

Common Equity Equilibrium and Its Applications

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Abstract

Despite of the overabundance of academic research and empirical evidence on the relation of stock market value and accounting variables or financial ratios, but relatively deficiency explanation in term of mathematical expressions. By this reason, this study attempts to comprehend the general relevance or behavioral impact of conservative accounting numbers versus market value of equity by employing the ratio of the cost of equity (COE) –to- return on equity (ROE). In the relation of return demand and return supply, researcher attains the equilibrium condition in common equity which can be described forward the relationship between stock market value and some financial factors in terms of linear equation. In application, the proposition explains how to adapt these relations in order to apprehend the balancing situation, also to determine the overpricing or underpricing situation of equity worth at time.

Keywords: common equity equilibrium, equity balancing determination, overpricing or underpricing identification approach, COE-to-ROE ratio, value relevance

1. Introduction and Literature Reviews

A large number of researches in finance have demonstrated the effect of the stock market value (or market price) held against a firm's performance and fundamental data. Since several decades ago, many researchers empirically studied to achieve the relevance of stock returns and economic factors. Such as Fama and Schwert (1977), Campbell (1987), and Fama and French (1988a&b, 1991) attain that macroeconomic variables such as short-term interest rates, expected inflation, dividend yields, yield spreads between long and short-term government bonds, yield spreads between low grade bonds and high grade bonds, the lagged stock price-to-earnings ratio, and the lagged returns have some capability to predict the stock returns.

Chen et al. (1986) studied on pricing relative to a set of observable macroeconomic variables. This study suggested that the expected returns are a function of business conditions in the expected market premium which is negatively relating to the recent growth of economic activity representative for the health of the current economy. And it is positively relating to the expected future growth of economic activity and its conditional variance. In addition, Chen (1991) studies the relation between changes in financial investment opportunities and changes in the economy. This paper provides some additional evidences that variables such as the one month T-bill rate, the default spread, the term spread, the growth rate of lagged industrial production, and the dividend-to-price ratio are the most important determinants of future stock market returns. It can be interpreted the ability of these variables in order to forecast the future stock market returns in terms of their correlations with any changes in the macroeconomic environment.

Numerous studies related to accounting finance investigated the empirical relation between stock market values and particular accounting numbers or financial ratios. Consistent supports that these numbers has a significant power for a cross-sectional stock returns and especially associating to the stocks market values for a long term. Fama and French (1991) demonstrate that the ratio of book value –to- market value explains the differences in stock returns better than beta done, and suppose that its size and book –to- market ratios are proxies for other fundamentals. In additional research in 1992, show a significant relation between firm size, book –to- market ratios, and security returns for non-financial firms. Moreover, Barber and Lyon (1997) analyzes the returns for a

sizable holdout sample of financial firm which Fama and French (1992) exclude from their analysis. This research reveals that the relation between firm size, book –to- market ratio, and stock returns is similar for financial and non-financial firms. That is, firm size and book –to- market ratios have similar meanings for both firms at least as they relate to stock returns. The accumulated evidence indicates that firm size and book –to- market ratios explain in an economically meaningful way cross-sectional variation in security returns. In this juncture, the critical issue which remains unresolved is whether size and book –to- market are proxies for unidentified risk factors as suggested by Fama and French (1993 & 1996) or stock mispricing as suggested by Lakonishok et al. (1994).

Several studies have examined the cross-sectional relation of stock returns and fundamental variables such as earnings yield, cash flow yield, book –to- market ratio, and firm size have been achieved to have some capability in the stock returns forecasting. Basu (1977), Fama and French (1992), Davis (1994), Lakonishok et al. (1994) are examples of such cross-sectional studies. These studies in general find positive relationship between stock returns and earnings yield, and between cash flow yield and book-to-market ratio, and a negative relationship between stock returns and size.

Moreover, Chan et al. (1991) was studied relatively the cross-sectional differences in returns at Japanese stocks market due to the underlying behaviors of earnings yield, cash flow yield, book-to-market ratio, and size. In time-series analysis, Fama and French (1993) was identified three common risk factors, the overall market factor, factors related to firm size and the fraction of book value -to- market value of equity which behave to explain the average returns on stocks and bonds.

There are many empirical evidences belong to the valuation models. Wilcox (1984) proposes a valuation model relating the P/B ratio to the expected growth in book value of equity and suggests that the P/B –to- ROE model appears to be superior to P/E valuation model.

Bernard (1995) was examined to gauge the value relevance of accounting data. He has been compared the explanatory power of a model in which stock price is explained by book value and earnings versus a stock price model based upon dividends alone. This study found that the accounting variables dominate dividends which can be interpreted as ensuring the benefits of the linkage between accounting information and firm value.

