

Stock Split Factors as a Signaling of Firm's Future Earning:
Empirical Evidence from the Stock Exchange of Thailand

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อัตราการแตกหุ้นในฐานะที่เป็นสัญญาของกำไรบริษัทในอนาคต:
หลักฐานเชิงประจักษ์จากตลาดหลักทรัพย์แห่งประเทศไทย



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
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ในทางบัญชีการแตกหุ้นและการจ่ายปันผลหุ้นไม่มีผลกระทบต่อมูลค่าของบริษัทจดทะเบียน แต่ยังมีผลกระทบต่อพฤติกรรมเหล่านี้อยู่ทุกๆ ที่ไม่ทำให้มูลค่าบริษัทเปลี่ยนแปลง วิทยานิพนธ์ฉบับนี้ ศึกษาพฤติกรรมของบริษัทผ่านธุรกรรมดังกล่าว โดยเก็บข้อมูลจากตลาดหลักทรัพย์แห่งประเทศไทย ผลจากสมการถดถอยพบว่า ปัจจัยที่ส่งผลต่ออัตราการแตกหุ้นของผู้บริหารที่เป็นปัจจัยเชิงบวกมีดังนี้ ราคาหุ้น ความคาดเคลื่อนการประมาณการกำไรของนักวิเคราะห์ ผลการดำเนินงานในอนาคตของบริษัท และปัจจัยเชิงลบ คือมูลค่าตลาดของบริษัทจดทะเบียน ความคาดเคลื่อนการประมาณการกำไรของนักวิเคราะห์ ผลการดำเนินงานในอนาคตของบริษัทสะท้อนอยู่ในอัตราการแตกหุ้นของบริษัทจดทะเบียนซึ่งอาจจะสนับสนุนสมมติฐานการส่งสัญญาณ แต่เมื่อวิเคราะห์ผลตอบแทนผิดปกติในช่วงการประกาศแตกหุ้นและการจ่ายปันผลหุ้น ผลจากสมการถดถอยพบว่าผลตอบแทนผิดปกติในช่วงการประกาศแตกหุ้นและการจ่ายปันผลหุ้นสนับสนุนสมมติฐานด้านสภาพคล่อง และไม่พบสมมติฐานการส่งสัญญาณ



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Because there is no effect on the firm's value due to the stock dividend and stock split transaction (SD) in accounting viewpoint, it has been a puzzle over the incentives of the firm to make these transactions. In this paper, the stock split and stock dividend transactions are collected from stock exchange of Thailand. This paper find that split factor choice are increasing with share price, earning forecast error, operating performance improvement and decreasing with the firm's size. It can be concluded that management convey private information about future earnings via the split factor choice. Furthermore, after analyzing the relationship between the announcement return and the signaling by the firm, the study finds the positive relationship of them and the results suggest that investors may infer the firm value corresponding to the split factor choice. However, the forecast error and operating performance improvement, which use to be a proxy for the signaling hypothesis has no statistical association with return during the announcement. The result provides a strong positive association between SD announcement return and the 6-month liquidity improvement. It suggests that liquidity hypothesis has an explanatory power to explain the SD announcement return. The results imply that investors utilize the SD announcement as signal for the future liquidity improvement not for the signaling hypothesis.

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CHAPTER 1

Introduction

Background and Problem Review

Since the first stock dividends in Thailand were distributed in 1999 by Charoen Pokphand Foods PCL. (CPF) which announced ten additional shares per a unit of old share, such distribution seemed to unpopular among Thai listed firms as the average number of listed firms paying stock dividends was just about 6 firms per year in the next 5 years after the first distribution. However recently, the trend of stock dividend distribution among Thai listed firms has been changed and interestingly increased. Between 2010 and 2013, the number of company which pay stock dividends are 8, 18, 29 and 57 companies, respectively. In fact, the average number of stock dividend transactions obviously rise from 7 transactions per year during 2008-2010 to 34 transactions per year during 2011-2013. Contrary to the study of Lakonishok and Lev (1987) about stock splits and stock dividends in US firms indicating that a substantial decreasing in the frequency of stock dividend distribution and suggesting that such distribution is not productive to investigate, the incidence of

stock dividend transaction in Thailand is divergent to the trend in US market. This thesis aims to investigate the economic reasons why Thai firms pay stock dividend.

