

An Empirical Study on Market Timing Theory of Capital Structure

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ABSTRACT

The theory of capital structure has advanced remarkably. This development began as many firms had options to consider various external factors determining the composition of debt and equity. Not only the asymmetric information or the conflict among bondholders and shareholders initiated the Pecking Order Theory and the Static Trade-off Theory respectively but also the overvalued or undervalued of stock price had to be taken as a determinant factor for identifying the ideal debt-equity mix. The author maintains these factors as they were pioneers to this theory on Market Timing Theory (MTT) introduced by Baker and Wurgler (2002). The essence of this theory is described when stock prices are overvalued, firms will finance projects through debts, otherwise the firms will be undervalued and be relied on equity financing. Using the methodology introduced by Baker and Wurgler (2002), the author selected only samples of IPOs of firms during 2008-2009 to limit the scope of this study. The main objective of this study is to test the hypotheses of Market Timing Theory formulated by Dahlan (2004) and by Kusumawati and Danny (2006) which have been proven by the GLS model, and the OLS model-like as in Baker and Wurgler (2002), Susilawati (2008) and Saad (2010). This study concludes that the market-to-book ratio has a negative effect on the market leverage. The implication is that when firms achieve certain level of earnings growth, the stock price will be overvalued, so it would be the right timing for firms to proceed equity financing. Under the robustness test with GLS Random Effect, the hypotheses of MTT is supported.

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The management of a company usually does not know when would be the optimal time for capital structure, let alone the investors in the capital market. This issue may become even more complicated if the management must decide the determinant factors to determine the most appropriate time for structuring the company's capital. The rationale from Elliot, et al. (2004) no longer prevails i.e. what portion of leverage should be maintained to achieve optimization. Theories on the traditional capital structure such as the Pecking Order Theory (POT) and the Static Trade-Off Theory (STT) have not satisfied financial managers in deciding the best capital structure policy. In fact, both theories are competing with each other in determining the best proxy of the determinant factor. [see Frank and Goyale (2003) and Liu (2005)]. Both quantitative-minded STT theories emphasize more on the optimal leverage to secure the firm from any financial distress while the POT focuses on optimum priority in capital issuing. On the other hand, the psychological factor in capital structure decisions maintained by behavioralists such as Kant (2003) and Miglo (2010) is quite interesting to be considered. In the study by Graham and Harvey (2001), a psychological approach on capital structure was applied in a survey on CFOs in USA.

The Market Timing Theory (MTT) from Barker and Wurgler (2002) was expected to provide an "answer"; However, it is not as easy as it seems. The MTT proxy, in general is a market-to-book ratio namely for IPO cases. Many academicians as quoted by Huang and Ritter (2005) have criticized this proxy, because in general, the market-to-book ratio is an investment decision proxy, that is to determine whether the stock is under-valued or over-valued. Barker and Wurgler (2002) claims that market timing is a "cumulative outcome of past attempts to time the equity market". The two assumptions applied are: 1. Asymmetric information may vary in the capital market, therefore, most of rational management would be reluctant to make any adjustment on the

target leverage. 2. The management is confident in applying "timing" towards equity market. Barker and Wurgler (2002) were able to derive an empirical model of the MTT. However, this MTT of Barker and Wurgler (2002) generated pro and contra reactions from many academicians. The pro and contra responses were not based on the second assumption as initially presumed by the author, but more on assumption 1 which is related to the promptness of the management in making adjustment towards the target leverage. Based on the study by Huang and Ritter (2005), academicians that are "pro" for the MTT, among others are Welch (2004), Kayhan and Titman (2005) and Lemmon, et.al. (2005). Meanwhile those that are against the MTT are among others Leary and Robert (2005), Alti (2003) who is skeptical with the definition of the market timing of Barker and Wurgler (2002) and Hovakimian (2005). The pro and contra on the Market Timing Theory, according to behavioralists such as Kant (2003) and Miglo (2010), is due to the internal condition of the firm and external factors (capital market situation). Those that are in favor of MTT maintain that the capital market creates an investor sentiment whereas the internal condition of the company affects the management's action in making financial decisions. Meanwhile for those against the MTT, apply the opposite condition [see the study by Vasiliou and Daskalakis (2007)].

The leverage of listed companies in the Indonesian Stock Exchange (BEI), prior to the monetary crisis, experienced a sharp increase but after the monetary crisis, the leverage tended to fall. The author suspects that the macro external factors or the motivational factors from the management have played an important role. This is apparent from the banking deregulation in 1988-1992, at which era the government of Indonesia provided easy terms to establish commercial banks, which was welcomed by the conglomerate management. However, eventually many loans went bad and resulted in default since these loans were used by their own group and the 3C principles in loan provisions were unobserved.

Therefore, after the monetary crisis between 1998-2002 many commercial banks were frozen and taken-over by BPPN (government agency for bank restructuring). Meanwhile the conglomerate firms as the stockholders of the company had to restructure their debt and improve their efficiency. The phenomenon of firms that are actively trading in the Jakarta Stock Exchange during the monetary crisis has proven that it is not easy to apply an optimal capital structure target. The POT, STT and MTT theory is expected to provide a possible solution for the target leverage (Tobing, 2008). However, the leverage target cannot be determined by practical judgment alone but must be derived from an empirical study.

In consideration of the above, the author intends to conduct a test on the market timing of capital structure in Indonesia. There are two motivations for the author in conducting this test. Firstly, the MTT theoretical debate reconciliation such as the study by Alti (2003) and Hogfeldt and Oborenko (2005) [contra MTT] and the study by Kayhan and Titman (2005) and Wagner (2007) [pro MTT]. Secondly the research on MTT was only conducted four times in BEI by Kusumawati and Danny (2006) that emphasized the effect of long term capital structure persistence by applying the MTT method and the OCS (optimal capital structure/STT), meanwhile Dahlan (2004) focused on whether or not there is a policy for capital structure in Indonesia that is oriented towards MTT. In addition to the abovementioned research, there are also studies conducted by Susilawati (2008) and Saad (2010). The general objective of this research is to prove that MTT is applicable at BEI; while the specific purpose is: to analyze the market-to-book ratio against the leverage and analyze the effect on the control variables (other variables) such as net property, plant and equipment; Earnings after Tax and Total Assets over leverage. The urgent objective is to find an indicative proof of MTT applied in BEI, i.e. the value of market-to-book ratio will negatively affect the leverage. Logically, at the time the firm experienced high growth