Burgstahler and Dichev (1997a&b) has developed and tested an option style valuation model and find that the relevance of earnings versus book value varies by return on equity. The pooled cross-sectional changes in earnings are utilized to examine for earnings management and to estimate the pervasiveness of earning management. They observe these practices which are more prevalent among medium and large sized firms. Their studies detect that firms manage earnings to avoid reporting earnings decreases with statistical tests and earnings losses with visual evidence (without statistical tests). Further, Brief and Zarowin (1999) compare the alternative valuation models that studied on the value relevance of book value and reported earnings versus book value and dividends. They found that book value has greater explanatory power for price than either earnings or dividends, for only dividend paying firms on a whole. Furthermore, Zhang (2000) was examined how conservative accounting affects the relation between accounting data and firm value. The proposition explains that conservative accounting can be characterized equivalently in terms of book value, earnings, or book rate of return.

In empirical researches depend on firm size, Maroney and Protopapadakis (2002) tested the returns association between the book-to-market ratio and firm size effects with a general Assets Pricing Model in the large stock market for seven nations. They find that the stock returns have a positive relation with the book-to-market ratio and a negative relation with its size. For more information of firm size, Kim et al. (2003) has been examines the effect of firm size on corporate earnings management. Empirical evidence that both large and small sized firms manage earnings to avoid reporting small negative earnings or small earnings decreases. Finding small firms engage in more earnings management that large or medium sized firms to avoid reporting losses. On the other hand, large and medium sized firms exhibit more aggressive earnings management to avoid reporting earnings decreases than small-sized firms.

Omura (2005) has studied the value relevance of reported accounting numbers and behavioral returns with five Japanese firms during 1950 to 2004. The significant finding shows that the book value of equity has relevance with market value in the long run for each examined firms. In other market, Pourheydari et al. (2005) investigate the value relevance of earnings and book values over time for stocks listed in Tehran Stock Exchange. They find that the combined value relevance of earnings and book values is through of reported earnings. An incremental value relevance of reported earnings is higher than book value, and book value has a little explanatory power in equity valuation. Additionally, Landskroner et al. (2006) tested the developed equity valuation by empirically

using the five largest Israeli banks. This study summarizes that its market-to-book ratio reflects to the combination of return and risk determines the future values of the bank. This finding supports the efficient market hypothesis that the market-to-book ratio reflects risk of equity and also discovers the positive relationship between charter value and economic activity.

Research on a relevance of stock returns and its dividends, academic studies in the log-linear cointegration (LLCI) model consistent find that both dividend yields and book-to-market ratios have some predictive power for stock returns such as Fama and French (1988&1993), Campbell and Shiller (1988), Hodrick (1992), Pontiff and Schall (1998), Vuolteenaho (2000, 2002) Ali et al (2003a). However, the assumption of stationary both variables are often suspected. If so, they may share a common trend and a linear combination of these variables may by yield a better predictive power for stock returns. Because of book value is closely related to earnings then the cointegration between log book-to-market and log dividend yield seems consistent with the comovements or cointegration of earnings, dividends, and stock prices.

In a recent research, Hsieh and Hodnett (2011) find the effects of the book-to-market ratio and market capitalization to be pervasive in differentiating stock returns in each sector over the period from 1999 to 2009 under univariate test. Firms with relatively higher book-to-market ratio are found to outperform firms with relatively lower book-to-market ratio, but the firms with larger market capitalizations tend to accumulate negative abnormal returns over the examination period.

Phansawadhi (2012a&b) has proposed the alternative estimate based on accounting numbers of the cost of equity (COE) financing for valuing toward the intrinsic firms worth by employing the intrinsic worth valuation model. Empirical tests strictly support the investment behaviors that stockholders are earning from an incremental in the potential worth of the company or growth in market value, for any cases of no dividends firms. And find that return expectation is varying on the firm's fundamental information in the long run.

Despite of the overabundance of academic research and empirical evidence on the relationship between relative valuation and stock returns, relatively shortage explanation has been proved in financial mathematical factors which can be define these expressions. By this reason, this literature seeks to comprehend the general relevance or impact of conservative accounting on the relation between accounting variables and firm value by using the fraction of COE –to- ROE. In the relation of return demand and return supply, researcher attained the equilibrium condition in common equity. After that, this paper will be discussed about the relationship between stock market value and financial numbers in terms of financial mathematical equation. Included, explains how to adapt these relations in order to apprehend the balancing condition, also to determine the overpricing situation or underpricing situation of equity worth.