From the investor's viewpoint, the distribution of the firm can be by two forms namely cash and stock dividends. In perfect market, dividend irrelevance theory initiated by Miller and Modigliani (1961) shows that shareholders' wealth is not affected by the amount and form of its dividend distribution. From dividend irrelevance theory, in the frictionless markets assumption, the cash dividends have no effect on the firm's value because investors can simulate the cash dividends by their own. For example, from an investors' perspective, that a company's dividend is too large. These investors could then purchase more stock with the dividend that is over the investors' expectations. Similarly, if, from an investors' perspective, a company's dividend is too small, an investor could sell some of the company's stock to replicate the cash flow he or she expected to earn. In the perfect market, cash dividend and stock dividend yield nothing to firm's value. However, in reality, assumptions are broken down and thus market is imperfect, firm may pay or even

adjust dividend in order to signal the outside public investors. Due to the different form of distributions, the impacts on firm's value of the cash dividends and stock dividends are significantly different. Note that in Thailand, cash dividend is subject to income tax, but capital gain is not. Cash dividend means fund flows out from the firm, but with stock dividend, fund is kept within the firm. Still, a question remains, that is, if firms want to keep money, why they bother to pay stock dividend at all. In this thesis, the form of dividend payment namely stock dividends is analyzed to find the incentives behind the firms' behavior.

Various types of capital market imperfection (such as, transaction costs, tax, information asymmetry, etc.) have been used to explain why dividends matter to shareholders. One interesting aspect of the imperfection is information asymmetry. Between firms and outside investors, Miller and Rock (1985) show that a firm's manager are assumed to know better about true value of a firm and lead to the information asymmetry problem. From Bhattacharya (1979), John and Williams (1985) and Miller and Rock (1985), a firm employs dividend decision to be a signal to

convey the positive information about itself to the public, particularly about future earnings. A higher-value firm tries to distinguish themselves from lower-value firm by conveying the favorable information or signaling to the public such as paying cash dividend, smoothing dividend payout and repurchasing stock. The higher degree of information asymmetry of a firm with outside investor is, the greater discounting rate is used to compensate for being uninformed. Hence, a firm with high degree of information asymmetry is likely to have incentives to use dividends to signal outside investors.

It is common in the extant literatures to study stock dividend transaction together with stock split. They treat both stock split and stock dividend as the equivalent transaction. From accounting aspect, firm market valuation does not change due to stock dividends and stock splits, given other things remain the same because both transactions increase number of share outstanding dilute the share price and nothing changes for the shareholders' proportional ownership of shares. Unlike cash dividends which has directly effects on future cash flows of the firm, and

thus could signal a change in firm's value, both stock dividends and stock splits seem to be just a cosmetic accounting change with no change in asset structure and no direct cost. Therefore, it is not clear from how both transactions provide benefit the firm's value and shareholders' wealth.

When a firm has a stock dividends, an amount of these new shares is transferred from retained earnings to the permanent capital of the firm, assuming that the market price is not less than the par value. Stock splits also increase number of shares outstanding with proportionally decreasing in par value of a firm. Both have no effect on shareholders' wealth and proportional ownership; thereby, all other accounts such as cash, interest charge, cash dividends and proportion of ownership or even firm value theoretically remain the same. Moreover, in the long run, stock dividends and stock splits has no role in efficiency improvement in production since assets of a firm are unaffected. Therefore, there is no reason for market value of a firm to change by being solely influenced from a stock dividend.