(one of its proxy is market-to-book ratio), then the companies tend to reduce the loan (one of the proxy is a leverage). The reason for this tendency is that investors at that time in the capital market will under-value the company so that the cost of equity is less than the cost of debt. This condition usually happens when a company (that is experiencing high growth) launches its IPO. Meanwhile, the urgency of the specific objective is emphasized on finding an MTT control variable. There are other proxies from Baker and Wurgler (2002) and Huang and Ritter (2005) such as Net Property, Plant and Equipment; Earnings after Tax and Total Assets. The role of these variables in affecting the correlation between the market-to-book ratio and the leverage is interesting to be reviewed, since the market-to-book ratio variable cannot stand alone as a variable in a separate model. From Dahlan (2004), Kusumawati and Danny (2006) and Saad (2010), it has been identified that each control variable has the role as a leverage determinant in addition to the market-to-book ratio that is evident as the main leverage determinant to indicate the validity of MTT in BEI. Other control variables are EBIT, SIZE, Net Working Capital and Lagged-Leverage that differs in the level of significance and is one of the motives for the author's research.

This study has five limitations, **first**, the author does not apply a long range period of data such as the MTT studies in USA which on average covers a period of more than 20 years. The reason for this is that the author only focuses on the uniqueness of the data covering the period between 2008 and 2009. **Second**, since the period of this research is relatively short, therefore the author can not apply the panel data regression model (GLS). For this study, the author attempts to apply the OLS method based on the "parsimonisity" argument. **Third**, the author does not apply data from the financial sector since the leverage behavior is different from the other ordinary companies and since it is tightly regulated by the government. **Fourth**, the companies that are chosen as samples are companies that are not affected by the global

economic crisis i.e. companies that do not have export activities or do not have any accounts payable for imported raw material. **Fifth**, several non-leverage determinant variables to prove the MTT hypothesis are taken from earlier studies by Baker and Wurgler (2002), Dahlan (2004), Danny and Kusumawati (2006), Susilawati (2008) i.e. market-to-book ratio and other financial ratio. In the meantime, the financial constraint variable by Saad (2010) is not discussed since it may become biased in analyzing sample companies that are launching IPO while the IPO itself is in the growth phase.

The Development of the Capital Structure Theory

As depicted in figure 1, the author introduces the emerging market timing theory that also started from the conventional MM capital structure theory in the late 1950-s. Modigliani and Miller (MM) offered two propositions. The first proposition is related to leverage, **arbitrage** and firm value. Meanwhile the second proposition is related to leverage, **risk** and cost of capital. Berk and De Marzo (2007) stated that the two propositions at the end consider that leverage does not affect the firm value, although the main requirement is a perfect market such as no transaction costs, business risks are the constant, symmetrical access to information, rational and homogeneous expectations among the investors. We may all understand that the assumption of no relevant debt has caused a controversy, since there is evidence that with leverage, EPS will increase, in fact regardless of the leverage, there is a dilution of stock ownership. The author views that the key is the assumption of a perfect market.

After revisions on the MM theory, alternative theories such as the Pecking Order and Static Trade-Off were introduced that were based on the assumption of an imperfect market with asymmetric information and the financial distress due to debt usage. In figure 1, the author is stating that the Pecking Order and the Static Trade-Off is strongly dominating at a range of 60s to 80s.

The Pecking Order started from a survey that was conducted by Fortune 500 magazine that resulted in a rank of capital financing scheme. The respondents in the survey considered that capital derived from retained profit is considered as the least costly which is very relevant since the management does need to spend high opportunity cost to access principals (capital owners).

Meanwhile the Static Trade-off theory began popular after many financial experts discussed the issue of financial distress as a negative implication of debt usage. Based on the STT theory, the debt should be used at an optimal level so that the debt does not negatively affect the value of the company. An interesting observation is that there are a variety of ideal proportions for different industries, which leads to an “optimal leverage puzzle”. In the 1980-s and 1990-s, several researches on capital structure were conducted with reference to the STT and POT theory. In Miglo (2010), two study groups were noted, one that is pro and the other is against the POT theory. The group that was pro POT included Myers (1984), Baskin (1989), Allen (1993) and Adedeji (1998), meanwhile the contra group included Shyam-Sunders and Myers (1999) and Frank and Goyale (2003). Manurung (2004) stated that the pro and contra is due to the different research model that was applied. The OLS and GLS are always competing to be used as the best estimation model and using the industrial sector as a leverage determinant. GLS is only effective if the sample size is large (involving the industry) or in fact applying cross-nation data such as in the study by Mahajan and Tartaroglu (2007).

Since both theories -STT and MTT- still exist, therefore the author presents a scenario of POT and STT that inspired the conception of MTT. What is the reason behind the emergence of the MTT theory? Baker and Wurgler (2002) once said that the decision on capital structure is related to the company’s timing in the capital market. Since POT and STT cannot maximize the firm’s value, while MTT has a persistent character, it is expected that