2. The Equilibrium in Common Equity

The proposition for alternatively estimating the cost of equity financing (k_t) basically assumes that it reflects from a firm's operating results generates again from the stockholder's equity during constantly interest period, which these operations have absorbed all systematic factors appropriately, including the systematic risk in the stock market impacts through the variance of its price movements depending upon the information available. The basic format related to additional study analyses the sensitiveness of all COE estimate formulas, requires that the current cost of equity financing (k_t) for a stock calculates from the arithmetical operation of the current net income, minus by a change in book value, and plus a change in market value of common equity, then resulting divided by a previous period of fair market value.

$$k_t = \frac{NI_t - \Delta BV_t + \Delta MV_t}{MV_{t-1}} \quad (1)$$

The following equation is revealing the cost of equity financing –to– the return on equity ratio at the same period that measures a company's actual profitability against the investors of return expectation from their investing in shares of the company. This ratio represents how much a firm's profit generates with the capital which stockholders have invested, compares to their prospect of the firm's profitability during the same consider period. In other word, this is a relation of returns demand which comes from investors, and returns supply which comes from a firm's actual performance.

$$\varepsilon_{i,t} = \frac{k_t}{ROE_t} = \frac{NI_t - \Delta BV_t + \Delta MV_t}{MV_{t-1} * ROE_t} \quad (2)$$

Where, $\varepsilon_{i,t}$ = the cost of equity –to– the return on equity ratio at period k_t for a stock i

k_t = the cost of equity ratio at period t

ROE_t = the return on common equity ratio at period t

NI_t = net income for period t

ΔBV_t = change in book value of equity between the ending and beginning period t

ΔMV_t = change in market value between the ending and beginning period t

MV_{t-1} = market value at the beginning period t

The ROE quantity in the equation (1) should be a return on common equity ratio that is the proportion between the net income which after dividends paid to preferred stocks and the book value of common equity at the beginning period (does not include preferred stocks).

$$\varepsilon_{i,t} = \frac{NI_t - BV_t + BV_{t-1} + MV_t - MV_{t-1}}{NI_t * (MV_{t-1}/BV_{t-1})} \quad (3)$$

The clean surplus relation (CSR) is a proposition of normative accounting which states a firm's book value should be changed only by earnings or dividends (Feltham & Ohlson, 1995; Lee, 1996). It defines that the change in book value of equity is equal to net income minus dividends at the interest period. That is, the net income by subtracting the change in book value as expressed in the formula above becomes total dividends for that period.

$$D_t = NI_t - BV_t + BV_{t-1} \quad (4)$$

We can manipulate the result as shown in the equation (4). That is, the common equity equilibrium is a direct proportionality of total investment gains versus a company's actual profitability. Its format generally requires a previous period of market value –to– book value ratio multiplied by the equity equilibrium constant (ε) of considering period, is equal to the change in market value of equity added to total dividends, the result divided by net income.

$$\varepsilon_t * \left(\frac{MV}{BV}\right)_{t-1} = \frac{D_t + MV_t - MV_{t-1}}{NI_t} = \frac{1}{NI_t} * (\Delta MV_t - \Delta BV_t) + 1 \quad (5)$$

Also, the equation (4) can generate into a common term of unit per share as shown in the following.

$$\varepsilon_t * \left(\frac{P}{B}\right)_{t-1} = [DPS_t + PPS_t - PPS_{t-1} * (TS_{t-1}/TS_t)]/EPS_t \quad (6)$$

In case of no change in number of common stocks during considering period, the equilibrium in common equity occurs when the equity equilibrium constant (ε) times a previous period of P/B ratio is equate to the rational between a change in market price added to dividends paid per common stock versus earnings per common stock.

$$\varepsilon_t * \left(\frac{P}{B}\right)_{t-1} = \frac{DPS_t + \Delta PPS_t}{EPS_t} = \frac{1}{EPS_t} * (\Delta PPS_t - \Delta BPS_t) + 1 \quad (7)$$

Where, ε_t = the equity equilibrium constant at period t for a stock i

$(P/B)_{t-1}$ = the market value –to– book value ratio at period $t - 1$

DPS_t = dividends per common share at period t

ΔPPS_t = change in market price between the ending and beginning period t

EPS_t = earnings per share for period t

In aspect of fundamental analysts, the information is composed of a firm's fundamental factors related information and other one is combined environmental information. The completed informative situation occurs when the firm officially distributes to public the fundamental information of its operating results which just ending. In the truth, there normally is not at the ending date of operation. By this reason, we can find the equity equilibrium constants (ε_t) for each periods in the past. The illustration in Figure-1 exhibits the infinite

horizontal change in market value of equity for general public firms.