There are studies the impact of stock dividend and stock splits on firm market value and they find stock dividends and stock splits increase in a firm's stock price at the announcement. The reasons for stock dividend are from signaling and optimal trading range. Bhattacharya (1979) studies asymmetric information between managers and investors, that managers have an incentive to deliver favorable information to investor and low-valued firm cannot mimic the financial decision of high-value firm because of being costly. For stock dividends, the value of new distributed shares is transferred from retained earnings to firm's capital account. Referred to the retained earning hypothesis, if a firm confronts both financial and legal constraints such as legal restrictions, stock exchange rule or bond covenants written in terms of retained earnings, the stock dividend distribution can limit a firm's ability to pay cash dividend in the future. Consequently, firms which are expected that earning will increase are not conditional on the restriction, and thus, it is not costly to firms to reduce retained earnings. However, firms which are expected to have poor earning cannot mimic the signal of higher-value firm via stock dividend because it is costly for the

lower-value firm to deduct retained earnings to pay stock dividend. In conclusion, there are evidences that stock dividend can be a proxy of higher-value firm.

Even though stock dividend and stock splits yield nothing to a firm intrinsic value, firm managers still pay stock dividends and split stocks to shareholders. It is therefore interesting to investigate why firm managers choose to distribute stock dividends and split stocks as they provide nothing to a firm value. From a survey of chief financial officers of New York Stock Exchange, Eisemann and Moses (1978) asked detailed questionnaires to both CFOs who choose to pay stock dividend and CFOs who do not utilize stock dividend as a firm distribution. The results are controversial among CFOs. For supporting evidence of stock dividend, CFOs review benefits of stock dividend, firstly making stock more attractive because it increases the number of shareholder and liquidity, secondly reducing shareholder's tax and thirdly conserving cash with a firm. On the contrary, another group of CFOs argues that stock dividend make stock unattractive since, for frequently stock dividend, institutional investors are eliminating from handling cost. Barker and Gallagher (1980) surveyed

CFOs of firm which split their stock and found that more than 94 percent of sample firms split their stock into an “optimal trading range”. Consistent to the CFOs survey in the US, Boonrumluektanom (2012) also find that stock liquidity improves after stock split announcement in Thailand by the presence of small traders, higher trading volume, lower illiquidity measurement and less liquidity risk.

The choice of stock split is substantially interesting to be another signal of the future earnings. Bernnan and Capeland (1988) show that firms do not split by factor larger than in warranted by the stock price and private information and thus, the more positive information of the firm’s future earning, the larger split factor. Manager will not falsely split because it incurs expected transaction cost and finally harm the share price. Additionally, choice split factors as a signaling of future earnings is well accepted by practitioners and investment banking firms. From the proposal to Midlantic Banks Inc., Shearson Lehman Brothers Inc. (1983), there are at least three benefits from stock splits; bringing stock price to popular trading range (technical and psychological reasons), being viewed as optimism prospects of company future

earnings or cash dividends and large proportion of split factor results in strong assessment of the prospects of the firms.

Moreover, there is an obvious trend of Thai listed firms which pay stock dividend and stock split over the past ten years. Collected from SETSMART data base, the first stock dividend was distributed in 1999 by CPF and there was no more than 5 Thai listed firms which paid stock dividend during 1999 to 2003. However, the number of Thai listed firms that pay stock dividend has been rising. Greater than 10 times from the beginning of the first payment, the number of the stock dividend paying firms during 2012 to 2014 are interestingly increased 29, 54 and 38 respectively. Another interesting point of Thailand is about tax benefit form stock dividend comparing to develop market. With a unique tax regulation in Thailand, stock dividends have to pair with cash dividend in order to pay for 10 percent of withholding tax. Thereby, there is no tax incentive to pay stock dividend like in the developed market.

Even though stock splits and stock dividends yield nothing to firm value in term of accounting perspective, both convey the favorable information to investors and are a signal for a private information of the firm. As we know that there is abnormal return during the announcement, the split factor can be affected by information about the future earnings. Therefore, this thesis examines the role of split factor during the announcement of Thai listed firms and signaling of the firm future earnings.