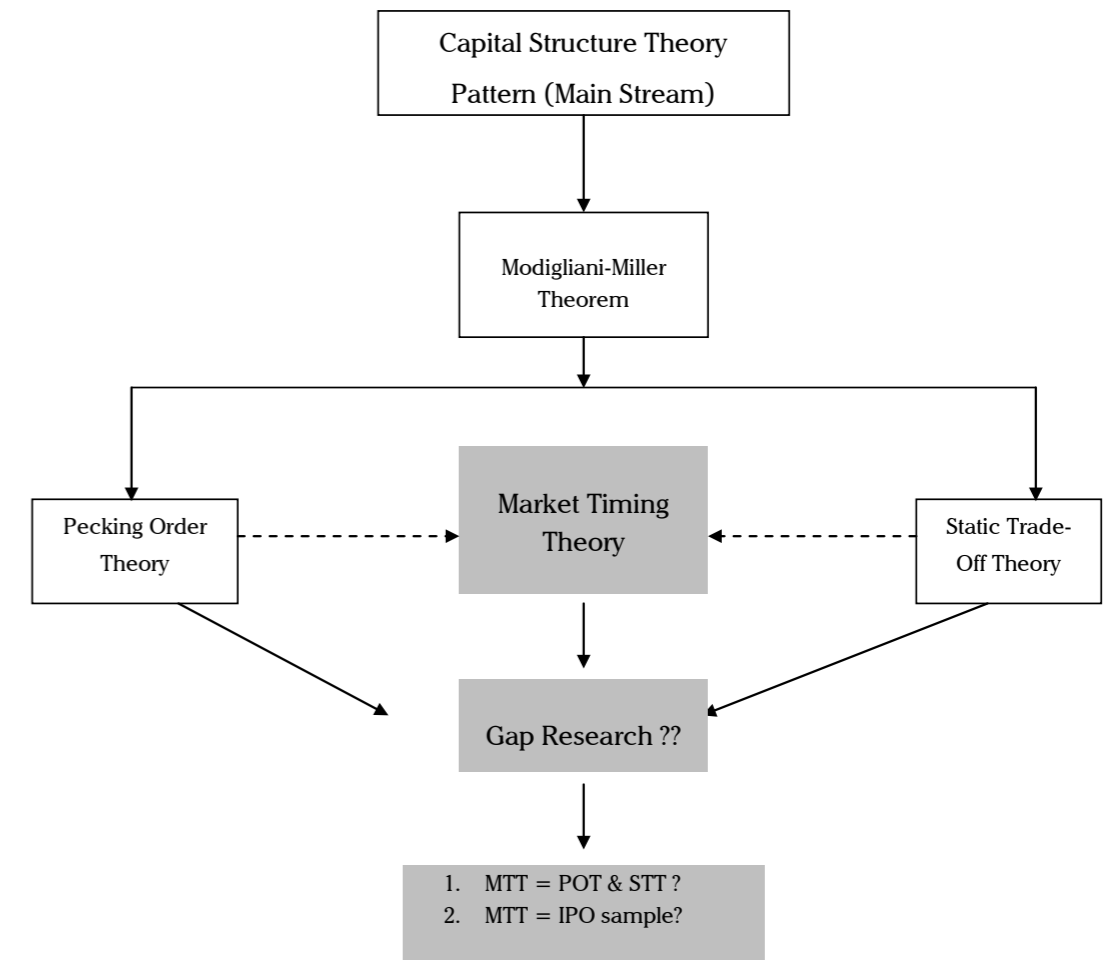


Figure 1. Map of the Capital Structure Theory
Built based on literature review (2010)

MTT can serve as an instrument to achieve financial goals. The key word “persistent” becomes a winning edge for MTT in its implementation. In the following section after explaining the details on POT and STT, the author shall discuss the MTT theory separately. However, similar to Alti (2003) who questions the persistence nature of MTT, the author also suspects that there are still many research gaps that are open for further study. The research gap is particularly on the reliability of MTT from Baker and Wurgler (2002) as a contemporary capital structure theory and the issue of MTT potentiality depends on the sample IPO company, since it is believed that the IPO will stimulate reaction from the investors such as the under-pricing phenomenon. As for non-

IPO companies, according to Baker and Wurgler (2002), the market-to-book ratio does not have any significant effect on leverage.

Static Trade-Off and Pecking Order Theories

In figure 1, the author describes in detail the POT and STT from 4 pillars, namely assumption, core, variable and research model. These 4 pillars were chosen to allow an easy approach in discussing the analysis on a theory by observing the elements of its methodology. In Table 1, the significant difference between STT and POT is shown. The POT theory emphasizes on the hierarchy of the funding, while STT focuses on optimizing the funding. Despite the significant difference, basically both theories focus

on Cost of Capital. The POT focuses on the lowest COC while STT focuses on the minimum COC that indicates the COC remains the main target in making capital structure decisions.

Some explanatory variables were taken by the author from the study by Pangeran (2004). The main model is the logistic regression (dummy variable) with “1” as a choice for equity financing and “0” for debt financing. As in the study by Pangeran (2004), the significant POT explanatory variable is profitability; stock price and the condition of the capital market with a positive orientation. However, since none of the STT explanatory variable is significant, Pangeran (2004) claims that POT is more relevant to be applied in Indonesia rather than STT. The author assumes that in 1991-1996, the data showed a bullish trend. Another interesting feature is that Pangeran (2004) adopted the explanatory variable POT and STT from Bayless and Diltz (1994) (see the italic print underlined in Table 1). If this is the case, then there is a cross-section or commonality between STT and POT. A deviation of the leverage target may occur due to the size of the offer and the stock price. The larger the size of stock offered, the lower the leverage target is. In contrast,

the higher the price of shares the higher the leverage target is, because companies would prefer to seek additional creditors rather than funding from the investor market that are intended for trading after IPO. If the company intends to find new investors then the investment would be through private placement procedure.

Market Timing Theory (MTT)

With reference to the study by Kusumawati and Danny (2006), the author could finally define MTT easily from an operational point of view. This is important since Baker and Wurgler (2002) only provided limited justification on the MTT, and this is not including other groups of researchers that are ‘for and against’ MTT which are occupied with the persistence characteristic of MTT through econometric only. From the study by Dahlan (2004) and Kusumawati and Danny (2006), the MTT shows that the implication of choosing the financing scheme whether through debt or equity at several points of time is more important than determining the optimum leverage. Saad (2010) noted two time references, namely the investors’ sentiment and the financial distress. In this study, the author does not apply the financial constraint since the

sample companies are companies that are not affected by the global economic crisis and if these companies were included then the result would be bias, because in the context of MTT, the element is: good reaction from investors.

Therefore, the MTT approach will focus on the activities in releasing the shares both at IPO or at SEO. Baker and Wurgler (2002), Huang and Ritter (2005) and Saad (2010) raised four arguments on the effectiveness of MTT as follows:

1. Firms tend to release shares as a substitute for debt when market price of their shares is higher than the book value and the past market value was already high; and they plan to buy back their shares when the market value declines.
2. By applying the estimation analysis on prospective earnings and estimation on the actual stock prices upon the sale of the shares, the company would tend to sell the shares at the time when investors are highly optimistic and enthusiastic.
3. If a company is experiencing a financial distress, then the priority for funding would be from debt, because under a bonding contract the management of the company would be more responsible and disciplined. If MTT is insisted to be applied, then the variation of the issuing could be through SEO or HMETD (for BEI).
4. The MTT approach should be applied at the time when the company is experiencing high growth within its product life cycle as this would attract market sentiment.

