table 6 The Result of Inducing the Change in Expected Earnings and Growth Opportunities

Var (s).	Pred.	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
		Coeff.	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*
α	?	0.8341	50.1147	0.0000 ***	0.5030	39.9570	0.0000 ***	0.1857	18.5827	0.0000 ***	0.0403	4.6252	0.0000 ***
X_{it}	+	0.1813	8.3607	0.0000 ***	0.0791	4.8235	0.0000 ***	0.0417	3.2009	0.0014 ***	0.0541	4.7685	0.0000 ***
ΔEX_{it}	+	-0.5064	-2.3509	0.0188	-1.2226	-7.5038	0.0000	-0.6460	-4.9942	0.0000	0.0380	0.3367	0.7363
Δq_{it}	+	0.0007	0.0734	0.9415	0.0066	0.9841	0.3251	0.0083	1.5578	0.1193	0.0023	0.4991	0.6177
Δb_{it}	+	0.0415	4.4285	0.0000 ***	0.0261	3.6767	0.0002 ***	0.0175	3.1065	0.0019 ***	0.0240	4.8829	0.0000 ***
Δg_{it}	+	0.1003	8.9787	0.0000 ***	0.0588	6.9622	0.0000 ***	0.0374	5.5761	0.0000 ***	0.0348	5.9543	0.0000 ***
ΔEg_{it}	+	0.0401	8.7008	0.0000 ***	0.0277	7.9435	0.0000 ***	0.0227	8.1983	0.0000 ***	0.0168	6.9515	0.0000 ***
Δr_{it}	-	0.0274	2.9270	0.0034	0.0114	1.6089	0.1077	-0.0046	-0.8122	0.4167	-0.0029	-0.6015	0.5476
F-value			36.5067	0.0000 ***		22.8584	0.0000 ***		14.9376	0.0000 ***		15.7273	0.0000 ***
R^2			4.01%			2.55%			1.68%			1.77%	
Adj-R^2			3.90%			2.43%			1.57%			1.65%	

Notes: Number of observation (N): 6,132. R_{it}: stock return for firm *i* during period *1 (1 year), 2 (1 year 3 months), 3 (1 year 6 months), and 4 (1 year 9 months);* x_{it}: earnings for firm *i* during period *t*; ΔEx_{it}: change in expected earnings for firm *i* during period *t*; Δb_{it}: change in book value for firm *i* during period *t;* Δg_{it}: change in growth opportunities for firm *i* during period *t*; ΔEg_{it}: change in expected growth opportunities for firm *i* during period *t*; Δr_{it}: change in discount rate during period *t*; Δq_{it}: change in earnings power for firm *i* during period *t* is not used to examine hypothesis but included into model as in basic model. Correlation examination shows that the change in expected earnings (ΔEx_{it}) and change in expected growth opportunities (ΔEg_{it}) have perfect correlation of 0,731, and significant at level 1%. Thus, correlation between both variables is confirmed. *** significant at level 1%, ** significant at level 5%, * significant at level 10%.