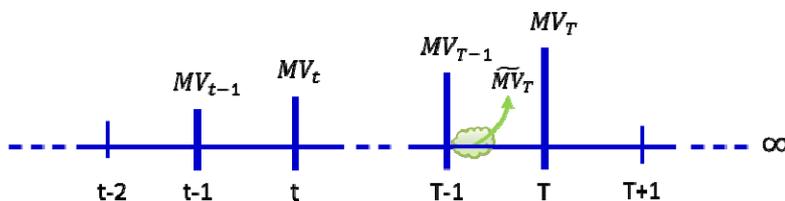


Figure 1. Infinite-horizontal change in market value of equity

The prospective information is processed from other resources available which are unofficially related to the fundamental of an interesting firm. At wherever is the completed informative situation, the market acknowledges the fundamental value and assesses through the efficient informative infected market value (MV_t) at time, or abbreviate called as fair market value adjust. In finance, the market value of equity sometime called market capitalization. Denotes that the fair market value adjust (MV_t) is possibly balancing, underpricing, or overpricing to its intrinsic value (V_t) at same time.

3. The Present Equilibrium in Common Equity

During the current period T , market value (\widetilde{MV}_T) qualifies as dynamic factor which is fluctuating within operating period causing the investor’s unstable expectation held against the firm’s future benefits and its prospective profitability rely on the information available.

The equity equilibrium constants (ε_t) for the current period T can be estimates through the predictable accounting numbers with the fundamental information available and the current market value at considering time.

$$E[\varepsilon]_{i,T} = \frac{E[NI]_T - E[BV]_T + BV_{T-1} + MV_T - MV_{T-1}}{E[NI]_T * (MV_{T-1}/BV_{T-1})} \tag{8}$$

$$E[\varepsilon]_{i,T} = \frac{E[D]_T + MV_T - MV_{T-1}}{E[NI]_T * (MV_{T-1}/BV_{T-1})} \tag{9}$$

Where, $E[\varepsilon]_{i,T}$ = the estimated current equity equilibrium constant for a stock i

$E[\dots]_t$ = the expected accounting numbers

Hence, the estimate of current common equity equilibrium can be manipulated inbelow.

$$E[\varepsilon]_T * \left(\frac{MV}{BV}\right)_{T-1} = [E[D]_T + MV_T - MV_{T-1}]/E[NI]_T \tag{10}$$

$$E[\varepsilon]_T * \left(\frac{P}{B}\right)_{T-1} = [E[DPS]_T + PPS_T - PPS_{T-1} * (TS_{t-1}/TS_t)]/E[NI]_T \tag{11}$$

4. The Relationship of Current and Past Market Value

By the truth of behavioral investment, that is the investors reasonably expect to earn money from their investment in shares of a company through both or either its dividends and prospective increment in market value of equity (market capitalization) which is directly proportional to market price.

We can rearrange the common equity equilibrium formula as discussed in the equation (4), to study a direct relationship between a previous period of market value and current market value. That is,

$$MV_{t-1} = \frac{MV_t + D_t}{(1+k_t)} \tag{12}$$

Its relation requires the investment benefits of both market value and dividends divided by a single return amount of current period. In other words, a previous period of market value equalizes to the one period present worth of its current market value added to total dividends for the same considering period, by employing the discount rate as that period's cost of equity financing (k).

$$MV_t = (1 + k_t) * MV_{t-1} - D_t \quad (13)$$

$$PPS_t = (1 + k_t) * PPS_{t-1} * (TS_{t-1}/TS_t) - DPS_t \quad (14)$$

With this relationship, it defines that the current market value is equal to the one period future worth of its past market value minus total dividends of current period as expressed in the equation above. Both equations is a linear relationship that describe in a graphical format where the past market value which is the independent variable, is multiplied by a single return amount of current period serves as the slope coefficient, subtracted by a constant total dividends, to determine the current market value. The following graphics are expressing the relationship between a previous market value and current market value of equity.

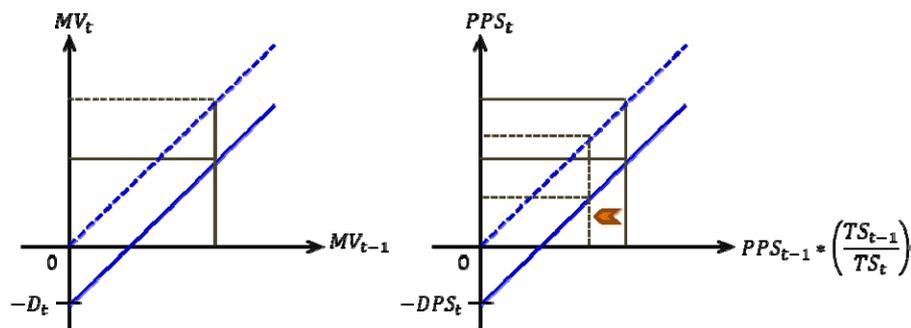


Figure 2. Linear relationship of one different period market value

Consistent evidences that in case of no dividend firms should be having the market value of equity higher than dividends paid firms when considers with the same cost of equity, which the quantity of COE is measures the requirement or expectation degree of stockholders held against a firm about the potential benefits from their investment (Phansawadhi, 2012b).