These two issues indicate the importance of identifying the shares whether they are over-valued or under-valued, when is the time the company sells the shares in the stock exchange. Another interesting observation is that upon releasing the shares, the capital structure is affected. Therefore, the MTT theory of the Baker and Wurgler (2002) version becomes apparent. If the selling of shares provides a better prospect, then there should be a negative effect toward the ratio of the market-

to-book equity and leverage. The study by Baker and Wurgler (2002) supports the findings from the study of Fama and French (2002) on this negative correlation; and in fact, they recommend on how the company should manage the optimum leverage with the market to book equity ratio (M/B). If the M/B ratio is low, a company with high leverage should sell their shares. In contrast, if the M/B ratio is high, the opposite should occur. Finally the author would like to discuss the correlation between M/B ratio and the leverage that tend to be reciprocal. Fundamentally, leverage and equity are opposites. This can be observed from the accounts in the liability; when debt rises, then leverage rises and therefore equity will decline. The debt rises when the company reduces its internal financing and turn to debt financing. Logically, if a company has a good debt rating, it is expected that the stock prices will also rise. However, based on the MTT assumption, it is the opposite when leverage is high, the stock prices will fall with the decline of the market value of the equity. This is due to the pessimistic behavior of the investors towards companies with high leverage even though the debt rating is good.

Academic Research on the Pro and contra towards Market Timing Theory

The pro and contra towards the MTT lingers around the persistence of the capital structure whether the capital structure is for long term or not. Results from the study of Baker and Wurgler (2002) has indicated the effect of persistence, namely the net equity issuance still exists. If the persistence effect still exists, the company should not have hastily made adjustment towards the leverage. In Huang and Ritter (2005), it is revealed that there are two groups –the pro and contra- MTT. The pro group include Welsch (2004); Kayhan and Titman (2005) and Lemmon, et.al. (2005). They claim by using non-IPO companies as samples, the persistence effect is still significantly strong up to 10 to 20 years. However, using almost the same samples, Leary and Robert (2005), Alti (2003) and Hovakimian (2005) found that the persistence effect diminished after several years after the IPO. So what happened?

Table 1. Comparative Study POT and STT

Remarks	POT	STT
Assumption	<ul style="list-style-type: none"> • Preference on Internal financing avoiding asymmetric information • Strict Policy on dividend (“sticky”) usually the parliament is lenient 	<ul style="list-style-type: none"> • Target leverage • Internal and external financing to maximize the firm’s value
Core	<ul style="list-style-type: none"> • Financing by observing the sequence of Cost of Capital • Cost of Capital (COC) that is low cost is mostly dominated by internal financing, 	<ul style="list-style-type: none"> • Financing to seek the optimal leverage ratio • Overuse of debt may pose the risk of bankruptcy due to the financial distress
Explanatory Variable	<ul style="list-style-type: none"> • Profitability • <i>Lot Size</i> • <i>Stock Price</i> 	<ul style="list-style-type: none"> • Business Risk • <i>Deviation from leverage target</i> • Volatility of revenue
Research Model	<ul style="list-style-type: none"> • Donaldson (1961) • Baskin (1989) • Bayless and Diltz (1994) • Allen (1993) 	<ul style="list-style-type: none"> • Stiglitz (1969); Haugen and Papas (1971) and Rubinstein (1973) • Bayless and Diltz (1994) • Frank and Goyale (2003)

Source: from the author’s analysis (2010) and the study by Manurung (2004) and Pangeran (2004)

The author has the opinion that the analysis method may be an issue; the data panel framework and new variable might be the trigger factor. Leary and Robert (2005) applied the GLS model maximum likelihood that is certainly more robust than the OLS model (Baker and Wurgler, 2002). Meanwhile Alti (2003) has included the hot and cold market elements at the time of the IPO in the data panel framework, despite using the same OLS model. At the end, Hovakimian (2005) included new variables such as size, tangibility and profitability besides M/B ratio; PPE/Asset ratio and EBITDA/Asset ratio in the study by Baker and Wurgler (2002). If the root of the problem is the definition of "persistence" that is "heavy" on econometrics, the author agrees with Huang and Ritter (2005). It is necessary to apply an appropriate analysis model. Apparently the panel data regression is the alternative to explain the persistence phenomenon. Huang and Ritter (2005) succeeded in proving the effect of persistence although it was rather weak.

The Author's View on Market Timing Theory

With reference to the above discussions, the author would like to design an MTT using the four main pillars such as assumption, core, explanatory variables and research model. If we talk about assumption, the author maintains that there are three leverage targets that are important, however achieving the optimal leverage is far more important. This depends on the equity issuance. Another assumption is that the company will experience a financing deficit, since it is not sufficient to depend on internal financing. Finally, other proxy besides cost of capital such as characteristics of the company and the market condition are also essential [Huang and Ritter (2005) have proven such]. As for the MTT core, the author has the opinion that companies should utilize equity when capital equity is less costly and on the other hand, the company should utilize debt sources when the debt financing costs are cheaper. Nevertheless, a company may be able to use a combination of both strategies if the cost for capital equity is the same as the cost for debt financing. This means that this

would induce an optimal capital structure. Another factor in decision-making for financing is the current condition of the company whether at the time of IPO or at the SEO. The IPO and SEO theory may affect the company's capital structure. If the explanatory variable is applied then the M/B ratio, EFWA M/B ratio, and the intensity of the fixed assets by Baker and Wurgler (2002) can all be applicable, provided that the variables of the M/B ratio and the EFWA M/B ratio have a negative effect towards the leverage. The study by Huang and Ritter (2005) was able to add other variables, the Equity Risk Premium, profitability, the size of the company, sales turnover and the net working capital and macro variables such as tax and GDP. These additional variables have broadened the findings of Baker and Wurgler (2002). The research model consistently refers to the OLS model by Baker and Wurgler (2002), even though the panel data regression model and the multinomial logit from Huang and Ritter (2005) are applicable but with a longer sample period.

METHODS

Research Procedure

First, the researcher collects data from companies actively trading in the stock exchange and that are registered at the Indonesian Stock Exchange. Second, the researcher collects data on the variables to be tested on each company. Third, the researcher applies an OLS regression by using the SPSS version 15.0 (hypothesis testing) and STATA version 9.0 (descriptive testing).

Data Source and Sample

The types of data collected by the author are from companies that launched their IPO between 2008 until 2009. The company data was downloaded from the site www.idx.co.id and www.finance.yahoo.com, and from the Indonesian Capital Market Directory (ICMD) 2009 and 2010. To ensure the validity of the data, the author cross-checked the data with the database of OSIRIS (PDEB FE-UI) in line with the study by Susilawati (2008) and Saad (2010).