Table 7 Sensitivity Examination Based on PB

Panel A: Inducing the Change in Expected Earnings

	Var (s).	Pred.	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
			Coeff.	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*
PB Rendah	α	?	1.0872	25.9944	0.0000 ***	1.0349	27.9326	0.0000 ***	0.6098	19.5325	0.0000 ***	0.0562	2.0729	0.0384 **
	X_{it}	+	4.0422	16.5773	0.0000 ***	1.3039	6.0361	0.0000 ***	0.7643	4.1988	0.0000 ***	0.2214	5.2509	0.0000 ***
	ΔEX_{it}	+	-5.4114	-6.7607	0.0000	-7.6220	-10.7493	0.0000	-4.1475	-6.9416	0.0000	0.5706	1.4532	0.1464
	Δq_{it}	+	0.0754	1.9878	0.0471 **	0.0011	0.0337	0.9731	-0.0051	-0.1800	0.8572	-0.0153	-1.5680	0.1171
	Δb_{it}	+	0.0382	2.5311	0.0115 **	0.0265	1.9796	0.0480 **	0.0161	1.4273	0.1538	0.1549	5.1984	0.0000 ***
	Δg_{it}	+	-0.9110	-11.9261	0.0000	-0.2177	-3.2168	0.0013	-0.0986	-1.7297	0.0839	0.2151	4.9139	0.0000 ***
	Δr_{it}	-	-1.9622	-9.5749	0.0000 ***	-1.3633	-7.5096	0.0000 ***	-0.9542	-6.2377	0.0000 ***	-0.0694	-2.1041	0.0356 **
	F-value			66.1618	0.0000 ***		31.7552	0.0000 ***		17.1405	0.0000 ***		11.6661	0.0000 ***
	R^2			24.55%			13.51%			7.77%			5.43%	
	Adj-R^2			24.18%			13.08%			7.32%			4.96%	
	Var (s).	**Pred.**	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
			Coeff.	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*
PB Menengah-Rendah	α	?	0.9095	17.6476	0.0000 ***	0.5819	15.8049	0.0000 ***	0.2892	9.7565	0.0000 ***	0.0562	2.0729	0.0384 **
	X_{it}	+	0.1564	1.9520	0.0512 *	0.1717	2.9999	0.0028 ***	0.1348	2.9261	0.0035 ***	0.2214	5.2509	0.0000 ***
	ΔEX_{it}	+	0.2886	0.3868	0.6990	-1.9032	-3.5712	0.0004	-1.2361	-2.8806	0.0040	0.5706	1.4532	0.1464
	Δq_{it}	+	-0.0081	-0.4370	0.6622	-0.0169	-1.2758	0.2023	-0.0068	-0.6326	0.5271	-0.0153	-1.5680	0.1171
	Δb_{it}	+	0.0644	1.1370	0.2558	0.1005	2.4841	0.0131 **	0.0917	2.8142	0.0050 ***	0.1549	5.1984	0.0000 ***
	Δg_{it}	+	0.6954	8.3620	0.0000 ***	0.4832	8.1327	0.0000 ***	0.2676	5.5938	0.0000 ***	0.2151	4.9139	0.0000 ***
	Δr_{it}	-	-0.0508	-0.8102	0.4180	-0.0419	-0.9365	0.3492	-0.0901	-2.4981	0.0126 **	-0.0694	-2.1041	0.0356 **
	F-value			13.5697	0.0000 ***		16.1379	0.0000 ***		10.6388	0.0000 ***		11.6661	0.0000 ***
	R^2			6.26%			7.36%			4.98%			5.43%	
	Adj-R^2			5.80%			6.90%			4.51%			4.96%	
	Var (s).	**Pred.**	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
			Coeff.	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*
PB Menengah-Sedang	α	?	0.4505	12.4445	0.0000 ***	0.1894	7.4956	0.0000 ***	-0.0310	-1.6188	0.1057	-0.0940	-5.2593	0.0000 ***
	X_{it}	+	1.2317	12.5646	0.0000 ***	0.5952	8.6974	0.0000 ***	0.3473	6.7066	0.0000 ***	0.3761	7.7725	0.0000 ***
	ΔEX_{it}	+	0.6198	1.8910	0.0589 *	-0.1198	-0.5237	0.6006	0.1182	0.6826	0.4950	0.2975	1.8391	0.0661 *
	Δq_{it}	+	-0.1952	-3.3340	0.0009	-0.0048	-0.1186	0.9056	-0.0004	-0.0120	0.9904	-0.0329	-1.1389	0.2550
	Δb_{it}	+	-0.0257	-1.2474	0.2125	-0.0202	-1.4088	0.1592	0.0059	0.5403	0.5891	0.0228	2.2442	0.0250 **
	Δg_{it}	+	0.9165	10.5083	0.0000 ***	0.7030	11.5473	0.0000 ***	0.3933	8.5380	0.0000 ***	0.3760	8.7335	0.0000 ***
	Δr_{it}	-	0.0026	0.0893	0.9289	-0.0102	-0.4911	0.6234	-0.0439	-2.8005	0.0052 ***	-0.0425	-2.9025	0.0038 ***
	F-value			47.4260	0.0000 ***		38.6884	0.0000 ***		23.3161	0.0000 ***		26.3550	0.0000 ***
	R^2			18.91%			15.99%			10.29%			11.47%	
	Adj-R^2			18.51%			15.57%			9.85%			11.04%	
	Var (s).	**Pred.**	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
			Coeff.	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*
PB Menengah-Tinggi	α	?	0.2771	9.8573	0.0000 ***	0.1010	5.0708	0.0000 ***	-0.1115	-7.2001	0.0000 ***	-0.1380	-8.9407	0.0000 ***
	X_{it}	+	1.5983	20.7287	0.0000 ***	0.8861	16.2153	0.0000 ***	0.4926	11.5946	0.0000 ***	0.3641	8.6008	0.0000 ***
	ΔEX_{it}	+	-0.0531	-0.1734	0.8624	-0.4172	-1.9220	0.0548	0.1274	0.7552	0.4502	0.1372	0.8163	0.4145
	Δq_{it}	+	0.0454	2.4325	0.0151 **	0.0324	2.4440	0.0147 **	0.0224	2.1807	0.0294 **	0.0178	1.7396	0.0822 *
	Δb_{it}	+	0.0261	1.9966	0.0461 **	0.0136	1.4668	0.1427	-0.0055	-0.7709	0.4409	0.0037	0.5234	0.6008
	Δg_{it}	+	0.2612	5.1685	0.0000 ***	0.0879	2.4546	0.0142 **	-0.0151	-0.5407	0.5888	0.0228	0.8221	0.4112
	Δr_{it}	-	0.0303	2.0327	0.0423	-0.0088	-0.8300	0.4067	-0.0314	-3.8287	0.0001 ***	-0.0189	-2.3109	0.0210 **
	F-value			128.4472	0.0000 ***		71.7755	0.0000 ***		35.5581	0.0000 ***		20.5082	0.0000 ***
	R^2			38.73%			26.11%			14.90%			9.17%	
	Adj-R^2			38.43%			25.74%			14.48%			8.72%	
	Var (s).	**Pred.**	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
			Coeff.	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*
PB Tinggi	α	?	0.4138	18.1664	0.0000 ***	0.1212	7.3224	0.0000 ***	-0.1537	-13.3840	0.0000 ***	-0.1989	-18.1059	0.0000 ***
	X_{it}	+	0.0959	3.4999	0.0005 ***	0.0295	1.4818	0.1386	0.0254	1.8416	0.0658 *	0.0380	2.8797	0.0041 ***
	ΔEX_{it}	+	0.6236	2.4828	0.0132 **	0.6514	3.5709	0.0004 ***	0.6575	5.1932	0.0000 ***	0.5957	4.9177	0.0000 ***
	Δq_{it}	+	-0.0029	-0.3009	0.7635	0.0071	0.9982	0.3184	0.0001	0.0228	0.9818	-0.0087	-1.8418	0.0658
	Δb_{it}	+	0.0240	1.4922	0.1359	0.0121	1.0364	0.3002	0.0134	1.6506	0.0991 *	0.0191	2.4587	0.0141 **
	Δg_{it}	+	0.0469	4.6574	0.0000 ***	0.0319	4.3572	0.0000 ***	0.0170	3.3551	0.0008 ***	0.0183	3.7605	0.0002 ***
	Δr_{it}	-	0.0210	2.7362	0.0063	0.0089	1.5885	0.1124	-0.0033	-0.8455	0.3980	-0.0003	-0.0808	0.9356
	F-value			16.6828	0.0000 ***		9.6715	0.0000 ***		8.5588	0.0000 ***		10.7250	0.0000 ***
	R^2			7.59%			4.54%			4.04%			5.01%	
	Adj-R^2			7.13%			4.07%			3.57%			4.55%	