Additionally, in case of a company has the issuance of additional shares or the conversion of convertible securities, the issued number of shares must be reduce the earnings per share of common stocks which indirectly impacts on the reduction of market price per share.

Moreover, this is a way for estimating the present market value (MV_t) by utilize the one different period market value relation.

$$MV_T = (1 + E[k]_T) * MV_{T-1} - E[D]_T \quad (15)$$

$$PPS_T = (1 + E[k]_T) * PPS_{T-1} * (TS_{T-1}/TS_T) - E[DPS]_T \quad (15)$$

Orequally in arithmetic,

$$PPS_T = (1 + E[k]_T) * PPS_{T-1} - E[DPS]_T \quad (16)$$

When no change in total number of common stocks.

Where, $E[k]_T$ = the estimated cost of equity for present period

$E[\dots]_T$ = the expected numbers of total dividends or dividend per share

Which the estimates of the cost of equity financing for present period ($E[k]_T$) can be execute through

summarized statistics or graphical methods in order to find a suitable estimation for each firm or stock. It also needs to estimate this quantity when analyst works for valuing the equity worth served as discount rate in the intrinsic firm valuation model. The present COE estimate classifies as the direct and indirect methods.

The direct estimate of the present COE quantity is to forecast each related accounting numbers and fair market value adjust for the current period T which analyst can use some forecasting techniques to predict the present period of each required variables with the information available at time. For example, the simplest COE format is composing of the current total dividends -to- past market value ratio, plus the growth rate of market value (Phansawadhi, 2012a). Then analyst just puts reasonably the required total dividends and predicts how much its market value should be grow up or decline down based upon the fundamental information available.

The indirect estimate of the present COE quantity is to estimate approximately from the set of COE quantities in the past periods by using statistical methods which is depending on the pattern of a series COE. For example, the trendy variation pattern is present when a series exhibits steady upward growth or downward decline, should be determined by linear trend or stochastic methods. The seasonal variation is present when similar patterns of behavior are observed at particular times in the past, should be determined by autoregressive (AR) or moving average (MA) processes or a combined ARMA method, etc.

However, whilst the direct method might be suitable for when the accounting numbers such as net income, total dividends, growth rate of book value or market value, are predictable with the information available at time. The indirect method is acceptable or suitable for other cases according to no or insufficient fundamental information at considering points, especially when analyzing at the early period of operation.

5. The Relationship of Market Value and Financial Numbers

We can operate the common equity equilibrium equation (4) to transform into a term of market value relation which that format requires the net income of considering period multiplied by the coefficient function, added by the market value at the beginning period. The relationship between market value and net income qualifies as a linear function which has the slope coefficient settled as a linear function of the market value -to- book value ratio.

$$MV_t = \left[\varepsilon_t * \left(\frac{MV}{BV} \right)_{t-1} - d_t \right] * NI_t + MV_{t-1} \quad (17)$$

$$PPS_t = \left[\varepsilon_t * \left(\frac{P}{B} \right)_{t-1} - d_t \right] * EPS_t + PPS_{t-1} * \left(\frac{TS_{t-1}}{TS_t} \right) \quad (18)$$

Where, ε_t = the equity equilibrium constant for period t

d_t = the dividend payout ratio for period t

That is, it shows that how much the market values (or market prices) can be grow up during constantly periods which are directly associating to the net income (or earnings per share) available. In other words, the change in market values for a period can be finding from the net income multiplied by the coefficient function which is proportional again to the value of company.

Hereafter, considering the variable coefficient function that its linear expressions lets us know the current market value is relating to a previous period of the price -to- book ratio but it does not absolutely direct relation depending upon its equity equilibrium constant. That means higher P/B ratio should be drive the stock price more efficient than the firm held lower P/B ratio in regular by considering based on the same profitability and equity equilibrium constant. But sometime the price of stocks held lower P/B ratio perhaps grows better than higher P/B ratios, if they have a higher equity equilibrium constant.