Technique of Sampling

There were 52 companies including financial institutions that launched their IPO between 2008 until 2009. By applying the purposive technique, 28 companies were selected, of which 14 companies launched their IPO in 2008 and 14 companies launched their IPO in 2009. The criteria of the purposive sampling are:

1. The company does not fall under the category of highly-regulated financial sector.
2. The company was not delisted during 2008-2009, meaning that the company never experienced a negative profit or negative equity as a result from the global economic crisis of 2008. This means that the sample companies launching the IPO had a high probability in succeeding as they were not affected by the economic crisis.
3. The companies have complete financial reports particularly providing information on leverage ratio, number of stocks in circulation and stock price as of 31 December.¹

Definition of Operations and Correlation between Variables

There are two types of variables, free variables and dependent variables. A dependent variable is a leverage at which level the company's debt affects the company's capital structure. Furthermore, there are two leverage proxies: book leverage and market leverage. The book leverage is measured as the ratio between debt and total assets. Meanwhile, market leverage is calculated by dividing the total debt minus total equity multiplied by market capitalization and total assets. The free variable refers to the definition as defined in the previous studies. However, in developing the correlation between the free variable and the dependent variable, the author has made some modification which is explained in detail as follow:

1. Market-to-Book Ratio is the division between market capital value plus total debt divided by total assets. The market-to-book ratio is presumed to have a negative correlation with the leverage (H1) since at the time of the IPO the value of the market-to-book ratio was high, which induced the company to reduce debt. Saad (2010) claimed that the high market-to-book ratio is due to the positive sentiment from investors that were confident in the company's good prospect. If H1 is acceptable this means that MTT is applicable in the Indonesian Stock Exchange (BEI).
2. Net property plant and equipment is the book value of the fixed assets obtained which is the difference between the acquisition price subtracted by the accumulated depreciation of the current year. This is also presumed to have a negative effect towards the leverage (H2) since at the time of the IPO, the fixed assets were not used as collateral for debt financing. At the time of the IPO, there was an increase of fixed assets derived from equity funding from new shares issued.
3. Earnings after Tax is the net profit deducted by interest expenses and current year tax. This is presumed to have a negative effect towards the leverage (H3) since at the time of the IPO, the company was just experiencing profit growth. Therefore, the effect from the tax-shield due to debt utilization will begin to decline.
4. Total Assets are assets consisting of current and fixed assets. It is presumed that total assets have a positive effect towards leverage (H4). This reason for this, is that at the time of the IPO, there should be an increase in equity with the assumption that the debt level is constant. An increase in equity due to capital growth from new shares will eventually enlarge the company in terms of total assets.

1. Several non-financial companies were delisted from the samples since the data on their stock prices were too extreme to calculate the *market-to-book ratio*.

Analysis Model

The author's reference is the model by Dahlan (2004) that refers to the model by Baker and Wurgler (2002). The reason for the author in choosing the Baker and Wurgler (2002) model is that this model is often quoted by groups of researchers such as Susilawati (2008) and Saad (2010). Furthermore, the OLS model from Baker and Wurgler (2002) are parsimonive in nature, which is appropriate for short term period data for example for periods of less than 2 years. The analysis model is as follows:

$$\Delta BL_t = \beta_0 + \beta_1(M/B)_{t-1} + \beta_2 PPE_{t-1} + \beta_3 EAT_{t-1} + \beta_4 TA_{t-1} + \epsilon \quad (1)$$

$$\Delta ML_t = \beta_0 + \beta_1(M/B)_{t-1} + \beta_2 PPE_{t-1} + \beta_3 EAT_{t-1} + \beta_4 TA_{t-1} + \epsilon \quad (2)$$

Remarks:

ΔBL = Leverage Book Value stated as the difference/variance²

ΔML = Market Value Leverage also stated as the difference/variance

M/B = Market-to-Book Ratio

PPE = Net Property, Plant and Equipment

EAT = Earnings After Tax

TA = Total Assets

As stated in model 1 and 2, in order to have H1-H4 be accepted, the respective coefficient values are $\beta_1 < 0$; $\beta_2 < 0$; $\beta_3 < 0$ dan $\beta_4 > 0$. In addition, from a statistics point, each coefficient has a significant t-count value at a minimum level (p-value) 10 %. In order to have this model to be able to predict capital structure decisions in the future then, model 1 and 2 also should pass the classical assumption test.

RESULTS AND DISCUSSION

Descriptive Statistics

Based on the figures from Table 2, almost all the important variables in the model have unique characteristics. ΔBL and ΔML have unique differences. The market leverage value in general is higher than the book leverage value. This is in line with the explanation in Kusumawati and Danny (2006) regarding the two determinant factors i.e. the total equity reduction factor and capital market value addition factor. The negative value of the book and market leverage is due to the reduced debt in the sample companies that implicates the MTT hypothesis is accepted. Most of the MTT funding is from equity. Therefore Saad (2010) refers to the MTT as the Equity Market Timing (EMT).

Table 2. Descriptive Statistics [56 (28X2) observation IPO 2008-2009]

Variable	Mean	Std.Dev	Min	Max
Δ Book Leverage (BL)	-0.0178231	0.1501992	-0.5699379	0.4485325
Δ Market Leverage (ML)	-0.8324106	2.880701	-16.23754	4.833801
Market to Book (M/B) _{t-1}	2.183696	3.0960674	.02289079	17.69324
PPE _{t-1}	0.0982001	0.1580649	0.000103	0.723647
EAT _{t-1}	0.0026806	0.013	-0.033934	0.041606
Total Assets (TA) _{t-1}	0.2131082	0.2201024	0.020481	1.021668

Source: Analysis Results by the author (2010) early version with STATA 9.0

2. In the preliminary study, the result from the test with absolute value is not too encouraging. Therefore, the author decided to apply the *difference*. Since the author uses the difference for ΔBL and ΔML as a dependent variable, therefore all free variables apply model (1) and (2) stated in lag (t-1)

The free variables such as M/B, PPE, EAT and TA have similar data characteristics. Their standard deviation is higher than the mean (standard deviation > mean) due to some extreme sample data. These extreme sample data potentially may affect results of the hypothesis test, however, the effect may be insignificant if the number of samples is more than 30 as required by i.i.d (independent and identically distributed). To ensure the validity before analyzing the hypothesis test, it is necessary to check the correlation between the free variables in table 3. From this table, it is apparent that the delta market leverage variable has a significant

negative correlation with the market-to-book ratio at a level of 1% as an early indication of the validity of MTT. Besides that, it is also apparent that PPE_{t-1} and EAT_{t-1} variables have negative correlation with delta market leverage although it is insignificant. This indicates an initial support towards H2 and H3 which means that equity funding, that is in line with MTT, is valid when the profit growth is negative and there is no urgency to invest on fixed assets. However, this finding is not strongly supported by facts that the Total Assets has a negative correlation with delta market leverage, even though this does not apply for delta book leverage.