Additional Notes: Number of observation (N) for Low PB: 1,227, Low-Medium PB: 1,226, Medium PB: 1,227, Medium-High PB: 1,226, High PB: 1,226. The limits for each PB are: Low PB < 0.3065; Low-Medium PB < 0.5462; Medium PB < 0.8505; Medium-High PB < 1.3687, High PB > 1.3687.

Table 7 Sensitivity Examination Based on PB, *... cont.*

Panel B: Inducing the Change in Expected Growth Opportunities

	Var (s).	Pred.	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
			Koef.	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*
PB Rendah	α	?	0.9288	26.4450	0.0000 ***	0.8136	25.6220	0.0000 ***	0.4895	18.7027	0.0000 ***	0.2148	9.5078	0.0000 ***
	X_{it}	+	3.6556	15.1250	0.0000 ***	0.7470	3.4187	0.0006 ***	0.4604	2.5564	0.0107 **	0.6360	4.0915	0.0000 ***
	Δq_{it}	+	0.0581	1.5083	0.1317	-0.0213	-0.6129	0.5401	-0.0172	-0.5992	0.5492	0.0018	0.0747	0.9405
	Δb_{it}	+	0.0406	2.6430	0.0083 ***	0.0297	2.1406	0.0325 **	0.0178	1.5593	0.1192	0.0137	1.3860	0.1660
	Δg_{it}	+	-0.7981	-10.5029	0.0000	-0.0549	-0.7993	0.4242	-0.0098	-0.1733	0.8625	-0.0987	-2.0189	0.0437
	ΔEg_{it}	+	-0.1210	-1.4850	0.1378	-0.3143	-4.2688	0.0000	-0.1808	-2.9783	0.0030	0.0365	0.6968	0.4860
	Δr_{it}	-	-1.9144	-9.1785	0.0000 ***	-1.3139	-6.9679	0.0000 ***	-0.9286	-5.9742	0.0000 ***	-0.5916	-4.4101	0.0000 ***
	F-value			56.8994	0.0000 ***		14.6236	0.0000 ***		10.3056	0.0000 ***		7.6729	0.0000 ***
	R^2			21.86%			6.71%			4.82%			3.64%	
	Adj-R^2			21.48%			6.25%			4.36%			3.16%	
	Var (s).	**Pred.**	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
			Koef.	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*
PB Menengah-Rendah	α	?	0.9222	25.9464	0.0000 ***	0.4938	19.3931	0.0000 ***	0.2327	11.3680	0.0000 ***	0.0867	4.6309	0.0000 ***
	X_{it}	+	0.1593	1.9848	0.0474 **	0.1576	2.7409	0.0062 ***	0.1249	2.7013	0.0070 ***	0.2211	5.2293	0.0000 ***
	Δq_{it}	+	-0.0085	-0.4580	0.6470	-0.0150	-1.1252	0.2607	-0.0054	-0.5034	0.6148	-0.0153	-1.5653	0.1178
	Δb_{it}	+	0.0660	1.1642	0.2446	0.0929	2.2854	0.0225 **	0.0862	2.6384	0.0084 ***	0.1543	5.1654	0.0000 ***
	Δg_{it}	+	0.6958	8.3643	0.0000 ***	0.4835	8.1117	0.0000 ***	0.2673	5.5781	0.0000 ***	0.2123	4.8459	0.0000 ***
	ΔEg_{it}	+	0.0118	0.4103	0.6817	-0.0496	-2.4095	0.0161	-0.0367	-2.2200	0.0266	-0.0108	-0.7140	0.4754
	Δr_{it}	-	-0.0483	-0.7704	0.4412	-0.0552	-1.2301	0.2189	-0.0992	-2.7477	0.0061 ***	-0.0683	-2.0676	0.0389 **
	F-value			13.5731	0.0000 ***		14.9010	0.0000 ***		10.0518	0.0000 ***		11.3842	0.0000 ***
	R^2			6.26%			6.83%			4.71%			5.31%	
	Adj-R^2			5.80%			6.37%			4.25%			4.84%	
	Var (s).	**Pred.**	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
			Koef.	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*
PB Menengah-Sedang	α	?	0.4792	15.5478	0.0000 ***	0.1845	8.5798	0.0000 ***	-0.0212	-1.3012	0.1934	-0.0767	-5.0355	0.0000 ***
	X_{it}	+	1.2576	12.8114	0.0000 ***	0.5891	8.5991	0.0000 ***	0.3452	6.6612	0.0000 ***	0.3829	7.8929	0.0000 ***