Statement of Problem and Research Question

Role of stock splits and stock dividends have long puzzled because both yield the increment in the equity share outstanding but should not have effect on firm's value. Nevertheless, from the previous empirical studies, stock splits and stock dividends announcement can convey favorable information about future earnings to outside investors and provide the positive abnormal return during the announcement. In addition, split factor can also convey the favorable information about future earnings and investors' inference about firm value according to firms' split factor signals. In the Stock Exchange of Thailand, there are increasing number of

these transactions in each year which is interesting to test whether it is consistent with developed market or not. Hence, this thesis has 3 board research questions as following. What are the incentive for Thai listed firm to do split stock and distribute stock dividend? What are the determinants of split factor choice? and Can split factor act as a signal about future earnings?

Objectives of the study

This thesis aims to study the signaling hypothesis via the impact of split factor of stock dividends and stock splits on management's private information and analysts' earnings forecast error from January 1, 1998 to December 31, 2013. Due to signaling hypothesis of stock splits and stock dividends, for Thai listed firms and Thai market, this study attempts to examine four questions to understand economic reasons of both firms and public investors during the stock dividend and split announcement. First, how market participants react to stock split and stock dividend announcement? Second, what factors can influence the choice of split factor of Thai listed firms? Third, what is the relation between stock split and stock dividend abnormal return during the announcement period and choice of split factors? Forth,

is there a relation between revision of investor's viewpoint about firm's value after stock dividends and splits and firm's future earnings?

In summary, this thesis desire to test whether split factor can be a proxy of management's private information by using analysts' earnings forecast error.

Contribution

This study provides the empirical evidences on the relationship between split factor of stock dividends and stock splits of Thai listed firm and management's private information and analysts' earnings forecast error in Thai stock market. This thesis tries to find the factors which influence the split factor of management's decision. From the signaling hypothesis, abnormal return should be found around the stock dividend and split announcements. Moreover, the choice of split factor can be a signal of future earnings.

The results of this study yield benefits to many aspects. First, in academic aspect, there are inconclusive reasons to explain the stock split and stock dividend transaction i.e. signaling hypothesis or liquidity hypothesis. This thesis aim to understand stock split, stock dividend transactions and the factors that explain the

abnormal return during the split and stock dividend announcement. Furthermore, several of previous literatures studied by using US data and this study is the first studying in Thai Data to test the stock split and stock dividend transaction. Confirming the previous studies, the results of the study support the previous literature of liquidity improvement hypothesis in split announcement.

Second, for the aspect of retail or individual investors, investors can interpret split factor as a proxy of management's optimism of firm's prospects and thus set their strategy, have efficient investment implementations when firms employ different choice of split factor of stock dividends and stock splits.

Third, for firm management aspect, they can expect the effects of stock dividends and stock splits after the announcement at various split factor and make decision whether which choice of split factor is suitable to convey firms' favorable information and improve the liquidity after the announcement.

The rest of this study is organized as follows. Chapter II provides the literature review and hypothesis development. Chapter III explains data and methodology.

Chapter IV reports the result and discussion. Finally, chapter V concludes the results of the study and suggests for an area for future research.



CHAPTER 2

Literature Review and Hypothesis Development

In this section, it starts with the perfect market where dividend policy in both amount and form is irrelevant to the firm's value. However, when assumptions are not held, there is information asymmetry between firms or management and outside investors. Signaling is required to manipulate the firm's value. Not only the signaling hypothesis which I goal to study the incentives of firms to split stocks and pay stock dividends, but there is another hypothesis which explain the incentive of the firm to split stock and pay stock dividend namely, optimum trading range or liquidity hypothesis.

Irrelevance Dividend Theory

Miller and Modigliani (1961) document that choice of dividend policy does not affect firm's value. This assumption, consisting of with perfect capital markets, rational investors, on asymmetric information, and no taxes implies that dividend policy is irrelevant to shareholders because investor can make homemade dividend by costlessly selling fraction of holding shares equivalent to desired dividends.