Let τ be the function defined by the variable coefficient function in the linear equation of market value -to- book value relation.

$$\tau_t = \varepsilon_t * \left(\frac{MV}{BV} \right)_{t-1} - d_t = \varepsilon_t * \left(\frac{P}{B} \right)_{t-1} - d_t = \frac{\Delta MV_t}{NI_t} \quad (19)$$

The formula above can be expressed in a graphical format that suggests an algebraic relationship is proportional to a measurement of the firm worth by the P/B ratio, including the payment of any dividends entails a reduction in the τ number by its dividends payout ratio. By the way, the simplest format shows the proportional

change in market value –to- net income. That is, the increment or decrement in market value of equity varies directly with the firm’s profitability for each period.

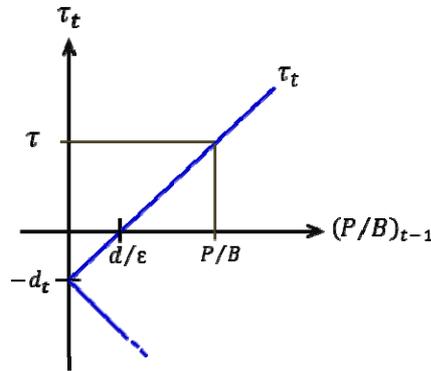


Figure 3. The slope coefficient function (τ_t)

By this reason, the relative equation of current market value and net income which had discussed in the equation (17) and (18) can be abbreviated as simple linear format below. And this is arithmetically equated to the equation (12) and (13), respectively.

$$MV_t = \tau_t * NI_t + MV_{t-1} \tag{20}$$

$$PPS_t = \tau_t * EPS_t + PPS_{t-1} * \left(\frac{TS_{t-1}}{TS_t}\right) \tag{21}$$

Where, τ_t = the slope coefficient function

In finance, dilution is a reduction in the percentage ownership of existing stockholders in a company caused by the issuance of additional shares or the conversion of convertible securities. Because of any increment in the number of stocks outstanding since warrants, stock options, convertible preferred stocks, convertible debentures, etc. rationally reduces the quantity of a company’s earnings per share (EPS). By use the equation (21), the following illustration explains the effect of diluted EPS with the steady market capitalization.

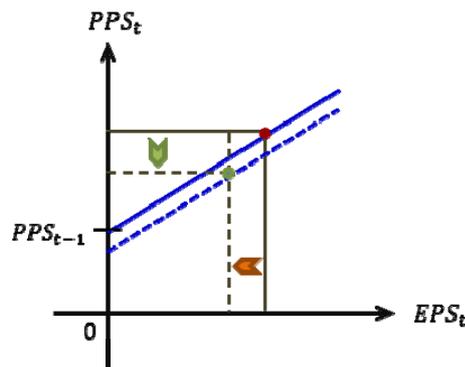


Figure 4. The diluted EPS affected against its market price

When the convertible securities of a company were exercised, then all serve to adding the number of stocks outstanding. This incremental amount makes an equilibrium line was downward shifted immediately and the equilibrium point must be move down in order to preserve the balance between the value of a firm’s earnings per share and its market price.

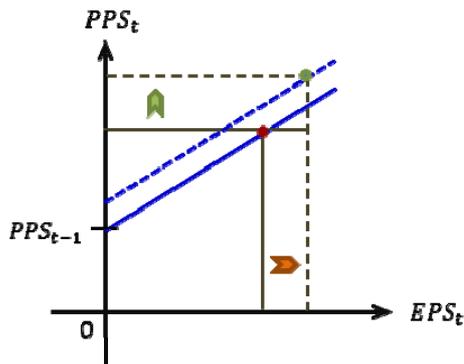


Figure 5. The concentrated EPS affected against its market price

In contrast, when the numbers of stocks outstanding are excessive and the company has many retained earnings which are beyond their capabilities to generate worthily more profits. The company can choose to purchase back some amount of common stocks to reduce the number of stocks outstanding. Because of any decrement in the number of stocks outstanding lets a profit performance metric used to measure the quality of a company’s EPS becomes higher reasonably. By these reasons, an equilibrium line was upward shifted and the equilibrium point must be move up, then its market price should increase respectively.