	Δq_{it}	+	-0.2033	-3.4775	0.0005	-0.0032	-0.0772	0.9385	-0.0011	-0.0365	0.9709	-0.0362	-1.2520	0.2108
	Δb_{it}	+	-0.0251	-1.2186	0.2232	-0.0204	-1.4169	0.1568	0.0060	0.5511	0.5816	0.0231	2.2694	0.0234 **
	Δg_{it}	+	0.9236	10.5691	0.0000 ***	0.7009	11.4937	0.0000 ***	0.3901	8.4557	0.0000 ***	0.3757	8.7000	0.0000 ***
	ΔEg_{it}	+	0.0179	1.7089	0.0877 *	-0.0049	-0.6760	0.4991	-0.0058	-1.0513	0.2933	0.0011	0.2185	0.8271
	Δr_{it}	-	0.0097	0.3322	0.7398	-0.0114	-0.5553	0.5788	-0.0414	-2.6739	0.0076 ***	-0.0382	-2.6355	0.0085 ***
	F-value			47.2917	0.0000 ***		38.7246	0.0000 ***		23.4348	0.0000 ***		25.7290	0.0000 ***
	R^2			18.87%			16.00%			10.33%			11.23%	
	Adj-R^2			18.47%			15.58%			9.89%			10.80%	
	Var (s).	**Pred.**	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
			Koef.	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*
PB Menengah-Tinggi	α	?	0.2745	11.4380	0.0000 ***	0.0812	4.7652	0.0000 ***	-0.1054	-7.9728	0.0000 ***	-0.1314	-9.9718	0.0000 ***
	X_{it}	+	1.6042	20.6794	0.0000 ***	0.8755	15.9031	0.0000 ***	0.4960	11.6013	0.0000 ***	0.3664	8.5991	0.0000 ***
	Δq_{it}	+	0.0453	2.4258	0.0154 **	0.0328	2.4731	0.0135 **	0.0223	2.1670	0.0304 **	0.0177	1.7283	0.0842 *
	Δb_{it}	+	0.0260	1.9963	0.0461 **	0.0130	1.3991	0.1620	-0.0054	-0.7447	0.4566	0.0039	0.5505	0.5821
	Δg_{it}	+	0.2616	5.1810	0.0000 ***	0.0911	2.5416	0.0112 **	-0.0160	-0.5757	0.5649	0.0218	0.7859	0.4321
	ΔEg_{it}	+	0.0069	0.6906	0.4900	-0.0057	-0.7953	0.4266	0.0020	0.3569	0.7212	0.0006	0.1125	0.9104
	Δr_{it}	-	0.0311	2.0845	0.0373	-0.0084	-0.7935	0.4277	-0.0315	-3.8341	0.0001 ***	-0.0191	-2.3372	0.0196 **
	F-value			128.5688	0.0000 ***		71.0870	0.0000 ***		35.4714	0.0000 ***		20.3883	0.0000 ***
	R^2			38.76%			25.92%			14.86%			9.12%	
	Adj-R^2			38.45%			25.56%			14.45%			8.67%	
	Var (s).	**Pred.**	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
			Koef.	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*	*Koef.*	*t-value*	*Sig.*
PB Tinggi	α	?	0.4597	22.7135	0.0000 ***	0.1632	11.0796	0.0000 ***	-0.1143	-11.1642	0.0000 ***	-0.1645	-16.7197	0.0000 ***
	X_{it}	+	0.1268	4.5959	0.0000 ***	0.0529	2.6357	0.0085 ***	0.0445	3.1890	0.0015 ***	0.0534	3.9825	0.0001 ***
	Δq_{it}	+	-0.0011	-0.1140	0.9092	0.0083	1.1756	0.2400	0.0009	0.1928	0.8472	-0.0081	-1.7186	0.0859
	Δb_{it}	+	0.0140	0.8734	0.3826	0.0049	0.4229	0.6724	0.0078	0.9665	0.3340	0.0148	1.8933	0.0586 *
	Δg_{it}	+	0.0583	5.7255	0.0000 ***	0.0402	5.4251	0.0000 ***	0.0236	4.5824	0.0000 ***	0.0235	4.7377	0.0000 ***
	ΔEg_{it}	+	0.0223	5.6813	0.0000 ***	0.0166	5.8165	0.0000 ***	0.0133	6.7103	0.0000 ***	0.0106	5.5738	0.0000 ***
	Δr_{it}	-	0.0150	1.9462	0.0519	0.0048	0.8491	0.3960	-0.0063	-1.6140	0.1068	-0.0026	-0.6815	0.4957
	F-value			21.3686	0.0000 ***		13.3140	0.0000 ***		11.6276	0.0000 ***		11.9094	0.0000 ***
	R^2			9.52%			6.15%			5.41%			5.54%	
	Adj-R^2			9.07%			5.69%			4.95%			5.07%	