Because the return of investor is composed of both dividend and capital gains, larger current dividends imply counterweighing lower future capital gains. In this case, investors is indifferent between capital gain and dividend since they can be interchangeable and depend on the investor's consumption preference. Dividend policy is irrelevant and is not determinants of the firm market value.

Signaling Hypothesis

Stock split and stock dividend as a signal

It is widely known from practitioners that stock dividend and stock split are planned to keep the stock price of firm to some optimal range. By setting set the share price within customary trading range and increasing liquidity of stock, they make small investors easier to purchase the round lots and increase the number of shareholders. Moreover, stock splits stock dividends call attention about firm future growth from analyst to the firm. Underpriced firms find such reassessments on and after the announcement date.

Fama,Fisher,Jensen and Roll (1969,FFJS) examine the signaling hypothesis during the stock split announcement. FFJS discuss two related question: Is there normally some

“unusual” behavior in the rates of return on a split security in the month surrounding the split? And if splits are associated with “unusual” behavior of return, to what extent can this be accounted for by relationships between splits and changes in other more fundamental variables?

FFJS introduce signaling hypothesis and trading range hypothesis. They suggest that there is high returns in advance of the stock splits because, during the pre-split period, these firms have high increase in expected substantial earnings and dividends and the market anticipate this favorable information. The market knows and uses the split announcement to re-estimate the expected earnings in the future. FFSJ also indicate that the implications of the market after split announcement, on average, fully price into a share at least by the end of split month but most are immediately after announcement date. They also support the market efficiency that stock prices adjust suddenly to new information.

Lakonishok and Lev (1987) study the incentive of firm to announce split and stock dividend and find stock splits are used to return the stock price to the normal

range after unusual growth period. They do not support that stock splits improve the marketability measured by permanently trading volume but splitting might have impact on composition of shareholders. Besides, stock splits support the signaling motive because they exhibit splitting firms have a slightly higher growth earnings particularly in dividends than control firms. However, the characteristics of stock dividend firms are markedly different. Stock dividends are not distributed for adjusting stock price to the normal level for the relatively low price firm and for small increasing in number of shares from stock dividend. The stock dividends may lie in the relatively low cash dividend or for temporally substituting for cash dividends.



Ikenberry, Rankine and Stice (1996) study about the signaling hypothesis and trading range hypothesis of stock splits and the results are consistent with previous studies that stock split announcement convey the favorable information. In addition, they find that market reaction is larger for small firms, low book-to-market firms and low share price before splitting. Managers set their splitting decision on their

expectations of the firm's future earnings. For example, a firm with two-for-one splits subsequently has favorable performance in long-run after the announcement.

However, Grinblatt, Masulis and Titman (1984, GMT) assume that there is cost related with stock dividend and stock split. If managers have negative information about future growth, they may not increase the number of shares by splits or stock dividend, even though they perceive the share price to be too high. The share price eventually returns to normal range anyway when the bad news is reviewed. Thereby, an announcement of stock dividend may convey only favorable information to the market. GMT exhibit that there is significantly positive announcement return for all the sample. Moreover, ex-announcement return of stock dividends are larger than stock splits. For subsamples of pure splitting with on other announcement during three days around the announcement and no cash dividend during previous three years, the valuation change of pure splitting and stock dividend cannot be explained by the near future increase in cash dividends. Therefore, stock split and stock dividend do not convey any imminent favorable information.

Split factors and signaling

According to Merton (1987), Brennan and Hughes (1991) assume that investors will buy only the stock which they “know about” and this knowledge of firms is provided by security houses which forecast about firm’s future earnings. This allows managers to influence the number of broker coverage because investors will invest only in stocks which brokers forecast earnings. They support the signaling hypothesis that firms will split stock to convey private information which yield the positive abnormal return. Managers with private good information have incentives to attract the security house to forecast their earnings. Moreover, they find that the number of analyst coverage is negatively related to the share price and positively related to the magnitude of stock splits (split factor).