Moreover, we can transform the common equity equilibrium equation (4) into a term of the relationship between the different value of equity and the different of one period which that algebraic format requires the current period of the different market and book value of equity, is equal to the net income of considering period multiplied by the coefficient function, added by the different market and book value of equity at the beginning period. This relationship has the slope coefficient settled as a linear function of the previous price –to- book ratio.

$$(MV - BV)_t = \left[\varepsilon_t * \left(\frac{MV}{BV} \right)_{t-1} - 1 \right] * NI_t + (MV - BV)_{t-1} \tag{22}$$

$$(PPS - BPS)_t = \left[\varepsilon_t * \left(\frac{P}{B} \right)_{t-1} - 1 \right] * EPS_t + (PPS - BPS)_{t-1} * \left(\frac{TS_{t-1}}{TS_t} \right) \tag{23}$$

Furthermore, we can transform the common equity equilibrium equation (4) into a term of the relationship between the current P/E ratio and market value of equity which that algebraic format requires the current period of P/E ratio is equate to the inverse relative change in market value of considering period multiplied by the τ coefficient function.

$$\left(\frac{P}{E} \right)_t = \tau_t * \frac{MV_t}{\Delta MV_t} = \frac{\tau_t}{1 - (MV_{t-1} / MV_t)} \tag{24}$$

This graphical format explains the behaviors of P/E ratio affected from one period different market value (at the beginning and ending point). For examples of each positive τ numbers, the P/E ratio may be approachable zero, but certainly not equal to zero. The P/E ratio will be near the τ numbers when the current market value is extremely higher than a previous period of market value.

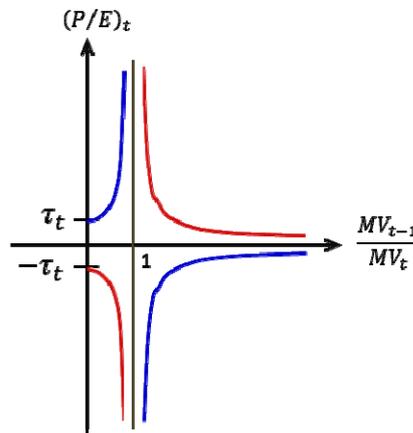


Figure 6. The relationship of the current P/E ratio and relational market value

Especially, several empirical tests found that the market value of equity relates to some accounting data such as dividends yield, market -to- book ratio, book value, and return on equity. The following equation consistent supports those empirical evidences with demonstrating these variables together. It format defines that the current market value equalizes one previous period of book value, multiplied by a specific linear relations of a previous period of price-to-book ratio and return on equity.

$$MV_t = \left[(1 + k_t) * \left(\frac{MV}{BV} \right)_{t-1} - d_t * ROE_t \right] * BV_{t-1} \tag{25}$$

Where, k_t = cost of equity financing

d_t = dividend payout ratio (represents instead of the dividends yield)

6. The Underpricing and Overpricing Determination Approach

The main purpose is to describe the common equity equilibrium in term of the relationship between current market value and predictable accounting numbers by using graphical methods to determine the behavioral stock that when is a better time for trading shares of the company. That meant acknowledgment when the market value becomes the underpricing or overpricing situation.

Determines the present period represents as T , Let X_i be the series data of the τ_t quantity for a stock i when $t = 1, 2, \dots, T - 1, T$.

$$X_i = \{ \tau_1, \tau_2, \dots, \tau_{t-1}, \tau_t, \tau_{t+1}, \dots, \tau_{T-1}, \tau_T \}$$

During the present period T , the estimated slope coefficient determines as $E[\tau]_T$ and its absolute error is given by,

$$| \tau_T - E[\tau]_T | = z_T$$

Then,

$$\tau_T = E[\tau]_T \pm z_T \tag{26}$$

When the Z_T quantity represents a combined toleration of the related variables in the equation (19), and the estimated slope coefficient function for present period should become as expressed in the following illustration.

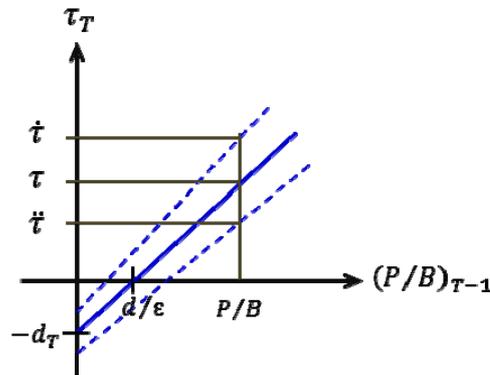


Figure 7. The slope coefficient function (τ_t) of present period

Dividends that will be pay during present period, overall or main part of amount regularly coming from the operating results of a previous period with the company's dividend policy. It is not difficult to expect probably the dividend payout ratio with the information available. Although, net income typically getting the impacts from several factors due to the nature of business, corporate strategy, threats and opportunities, and so on. But fundamental analyst can identify by the type of variation when its series exhibits either upward growth or downward decline or steady consistency. For any upward trends, might assume based on the information available that the expected net income for present period is greater than or equal to a previous period of net income.

$$E[NI]_T \geq NI_{T-1} \tag{27}$$

And also rewritten in term of absolute error as follows;

$$NI_T = E[NI]_T \pm n_T \tag{28}$$

When the n_T quantity represents an absolute error of net income

Here, recall the relationship of market value and net income of equity that its format in a form of present period is a direct variation of a previous market value (MV_{T-1}) added to the expected net income ($E[NI]_T$) multiplied by the estimated slope coefficient ($E[\tau]_T$).

$$MV_T = E[\tau]_T * E[NI]_T + MV_{T-1} \tag{29}$$

The introduced equation above can be illustrated the algebraic relation as graphical in the figure-8 that an upper line (UL) generates from a combination of positive tolerances in a while a lower line (LL) occurs from a combination of negative tolerances.