Table 3. Correlation between Free Variables with Pearson's Techniques

		ΔBL	ΔML	M/B	PPE _{t-1}	EAT _{t-1}	TA _{t-1}
ΔBL	Pearson Correlation	1	-.192	.101	.144	.312(*)	.233
	Sig. (2-tailed)	.	.156	.460	.291	.019	.084
	N	56	56	56	56	56	56
ΔML	Pearson Correlation	-.192	1	-.852(**)	-.228	-.243	-.152
	Sig. (2-tailed)	.156	.	.000	.091	.071	.262
	N	56	56	56	56	56	56
M/B	Pearson Correlation	.101	-.852(**)	1	.206	.147	.141
	Sig. (2-tailed)	.460	.000	.	.128	.280	.301
	N	56	56	56	56	56	56
PPE _{t-1}	Pearson Correlation	.144	-.228	.206	1	.360(**)	.953(**)
	Sig. (2-tailed)	.291	.091	.128	.	.006	.000
	N	56	56	56	56	56	56
EAT _{t-1}	Pearson Correlation	.312(*)	-.243	.147	.360(**)	1	.464(**)
	Sig. (2-tailed)	.019	.071	.280	.006	.	.000
	N	56	56	56	56	56	56
TA _{t-1}	Pearson Correlation	.233	-.152	.141	.953(**)	.464(**)	1
	Sig. (2-tailed)	.084	.262	.301	.000	.000	.
	N	56	56	56	56	56	56

* Correlation is significant at the 0.05 level (2-tailed).
 ** Correlation is significant at the 0.01 level (2-tailed).

Hypothesis Test Results

If we observe table 4, it is apparent that the acceptance of H1-H4 tends to be oriented to market leverage. In model 1 and 2, the coefficient value of the market-to-book was positive, which was against the MTT hypothesis. Meanwhile, the fixed assets variable and the total assets variable, in fact resulted in supporting the H2 and H4. While for model 3 and 4, the H1-H4 is acceptable. These results support the study by Dahlan (2004); Kusumawati and Danny (2006) and Susilawati (2008) and of course the research by Barker and Wurgler (2002). So, for the fourth time, the MTT theory is proven valid in BEI. However, it should be noted that the market-to-book ratio (t-1) would better fit with market leverage compared to book leverage, since the main component in calculating market leverage is the market value of total assets. Saad (2010) said that the prerequisite to apply the EMT (Equity Market Timing) is the market sentiment factor that is inherent in the market value of total assets. This means that investors in the capital market can

better control the optimal market leverage instead of the optimal book leverage. When the stocks are over-valued then the market value of total assets shall increase sharply which causes the investors to be reluctant to buy company stocks. If there is an urgent need for project funding, then the alternative debt-financing would be the best choice for a manager or if the company has a significant amount of retained profit, then this could be a source for internal equity funding. However, this alternative is not in line with MTT, since MTT is only relevant when the stocks are under-valued. Therefore, it is important to determine whether the stocks are over-valued or under-valued to indicate the validity of the optimal market leverage that will provide an indication to apply EMT or not.

From the econometrics view, model 3 is obviously “not feasible” as there is multi-co-linearity between $TA_{(t-1)}$ and $PPE_{(t-1)}$ with a limitation on VIF of more than 10. Therefore the author conducted another test using model 4 that is dropping $PPE_{(t-1)}$ and

$TA_{(t-1)}$. The result is the same, in which H1 and H3 are still acceptable and the multi-co-linearity has disappeared. Actually, to address the multi-co-linearity, the total assets proxy in model 3 can be replaced with sales. Therefore, only model 3 and 4 can be applicable as the basis to prove MTT, that is, when market leverage is used as the capital structure proxy.

Comparing the Models of Dahlan (2004) and Kusumawati and Danny (2006)

There are two models, namely the study by Kusumawati and Danny (2006) and the study by Dahlan (2004). Kusumawati and Danny (2006) were able to observe the MTT in Indonesia with a data sample of 400 observations between 1991-2001 for non-financial companies. The GMM model is presented below (the bold print refers to the significant variables):

$$BL = 0.0197 (M/B)_{t-1} - 0.0473 (EFWAM/B)_{t-1} + 0.0048 (PPE/A)_{t-1} - 0.1274 (EBITDA/A)_{t-1} + 0.0631 \ln(A)_{t-1} - 0.0019 (S/A)_{t-1} - 0.4537 (NWCA)_{t-1} + 0.0698 DUM_k$$

$$ML = 0.0306 (M/B)_{t-1} - 0.2946 (EFWAM/B)_{t-1} + 0.108 (PPE/A)_{t-1} - 0.0836 (EBITDA/A)_{t-1} + 0.0844 \ln(A)_{t-1} - 0.0061 (S/A)_{t-1} - 0.2291 (NWCA)_{t-1} + 0.0265 DUM_k$$

With this GMM model, Kusumawati and Danny (2006) were able to prove the MTT persistence effect although only based on a short period of time (1991-1995) and (1997-2001). Meanwhile, the study by Dahlan (2004) was able to introduce the MTT effect in BEI for non-financial companies (1990-2000). Similar to Kusumawati and Danny (2006), Dahlan (2004) also applied a dummy crisis variable and the GLS model. However, the major difference is that Dahlan (2004) emphasized on the market leverage variable that is not at its nominal level but based on the difference. The equation from Dahlan’s study (2004) is presented as follows (the bold print indicates the significant variable):

$$\Delta LEV_t = - 0.533 (M/B)_{t-1} - 0.098 PPE_{t-1} - 0.418 EBIT_{t-1} + 9.503 SIZE_{t-1} - 0.294 \Delta LEV_{t-1}$$

$$\Delta LEV_t = -0.51 (M/B)_{t-1} - 0.11 PPE_{t-1} - 0.418 EBIT_{t-1} + 10.414 SIZE_{t-1} - 0.283 \Delta LEV_{t-1} - 1.192 DCris_{t-1}$$

Based on both studies from Dahlan (2004) and from Kusumawati and Danny (2006), it is proven that MTT is applicable for BEI. However, there is a challenge in doing further research, i.e. identifying the interaction effect between the dummy crisis and the free variable and attempting to test MTT through a more simple model if in reality the number of sample is limited. Since the dummy crisis was not proven as a leverage determinant in Dahlan (2004) and Kusumawati and Danny (2006), therefore it is necessary for an alternative model to apply the robustness check. This model is important to test the persistence effect on MTT since Baker and Wurgler (2002) used IPO sample companies. Alti (2003) observed that IPO companies are prone to long-term under-performance phenomenon, that is, they would experience a decline in the market performance (stock prices) since many investors are selling the shares, which means companies can no longer apply the EMT. The model to test the robustness check is the GLS model that is adopted from model 3 (see table 4).