Additional Notes: Number of observation (N) for Low PB: 1,227, Low-Medium PB: 1,226, Medium PB: 1,227, Medium-High PB: 1,226, High PB: 1,226. The limits for each PB are: Low PB < 0.3065; Low-Medium PB < 0.5462; Medium PB < 0.8505; Medium-High PB < 1.3687, High PB > 1.3687.

Examination using sample partitioning based on PB level shows that hypothesis H_{A6} which states that discount rate associates negatively with stock price is supported, either in panel A or B. It is shown in low, low-medium, medium, and medium-high PB level with significance level of 5% and 10%. Moreover, this examination using PB parti-

tioning show increase of R^2 around 5%-25% and *adj*-R^2 around 4%-24%. Therefore, this sensitivity model has better predictive power than previous models.

Robustness Examination

All examination results of model 5-6 which uses return are re-examined using abnormal return. This examination is aimed to identify the robustness of association for all confirmed variables and investigates its accordance with theory for unconfirmed variables. This examination does not only anticipate systematic risks but also idiosyncratic risks. The calculation of abnormal return is based on concept of Fama and French (1992; 1993 and 1995). The regression for all return types indicates that $ln(ME_{it})$ associates negatively with return types of R_{i1}, R_{i2}, and R_{i3} with significance level of 1%, and not significant for R_{i4} return type. Meanwhile, $ln[(BE/ME)_{it}]$ associates negatively with all types of return with significance level of 1%. The *adj*-R^2 value for R_{i1} is 13.3%; R_{i2} is 16,6%; R_{i3} is 16,1%; and R_{i4} is 8,9%. The model of Fama and French complete result is presented in Table 8 as follows.

The residuals from four regressions above serve as abnormal return. Then this abnormal return serves as dependent variable to examine additional predictive power. The complete result of robustness examination is presented on Table 9 as follows. The result of model 5 – panel A– which induces the change in expected earnings confirms all hypotheses. All hypotheses H_{A1}, H_{A2}, H_{A3}, H_{A4}, H_{A5}, and H_{A6} are supported at significance level of 1% or 5% for all R_{i1}-R_{i4} return types. Panel B which induces the change in expected growth opportunities shows the same result. All hypotheses H_{A1}, H_{A2}, H_{A3}, H_{A4}, H_{A5}, and H_{A6} are supported with significance level of 1% for all R_{i1}-R_{i4} return types. This robustness examination shows the highest degree of association for R_{i1} return type with R^2 as mush as 5.16% and *adj*-R^2 as much as 5.05% for R_{i1} return type. Other return types show lower figures.

Discussion

All examinations show that association and its direction between accounting fundamentals and stock price movements as hypothesized are supported. This section describes each variables interpretation and concludes in research finding.

Earnings yields and Change in Expected Earnings Earnings yield and change in expected earnings associate positively with firm market value. This study supports classical concept (Ohlson, 1995), along with its derivatives studies Lo and Lys (2000), Francis and Schipper (1999), Meyers (1999), Bradshaw, Richardson and Sloan (2006), Cohen and Lys (2006), Bradshaw and Sloan (2002), Bhattacharya, et al. (2003), Collins, Maydew and Weiss (1997), Givoly and Hayn (2000), Kolev, Marquadt and McVay (2008), and Weiss, Naik and Tsai (2008). Eventhough Ohlson (1995) has some weakness that earnings are disturbance when measuring firm market price, this study concludes that earnings is still as a related-cash flow factor of firm value. Therefore, this study indicates that earnings are indicator of value added within accounting matters, and are absolutely reflected in market value.

The reflection of earnings in stock price variations implies that earnings are fundamental signal (Ohlson, 1995; Feltham and Ohlson, 1995, 1996). This study suggests that this fundamental signal comes from the nature of earnings which serve as driver of firm performance. Earnings as driver of firm performance and then stock price movements can be viewed as potential. The users of financial statements absorb this potential as a related-cash flow factor of firm value. This study supports the concept of recursion theory (Sterling, 1968) which states that firm value can be identified from firm book value and earnings. Their values are manifested in stock price movements. Finally, this study concludes that book value and accounting earnings associates with stock price variations.