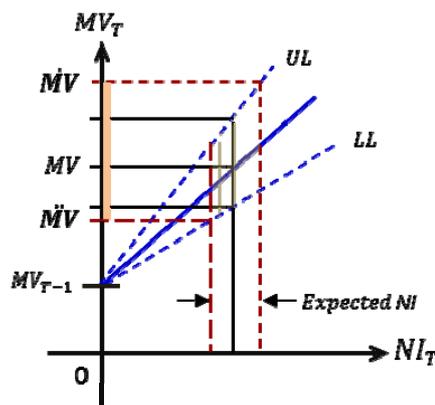


Figure 8. The conceptual balance of present market value

Generally, the balance of a firm's profitability and its market capitalization for a period t stabilizes at the intersection on common equity equilibrium line. In practice, analysts will acknowledged whenever the operation results have publicly announced already which there are quite delay for any reaction. To recognize the reasonable fluctuation of market value during this present period, the conceptual equality of market capitalization is a helpful method under the information available. The intersection of the smallest expected net income $((E[NI] - n))$ and the lower line (LL) presents the minimum acceptable market value $(\tilde{M}V)$ and the intersection of the highest expected net income $(E[NI] + n)$ and the upper line (UL) make knows the maximum acceptable market value $(\tilde{M}V)$. That is, if the present market value is still moving up or down within the interval of minimum and maximum MV, stockholders should reasonably hold shares of the company owing to a ready balance between its profitability and market capitalization.

By the way, if the present market value is reducing lower than the minimum MV, it becomes to the underpricing situation of market capitalization. Now investors should consider significantly for purchasing shares of the firm for potential capital gain in the near future. In contrast, when the movement of the present market value is higher than the maximum MV, this is expresses the overpricing situation of market capitalization which stockholder should consider significantly to sell shares of this company and the fundamental investor should avoid this stock because of these fact.

7. Conclusion

The concept of a common equity equilibrium is primarily ease to understand and helpful in order to describe the relationship between the return demand from whoever are investing in shares of a public company versus the actual return supply with its profitability. In general term, a format requires that the equality in common equity occurs when the equity equilibrium constant (ϵ) times a previous period of P/B ratio is equal to the fraction of a change in market value of equity added to total dividends $((D + \Delta MV))$ –to- net income (NI) at the same period. The summand in this equilibrium equation is jointly supplicating the possible return of investors held against their investments. While the denominator is really a company's capability in order to generate capital to be gains.

The proposition has discussed about the relation of current market value and past market value. Its relation generally defines that the current market value is equal to the one period future worth of its past market value minus total dividends of current period. This proves consistent evidence that in case of no dividend firms should be holding the market value of equity higher than dividends paid firms when considers with the same cost of equity financing.

The common equity equilibrium equation in term of current market value relative to net income is qualifying as algebraic function which has the slope coefficient serves as a linear expression of the market value –to- book value ratio. It shows that the current market values or market prices are directly varying to the net income or earnings per share available, respectively. Include, besides presents that the current market value is also relating to a previous period of the price –to- book ratio. That means normally higher P/B ratio should be drive the stock price more efficient than the firm has lower P/B ratio when considering upon the same profitability and equity equilibrium constant. But sometime the price of stocks held lower P/B ratios perhaps moves better than higher P/B ratios, if their have a higher equity equilibrium constant. In addition, this relationship can be absolutely explain the effect of dilution in earnings per share (EPS) caused by the issuance of additional shares or convertible securities. Including describes the behavioral market prices which impacts from the concentrated EPS due to any decrement in the number of stocks outstanding. However, no significant shows the direct relationship between the current P/E ratio and current market value.

Finally, this paper was proposed how to determine the underpricing and overpricing situation of market capitalization relying on the optimizing approach of a company's profitability and its market value. The aim is to recognize the reasonable fluctuation of market price during the present period by employing the conceptual equality of market capitalization. That is, if analyst acknowledges the reasonable market prices, then will apprehend when that market price of stock becomes the underpricing or overpricing. This is a helpful methodology in practice.

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