McNichols and Dravid (1990) provide the empirical result that firms signal their private favorable information about future earnings by their choice of split factor. First, they document the size of split factor and find that it has positive relationship with pre-split share price and negative relationship with pre-split market value of

equity. This is consistent with the hypothesis that larger firms prefer a higher trading range. Second, holding other factors constant, price movement during the stock dividends and stock splits are significantly correlated with split factor. Third, they show that split factor is correlated to the forecast error representing favorable information. Therefore, Choice of split factor can be viewed by investors as signal of private favorable information about future earnings.

Long-run returns after stock split

From various supportive studies about the post-split return, many literatures find the higher post-split return of splitting firm relative to non-splitting firms, for example, Ikenberry, Rankine and Stice (1996) indicate the positive relationship of splits and the return after the announcement among the 1,275 samples collected from NYSE during 1975 to 1990. Besides, Desai and Jain (1997) analyze the long-term return after split announcement by assembling 5,596 data during 1976 to 1991. They exhibit the excess return in the announcement month is around 7.1%, and for 1 year and 3 year buy-and-hold abnormal return in post-split period are 7% and 12%,

respectively. The results are in line with the findings of Ikenberry and Ramnath (2002). Because of informational inefficiency, they propose that the market tends to underreact to the split announcements and show a 9% drift of abnormal return in the following year of the announcement.

However, some findings criticized in long-run return and splitting events. Byun and Rozeff (2003) measure the post-split (25 percent or larger split of factor) performance of 12,747 stocks from 1927 to 1996. Comparing to the long-term abnormal returns produced by the buy-and-hold strategy and cumulative return methods reveals that they are not very different, they find that both sellers and buyers of splitting stock do not, on average, receive abnormal returns by employing different investment methods, period and sampling. In the long period, investor have not underreacted or overreact to stock splits. They support that stock market is efficient to stock split. After the actual day of splitting, Boehme and Danielsen (2007) collect 6,106 splitting events during 1950 to 2000, exhibit that the abnormal return

during the split announcement do not continue for long period and do not find the long-run positive abnormal return after the announcement.

Employing new criteria for the splitting event, Hwang, Keswani and Shackleton (2008) separate splits event into two groups i.e. anticipated and surprised splitting events. Anticipated firms have stronger operating performance before the split announcement; therefore, their splitting decisions can convey and be viewed credibly to the public. Market reacts positively to these splitting firms during the splitting announcement but not much drift in abnormal return perceived in the long-run. On the contrary to the anticipated splitting firms, surprised splitting firms face underreaction of the market during the announcement because of low creditability, but observed a positive drift in the long-term return.

Long-run operating performance after split announcement

Measuring the percentage change in earnings and cash dividends five years before and after the SD announcement, Lakonishok and Lev (1987) collect sample during 1963 to 1982 with sample of 1,015 splitting events and find that splitting firms

have a higher earnings performance during the five-year prior the split announcement, compared to matching firms with no split announcement. Even though earnings growth in 5 post-split years of splitting firm does not contrast much relative to matching firms, the growth is persistently above the matching groups in the 5 year after the split announcement. Moreover, growth rate in cash dividend of the splitting firms is also higher than the control groups. These indicate that both earnings and cash dividends are improved after the splits and split event could be as a signal for the improvement in firm performance.

Nevertheless, there are contrary literatures to signaling hypothesis as well and they do not find the supportive evidences or even indicate the adverse effects of split announcement to the future performance of the splitting firms such as earnings and cash dividends. Observing in earnings change, Asquith et al. (1989) find the significant improvement in earnings four years before the splitting announcement and the major increase in earnings happens in the announcement year. They do not find any statistically significant increase in earning after the announcement. The

results show that splits do not convey or signal the future performance and they seem to convey about the good past performance. Studying about the signaling of split information for the improvement in the future cash dividend between splitting and non-splitting firms, Nayak and Prabhala (2001) collect samples during 1985 to 1994, leading to a 1,597 splitting events and document that positive abnormal return during the split announcement do not convey about the dividend information in the future. Along with the results in stock splits and information of future profitability improvement by Huang, Liano and Pan (2006), they gather samples during 1963 to 1998 with 6,417 splits find slight evidences that display the relationship between split announcement and the future profitability improvement of splitting firms. Even worse, they observe the adverse relationship of stock split on the profitability in following year, excluding firms with a split ratio less than 0.5.