Results from Data computation on the Random Effect for Robustness Check Model 3

The simulation on the model with GLS random effect in Table 5, shows that all free variables including M/B (t-1) prove that MTT is significant. The results from the MTT hypothesis test applying the GLS model shows better results than the results from the OLS model in Table 4. This indicates that the MTT testing with data from Indonesia is more relevant when using the GLS, due to the wide range of variation of the leverage data, market-to-book ratio, EAT, PPE and Total Assets among the sample IPO companies. This wide range difference among the individual samples could not be detected by OLS. Therefore, several advance researches on MTT, after Baker and Wurgler (2002), have recommended the GLS model from fixed effect, random effect, GMM (General Methods of Moment) to SUR (Seemingly Unrelated Regression). These

Table 4. Results from the Hypothesis Test (Modified Model by Dahlan (2004))

Free Variable –Free Variable	Model 1 (dependent variable: Δ Book Leverage $_{t-1}$)	Model 2 (dependent variable: Δ Book Leverage $_{t-1}$)	Model 3 (dependent variable: Δ Market Leverage $_{t-1}$)	Model 4 (variable dependent: Δ Market Leverage $_{t-1}$)
Market to Book $_{(t-1)}$	0.0055903 (0.85) 1.12	0.0028761 (0.45) 1.02	-0.7463752 (-10.92)*** 1.12	-0.7771906 (-11.76)*** 1.02
PPE $_{(t-1)}$	-0.7493058 (-1.7)* 12.92	-	-7.802858 (-1.71)* 12.92	-
EAT $_{(t-1)}$	1.782002 (1) 1.44	3.398325 (2.23)** 1.02	-40.31233 (-2.18)** 1.44	-26.98061 (-1.72)* 1.02
Total Asset $_{(t-1)}$	0.6115446 (1.86)* 14.01	-	5.904876 (1.74)* 14.01	-
Intercept	-0.0915507 (-2.32)**	-0.0332131 (-1.39)	0.4133692 (1.01)	0.9370608 (3.8)***
F-Hitung	2.31*	2.78*	39.07***	75.12***
Adj-R²	0.0868	0.0609	0.7346	0.7294
D-W	2.36	2.188	1.805	1.866

Source: Analysis Results by author (2010) initial version with STATA 9.0

GLS models are capable to reduce the level of auto-correlation that is still often found in the OLS model that causes the adjusted-R2 to be low as presented in Table 4. With the GLS random effect model in table 5, all the MTT components have functioned well so that H1 to H4 is accepted, when the test on individual effect is conducted, 78.57 % of the samples fulfilled the MTT requirements. This finding is one of the advantages of the GLS model which can sort out which individual samples are in line with MTT or not. The test result by the author is still valid as it matches with MTT by more than 50%, that shows the decline of the market leverage. The argument is that when market leverage is correlated to the market-to-book ratio, then the market leverage must be low to meet MTT or EMT requirement.

MANAGERIAL IMPLICATION

One of the major issues in testing MTT is the dependency on the sample companies that launch IPO shares. The author has discussed this issue with colleagues and obtained explanation that IPO of shares is a unique company phenomenon which is the least costly for investors since usually IPO in the growth phase is within PLC. This supports the opinion on EMT, if more funding is achieved, the better the prices of share are, which are determined by the underwriter and the management. The EMT for a company is valid when the IPO company is successful (for example P.T. Krakatau Steel on 10 November 2011) and after IPO, the company will experience a long-run out performance. If the condition is met, then the assumption of persistence of the MTT shall still be valid and shall counteract Alti's concern (2003) on the inability of the long term MTT test, since many MTT researches failed to do so.

If a company plans to launch a second IPO for shares or launch an IPO for bonds, then is EMT or MTT still relevant? EMT depends on the negative correlation between the market leverage and the market-to-book ratio. If the context is debt, then the correlation only need to be reversed in which

the correlation is positive between the market leverage and the market-to-book ratio. However, the essence of MTT is slightly modified, i.e. the company shall increase leverage when the market-to-book ratio is still low. Adding the leverage will not change the context of EMT since the optimal market leverage is still relevant, and in this case the management still follows the static trade-off theory. When the context shifted to the second-IPO shares, then the EMT context is still oriented towards the negative correlation between market leverage and the market-to-book ratio, but the intensity of the relationship is not as strong as the IPO shares. The reason for this is that the market-to-book ratio is no longer at a minimum level, and therefore the company could not reduce its market leverage any lower or increase the equity ratio to higher levels since it will exceed the optimum level that may negatively affect the second-IPO. From this stand point, the dependency on stock IPO in the context of EMT can be addressed by shifting the sample of IPO for bonds or the second-IPO for shares provided that the optimal market leverage can be maintained any time by the management.