Table 8 Model of Fama and French Result

Var (s).	Pred.	R_{i1}			R_{i2}			R_{i3}			R_{i4}		
		Coeff.	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*
α	?	0.885884	58.43394	0 ***	0.4605	41.2428	0.0000 ***	0.1087	12.2863	0.0000 ***	-0.0148	-1.8423	0.0655 *
ME_{it}	-	-0.135962	-21.37755	7.51E-98 ***	-0.0969	-20.6801	0.0000 ***	-0.0426	-11.4775	0.0000 ***	-0.0038	-1.1305	0.2583
$(BE/ME)_{it}$	-	-0.352868	-26.28162	2.4E-144 ***	-0.3167	-32.0287	0.0000 ***	-0.2672	-34.0954	0.0000 ***	-0.1720	-24.1434	0.0000 ***
F-value			473.2644	0.0000 ***		610.7027	0.0000 ***		589.5962	0.0000 ***		300.6049	0.0000 ***
R^2			13.38%			16.62%			16.14%			8.93%	
Adj-R^2			13.35%			16.59%			16.11%			8.90%	

Notes: Number of observation (N): 6,132. AR_{it}: abnormal stock return for firm *i* during period *1 (1 year), 2 (1 year 3 months), 3 (1 year 6 months), and 4 (1 year 9 months); ME* : equity for firm *i* during period *t* which is calculated by number of outstanding shares multiplied by stock market price; $(BE/ME)_{it}$ is ratio between accounting equity and financial equity.

Table 9 Robustness Examination Result

Panel A: Inducing the Change in Expected Earnings

Var (s).	Pred.	AR_{i1}			AR_{i2}			AR_{i3}			AR_{i4}		
		Coeff.	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*
α	?	-0.0813	-5.3704	0.0000 ***	-0.0103	-0.9170	0.3592	-0.0170	-1.9002	0.0575 *	-0.0370	-4.5447	0.0000 ***
X_{it}	+	0.1733	8.7916	0.0000 ***	0.0835	5.7051	0.0000 ***	0.0524	4.4978	0.0000 ***	0.0629	5.9396	0.0000 ***
ΔEX_{it}	+	0.5529	2.9111	0.0036 ***	-0.4573	-3.2416	0.0012	-0.1134	-1.0102	0.3125	0.3495	3.4232	0.0006 ***
Δq_{it}	+	-0.0024	-0.2963	0.7670	0.0038	0.6132	0.5397	0.0057	1.1584	0.2467	0.0004	0.0944	0.9248
Δb_{it}	+	0.0415	4.7764	0.0000 ***	0.0253	3.9298	0.0001 ***	0.0169	3.2837	0.0010 ***	0.0238	5.0938	0.0000 ***
Δg_{it}	+	0.1007	10.0205	0.0000 ***	0.0647	8.6703	0.0000 ***	0.0439	7.3928	0.0000 ***	0.0385	7.1182	0.0000 ***
Δr_{it}	-	-0.0197	-2.2929	0.0219 **	-0.0272	-4.2519	0.0000 ***	-0.0285	-5.5933	0.0000 ***	-0.0125	-2.7017	0.0069 ***
F-value			52.7621	0.0000 ***		34.4951	0.0000 ***		26.4094	0.0000 ***		25.5695	0.0000 ***
R^2			4.91%			3.27%			2.52%			2.44%	
Adj-R^2			4.82%			3.17%			2.43%			2.35%	

Panel B: Inducing the Change in Expected Growth opportunities

Var (s).	Pred.	AR_{i1}			AR_{i2}			AR_{i3}			AR_{i4}		
		Coeff.	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*	*Coeff.*	*t-value*	*Sig.*
α	?	-0.0548	-4.5167	0.0000 ***	-0.0320	-3.5424	0.0004 ***	-0.0224	-3.1141	0.0019 ***	-0.0203	-3.1102	0.0019 ***
X_{it}	+	0.1919	9.5976	0.0000 ***	0.0845	5.6809	0.0000 ***	0.0533	4.5044	0.0000 ***	0.0677	6.2919	0.0000 ***
Δq_{it}	+	-0.0025	-0.3011	0.7634	0.0042	0.6851	0.4933	0.0058	1.1844	0.2363	0.0002	0.0497	0.9604
Δb_{it}	+	0.0400	4.6138	0.0000 ***	0.0247	3.8245	0.0001 ***	0.0166	3.2360	0.0012 ***	0.0236	5.0583	0.0000 ***
Δg_{it}	+	0.1118	10.8289	0.0000 ***	0.0668	8.6996	0.0000 ***	0.0449	7.3462	0.0000 ***	0.0407	7.3158	0.0000 ***
ΔEg_{it}	+	0.0197	4.8518	0.0000 ***	0.0026	0.8663	0.3863	0.0014	0.5794	0.5624	0.0044	2.0277	0.0426 **
Δr_{it}	-	-0.0237	-2.7365	0.0062 ***	-0.0290	-4.5060	0.0000 ***	-0.0291	-5.6845	0.0000 ***	-0.0128	-2.7533	0.0059 ***
F-value			55.3992	0.0000 ***		32.8168	0.0000 ***		26.2924	0.0000 ***		24.2725	0.0000 ***
R^2			5.15%			3.11%			2.51%			2.32%	
Adj-R^2			5.05%			3.02%			2.42%			2.23%	