In summary, stock splits as a signal for the firm future performance improvement topic is quite controversial among the reviewed literatures. There are both supportive and contrary evidences in the splitting event.

Optimal price/liquidity improvement hypothesis

Optimal price and stock price variation

Interestingly, Angel (1997) collects 2,517 samples from various stock market and NYSE during 1924 to 1994 and find that the median price of New York, London and Hong Kong stock price is \$40, £5 (\$7.5) and HK\$22 (\$2) over 50 years. It seems that an optimal trading range of stock price exists. Corresponding to the previous study, Dyl and Elliot (2006) document that firms target their own specific price range and manager could employ splits to increase firm value. Comparing stock price among 2 groups i.e. splitting and non-splitting firms 5 years before and after the split announcement, Lakonishok and Lev (1987) analyze monthly stock price and discover that, in the year 5 before the splitting, the average price of both groups are quite close. Subsequently in 4 years later before the split announcement, the stock price of splitting firms highly diverts to non-splitting group as the announcement date approaches. After the split announcement, the gap of two groups tapers and finally disappear in the fourth month after the announcement. In the succeeding 5 years after the announcement, the average price of both group is almost alike. By the

splitting event, high-level price of a firm is adjusted to the desirable trading range.

Practically, the survey from Indian managers by Methhta, Yadav and Jain (2011) also supportively indicate the second incentive to split their shares is the optimal trading range.

Liquidity improvement after split announcement

Gathering the 3,721 splits during 1975 to 2004, Lin, Singh and Yu (2009) demonstrate that splitting can improve trading liquidity by reducing trading cost and cost of capital of the firms. Moreover, the presence of no trading day is diminished and the improvement in liquidity has a positive relationship with the announcement return, meaning that the abnormal return during the split announcement could be partially explained by the liquidity improvement in splitting firms. In the trading agent aspect, Dhar et la. (2003) find that there is more of individual investors and less of institutional investors buy a splitting stock. Practically, the survey from Indian managers by Methhta, Yadav and Jain (2011) also supportively indicate the first incentive to split their shares is to improve stock liquidity.

Nonetheless, there are literatures against the liquidity improvement hypothesis. Several studies such as Lamoureux and Poon (1987), Murray (1985), Copeland (1979) and Lin, Singh and Yu (2009) show that post-splitting liquidity does not improve and diminish due to wider bid-ask spread, smaller market depth and falling in trading volume.

In conclusion, whether stock splits can improve liquidity is quite debatable and unclear among the reviewed literatures. There are both supportive and contrary evidences in the splitting event.

Stock split and stock dividend in Thailand

Boonrumluektanom (2012) analyze three impacts of the stock splits in Thailand; signaling hypothesis, liquidity improvement and information asymmetry. First, he shows the supportive signaling hypothesis by testing abnormal return and trading volume. This paper finds abnormal volume of 79 percent from all observations and average abnormal return of 1.06 percent at the announcement date. Second, he exhibits that liquidity is improved after splitting because of presence of small trader, higher number of trading volume and lower illiquidity

measurement. They support the trading range hypothesis. Third, information asymmetry is diminished after splits because there is slight reduction in probability of informed trading and adjusted probability of informed trading. Therefore, for Thai stock market, the results which test signaling and trading range hypothesis are consistent with international studies.