Once it is known that EMT or MTT can be applied not only when approaching a stock IPO, then the main duty of the management is to make adjustments any time to arrange the optimal market leverage. The process of adjustment is very important since it will determine the level of the market-to-book ratio that tends to have a negative correlation with market leverage. One of the applications of the theory on post-MTT is the dynamic capital structure that has an initial idea to seek the optimum level of debt derived from the difference of the tax reduction and the cost for potential bankruptcy by observing various parameters of the company's condition, such as free cash flow, ownership structure and long-term investment policy strategy. The adjustment process in the dynamic capital structure shall strengthen the essence of EMT since it will provide information for the management in determining the level of the negative correlation between the market leverage and market-to-book ratio particularly after the post

Table 5. Results from Testing the Hypothesis with Random Effect

Dependent Variable: ΔML
 Method: GLS (Variance Components)
 Date: 01/03/11 Time: 02:08
 Sample: 1 2
 Included observations: 2
 Number of cross-sections used: 28
 Total panel (balanced) observations: 56

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
C	0.388169	0.442444	0.877331	0.3844	} Proving Hypothesis H1 [M/B _{t-1}] okay(MTT) H2 [PPE _{t-1}] oke H3 [EAT _{t-1}] oke H4 [TA _{t-1}] oke
M/B _{t-1} ?	-0.795363	0.069572	-11.43219	0.0000	
PPE _{t-1} ?	-9.757771	4.704509	-2.074132	0.0431	
EAT _{t-1} ?	-41.12151	19.12292	-2.150378	0.0363	
TA _{t-1} ?	7.468921	3.557510	2.099480	0.0407	
Random Effects					
_AD--C	-0.386628		AD [ΔML] okay		} Proving the Individual effect in MTT if the intercept coefficient of each company is negative which means a decrease in ML and not an increase in ML. MTT is valid for 22 companies out of 28 or 78.57%.
_AK--C	0.121852		AK [ΔML] not okay		
_AL--C	0.149593		AL [ΔML] not okay		
_AN--C	1.788932		AN [ΔML] not okay		
_AR--C	-0.017650		AR [ΔML] okay		
_AS--C	-0.463395		AS [ΔML] okay		
_BE--C	-0.007910		BE [ΔML] okay		
_DA--C	-0.091657		DA [ΔML] okay		
_DH--C	-0.513837		DH [ΔML] okay		
_DY--C	-0.002466		DY [ΔML] okay		
_FO--C	-0.297117		FO [ΔML] okay		
_GO--C	0.023260		GO [ΔML] not okay		
_IN--C	0.120700		IN [ΔML] not okay		
_IO--C	-0.285217		IO [ΔML] okay		
_JA--C	-0.106931		JA [ΔML] okay		
_KA--C	-0.147442		KA [ΔML] okay		
_KI--C	-0.107705		KI [ΔML] okay		
_KR--C	-0.111906		KR [ΔML] okay		
_LA--C	-0.109086		LA [ΔML] okay		
_LP--C	1.061136		LP [ΔML] not okay		
_ME--C	0.294825		ME [ΔML] no okay		
_PL--C	-0.076533		PL [ΔML] okay		
_RI--C	-0.304147		RI [ΔML] okay		
_SU--C	-0.102310		SU [ΔML] okay		
_SY--C	0.546990		SY [ΔML] not okay		
_TP--C	-0.458469		TP [ΔML] okay		
_TU--C	-0.188501		TU [ΔML] okay		
_WA--C	-0.328380		WA [ΔML] okay		
GLS Transformed Regression					
R-squared	0.815696	Mean dependent var	-0.826750		
Adjusted R-squared	0.801241	S.D. dependent var	2.882119		
S.E. of regression	1.284917	Sum squared resid	84.20157		
Durbin-Watson stat	1.927935				
Unweighted Statistics including Random Effects					
R-squared	0.853762	Mean dependent var	-0.826750		Validation of Model: a. Level of R ² b. Tolerance D-W with figure 2.
Adjusted R-squared	0.842292	S.D. dependent var	2.882119		
S.E. of regression	1.144560	Sum squared resid	66.81090		
Durbin-Watson stat	2.429771				

IPO. If this is important as an IPO prerequisite, then the company may apply the early theory essence that is the optimum level of the book value leverage as a derivative from the initial idea of the static trade-off theory (STT).

CONCLUSION

Based on the results of "this small study", it shows that even applying the OLS model, the MTT hypothesis is accepted. This means there is enough room for other researchers who would like to try different sample periods and different industries. The author also sees that there is an issue on the familiarity of the regression of the data panel that should be considered. The author claims that the research results are better with MTT, provided that the data is taken from a long-term sample. Furthermore, in relation to the acceptance of the MTT hypothesis, the author observed IPO companies that were samples for the MTT hypothesis. There is a unique characteristic of the 2008-2009 IPO companies.

The price of their shares tend to decline after the IPO year and the reason for this phenomenon is that the investors are not yet in the position to seek profit (profit-taking); with the assumption that the level of debt shall increase and the stock price is one of the components of the market-to-book then it is obvious that the correlation between the market-to-book and leverage is negative. What is even more unique is that the character of the market-to-book is influenced by the EAT that negatively affects the leverage which is a medium-term under-performance post IPO phenomenon. In principle, the company's profit will tend to decline even though in the first year after the IPO, the trend was rising. The decline in profit was due to the management's action in paying the interest for the debt or to finance certain projects, which may be found in HMETD cases.

Therefore, the general objective of this research to prove the validity of the MTT of Baker and Wurgler (2002) was achieved for the IPO cases (in 2008-

2009) in BEI. The results from the research of the author supports the findings of Dahlan (2004), Kusumawati and Danny (2006), Susilawati (2008) and Saad (2010). Upon analyzing the specific purpose, all the determinants of the market leverage and the market-to-book, PPE, EAT and TA proven to have significant relations both when tested with OLS and GLS model with a high R2 value (over 70%). This indicates that the validity of the MTT of the Baker and Wurgler model (2002) with the 4 free variables as determinants for the market leverage can be applied at various conditions provided that the samples are IPO companies. If the companies were non-IPO companies, then it is necessary to add another relevant determinant variable such as a financial constraint measured by the Kaplan-Zingales Index [see the study by Saad (2010)]. Under a financial constraint, the market sentiment is negative, therefore, the companies should postpone the MET until the sentiment becomes positive.

Recommendation

There are two recommendations: first, the data gathering should be extended to test the persistence effect from the MTT, since this issue has been severely "attacked" by Altı (2003). The persistence effect is one of the characteristics that should emerge from MTT. However, this effect can only be maintained under short periods, meanwhile decisions on capital structure (MTT) are long term decisions. As a solution, the GMM from Kusumawati and Danny (2006) may be applied provided that the time frame should be at least quarterly. Second, testing on several groups of industry sector and the effect of the dummy global financial crisis interaction in the USA should be done for each industry sector. This is important to analyze the validity of the market sentiment from global investors in responding to the effectiveness of a company's MTT. They should not only observe information on financial issues to estimate the market-to-book value but also observe information on non-financial issues such as CGPI (Corporate Governance Perception Index) and CSRI (Corporate Social Responsibility Index). ■

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