Notes: Number of observation (N): 6,132. AR_{it}: abnormal stock return for firm *i* during period *t, 1 (1 year), 2 (1 year 3 months), 3 (1 year 6 months), and 4 (1 year 9 months);* x_{it}: earnings for firm *i* during period *t;* ΔEx_{it}: change in expected earnings for firm *i* during period *t*; Δb_{it}: change in book value for firm *i* during period *t;* Δg_{it}: change in growth opportunities for firm *i* during period *t*; ΔEg_{it}: change in expected growth opportunities for firm *i* during period *t*; Δr_{it}: change in discount rate during period *t*; Δq_{it}: change in earnings power for firm *i* during period *t* is not used to examine hypothesis but included as variables as in basic model. *** significant at level 1%, ** significant at level 5%, * significant at level 10%.

In forward looking perspective, this study notices that expected earnings can be identified in firm market value. Expected earnings can improve market value if they are transparent and convincing (Zarb, 2007; Fay, 2009, dan Shaw, 2007). This study suggests that expected earnings and its change help to predict stock price reasonably (Lev and Thiagarajan, 1993; Abarbanell and Bushee, 1997; Brown, Foster, and Noreen, 1985; Cornell and Landsman, 1989, dan Easton and Harris, 1991). The investors as user of this expected earnings information should look forward that this expectation is achieved for they do not want to suffer from losses (Beaver, Lambert and Morse, 1980). Not only earnings, but also expected earnings are reflected in stock price movements (Copeland, et al., 2004; Chen and Zhang, 2007; and Weiss, Naik and Tsai, 2008). Therefore, this study points out that return model become stronger when including not only earnings yield, but also expected earnings or its change.

Change in Book Value This study confirms the association between book value and stock return. It supports Ohlson (1995) and Lundholm (1995) who conclude that book value determine firm market value. In addition, Lo and Lys (2000) imply that firm equity value is a function of discounted future earnings and dividend. Dechow, Hutton, and Sloan (1999) re-evaluate capital rate of return based on residual earnings. Beaver (1999), Hand (2001), and Myers (1999) support that book value and earnings as evaluator of firm market value. This study suggests that book value improve association degree of return model.

This study indicates that change in book value is the center of firm market equity measurement. Hence, change in equity capital equals to current earnings. Consequently, book value will increase along with equity capital, and also with stock return (Rao and Litzenberger, 1971; Litzenberger and Rao, 1972; Bao and Bao, 1989; Burgstahler and Dichev, 1997; Collins, Pincus and Xie, 1999; Collins, Kothari and Rayburn, 1987; Cohen and Lys, 2006; Liu and Thomas, 2000; Liu, Nissim and Thomas, 2001; Weiss, Naik and Tsai, 2008; Chen and Zhang, 2007; Ohlson, 1995; Feltham and Ohlson, 1995; Feltham and Ohlson, 1996; Bradshaw, Richardson and Sloan, 2006; and Abarbanell and Bushee, 1997).

Change in Growth Opportunities and Its Expected Value This study notes that growth rate and its change improve firm competitiveness. Higher efficiency enhances productivity and increases stockholders' wealth (Rao and Litzenberger, 1971; Litzenberger and Rao, 1972; and Bao and Bao, 1972). This study supports the concept of Miller and Modigliani (1961) which suggest that growing firms are firms having positive capital rate of return for each invested asset.

This study posits that firm intrinsic value is determined by current growth and future potential growth. Current growth improves future residual earnings, while future potential growth reduces model residual error to improve association degree of return model (Liu, Nissim and Thomas, 2001; Aboody, Hughes and Liu, 2002; and Frankel and Lee, 1998). Growth opportunities associate with stock price movements because it improves future earnings. It also increases firm equity (Lev and Thiagarajan, 1993; Abarbanell and Bushee, 1997; and Weiss, Naik and Tsai, 2008). Accordingly, this study suggests that stock price responds to growth opportunities and its expected value.

This study verifies that firm equity completely depends on growth opportunities. Growth opportunities itself is a scalable function of firm assets exploitation and affects future growth opportunities (Chen and Zhang, 2007). Growth opportunities are included into return model because of its ability to drive earnings. Expected growth opportunities works in the same framework as the change in expected earnings. It indicates potential to

generate earnings, and then reflected in stock price variations. Therefore, the inducement of expected growth opportunities into return model is expected to improve its degree of association. Conclusively, this study confirms the association between growth and its expected value with stock price movements.

Change in Discount Rate Our main analysis fails to show significant result. However, sensitivity test shows significant results except for High PB ratio. Robustness test consistently shows significant results that change in discount rate associates negatively with stock return. This study notes that change in discount rate associates negatively with abnormal return. Our initial indication states that firm equity can be increased by value adaptation concept. Equity value can be increased by adapting alternative resources with lower interest rate. It will improve resources productivity (Burgstahler and Dichev, 1997). Meanwhile, Aboody, Hughes and Liu (2002), Frankel and Lee (1998), Zhang (2000) and Chen and Zhang (2007) argue that one factor which affects earnings growth is pure interest rate.

This study implies that interest rate has multiplier effects. When interest rate falls, firm could potentially increase its earnings. The available methods are procuring additional liabilities or new capital to reduce weighted interest rate (Rao and Litzenberger, 1971; and Litzenberger and Rao, 1972). Therefore, this study supports that firm equity is determined by favorable discount rate to grow assets, earnings, and equity book value (Danielson and Dowdell, 2001; and Liu, Nissim and Thomas, 2001).

Model This study performed four model examinations and re-examined model sensitivity and robustness. This study is able to offer better return association degree compared to previous study model. Its associative degree increases around 2%. Partition of PB ratio examination shows that model 5-7 have *adj-*R^2 around 5%-25%. It is empirical evidences that inducing forward looking information improves association power. Thus, implicit hypothesis that this study can enhance the association degree of return model in comparison with previous study is supported. It also means that this model developed by this study has incremental explanatory power. However, examination using abnormal return shows that model 5–7 with *adj-*R^2 around 4%-5% are comparable with those of Chen and Zhang (2007). This study is unable to result in higher degree of association. Previously, model of Fama and French (1992, 1993, and 1995) show *adj-*R^2 of 13%, within range of 9%-16%. This study offers the same value of *adj-*R^2 as previous study model.

Research Findings

Based on all analysis, this research concludes some findings described as follows. First, all fundamental accounting information as theories that they associate with stock price movements is verified. Three main factors, earnings yield, change in book value, and change in growth opportunities associate positively. The change in discount rate associates negatively with stock price variations. All these findings are identifiable in abnormal return examination.

Second, this study notices those five-related-cash flow factors of fundamental accounting information and two-related-cash flow factors in forward looking perspectives when examined using PB ratio partition offer better evidence. This study notes that both high level and medium-high level of PB ratio have better associative power compared to lower level of PB ratio. This study argues that high PB ratio indicates firm highly accumulated earnings and is reflected in current year earnings.

Third, this study confirm a robust and effective results when fundamental accounting information and its forward looking perspective are related to abnormal return. With abnormal return investigation, five-related-

cash flow factors of accounting information confirm that they associate with stock price movements. Furthermore, their association direction is confirmed. Two-related-cash flow factors of forward looking information associate positively with stock price. This result indicates that the association between accounting fundamentals and stock price variations does not only consider systematic risks, but also idiosyncratic risks. It means that the risks of accounting information are universal and have considered their errors.

CONCLUSIONS AND LIMITATIONS

Conclusions

This study documents analysis result in conclusions as follows. Earnings yields change in expected earnings associate positively with firm market value. The association between book value and stock return is verified and we conclude that book value determine stock price variations. This study also confirms the association between growth opportunities and its expected value with stock price movements. In other words, stock market price adjusts to growth opportunities and its expected value. Change in discount rate associates negatively with abnormal return. All examination results are in accordance with hypotheses, including robustness and sensitivity examination based on PB ration, and abnormal return.

This study offers better associative power when explaining return model. Nevertheless, this study is comparable with previous studies with low association degree. PB ratio partition examination gives better association degree. Under abnormal return examinations, the model in this study is proven to have better associative power. Therefore, we conclude that this study contributes additional related-cash flow factors that are earnings yield and growth opportunities of forward looking information.

This study is succeeded to provide better associative power when examining the association between accounting information and stock price variations. This is especially shown in PB ratio partition in sub sample examination. All findings conclude that this research supports the association between accounting fundamentals and stock price movements. This study also suggests that investors trading strategies should rely on and realize to accounting fundamentals.

Limitations

The analysis results of association model between accounting information and stock return provide valid empirical evidence. Careful comprehension is necessary because research design is not flawless. The limitations are explained as follows. The first is large data sample usage. Large data sample tends to result in low degree of association, measured in *adj-*R^2, due to law of large data sample. Second, this study has survivorship bias when examining hypotheses. From all 24,095 firm-years, this study only uses 6,132 (25.45%) because the rest is not analyzable.

Third, this study uses six sampling criteria. This study can not find firms with negative book value and negative earnings. Such firms are needed as control group. Therefore, this study is unable to procure robustness examination for such firms. Fourth, the sample combination from weak to semi-strong markets may cause bias. Though, it is deniable by market-wide regime concept, but the differences in economy, regulations, trading mechanisms, and cultural are ignored in this study. Factually, such factors affect return model.

Fifth, this study uses earnings after tax show it ignores earnings quality which alters associative degree of return model. However, it is denied by the fact that lower PB ratio tends to occur in firms having good earnings quality. Last, statements of financial position usually are presented under conservatism

which tends to understate assets. This ex-ante conservatism may influence return model. This study did not put such conservatism into consideration.

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