In conclusion, roles of stock split and stock dividends are to bring stock price into optimal trading range and to enhance liquidity of a firm's shares. Because of the presence of abnormal return during the announcement, previous empirical studies support signaling hypothesis of stock splits and stock dividend and show that these transactions convey favorable information of future earning of the company. In addition, split factor can be a signal and proxy of management's viewpoint of the firm's future performance. In Thailand, the study also find the consistent results with the developed market in both signaling and trading range hypothesis.

Hypothesis Development

Theoretically, stock dividends and stock splits have no relation to the firm's value. However, there are many studies that support trading range hypothesis when

firm splits and distributes stock dividend. Stock splits and stock dividends make investors, especially small investors, easier to buy round lots and improve liquidity of trading volume. Due to the asymmetric information between management and outside investors, signaling hypothesis are tested whether stock dividends and stock splits can convey the information about a firm's future profitability to outside investors. Additionally, role of choice of split factor is also interesting to study about the hidden information of management's optimism during the announcement. In this thesis, there are two central questions about stock dividends and stock splits: First, can Thai listed firm's announcement about stock dividends and stock splits signal favorable about future earnings? Second, can split factor act as a signal about future earnings?

Our signaling test assumes that there are costs related to the stock splits and stock dividends. Conroy, Harris and Benet (1990) examine the effects of stock splits on bid-ask spreads and find that percentage spread increase after splitting which incur liquidity cost to investors. This evidence thus suggests a liquidity cost of stock

splits that must be outweighed the benefits of splits. These imply that manager must carefully think before stock dividend distributing and splitting announcement and the choice of split factors. In Stock Exchange of Thailand (SET), there is implicitly related cost of split and stock dividend namely the percentage of tick size relative to the share price. For example, Stock A has an initial price at 25 baht which has bid-ask spread of 0.1 baht or 0.04% of the share price. After the 10-to-1 stock dividend announcement, the share price drop proportionally to 2.5 baht and has bid-ask spread of 0.02 baht or 0.08% of the share price. Therefore; the cost of stock dividend and split is associated with the tick size of the stock price

Whereas, in developed market, the trend of stock dividend distribution keeps decreasing over time, the number of listed firms in Thailand which distribute stock dividends is increasing over the past ten year. Moreover, the number of Thai listed firms which split stock also rise over the past ten years. It makes Thai listed firm interesting to test the signaling hypothesis of both stock dividends and stock splits whether stock dividends and stock splits convey private information and split factor

can be a proxy of management's optimism about firm's future earnings. To analyze the relation between choice of split factor and private information about firm's future earnings, I measure management's private information about future earnings by the forecast error reported by analysts.

In this thesis, I have two main questions consisting of seven hypotheses about stock splits and stock dividends announcement. First, I examine the management's split factor choice which depends on two factors according to the trading range hypothesis: pre-split price and the market value of the firm's equity. I examine the relation of analyst's earning forecast error and the variation in split factors. Second, I test the positive correlation between announcement date return prediction errors and an estimate split factor. Lastly, if both stock splits and stock dividends convey the favorable information about firm's future performance, investors should revise their viewpoint when the firm announces these transactions and thus it would lead to firm's earning forecast error. I test the relation between choice of split factor and earning forecast errors to understand whether managers can include their private

information about prospects of the firms in the split factor choice. The expected results are seven hypotheses listed as following:

Determinants of split factor choice

By setting set the share price within customary trading range, splitting makes small investors easier to purchase the round lots and increase the number of shareholders. The higher the price of stock is driven, the higher split ratio to bring the stock price back to the desired trading range of the management. Interestingly, Angel (1997) collects 2,517 samples from various stock market and NYSE during 1924 to 1994 and find that the median price of New York, London and Hong Kong stock price is \$40, £5 (\$7.5) and HK\$22 (\$2) over 50 years. It seems that an optimal trading range of stock price exists.

Consisting with Stoll and Whaley (1983), they find a strong positive relationship between firm price and share price which document that large firms prefer to maintain high share price.

Illiquid stocks also have high chance of splitting or high split ratio to small price to be attractive to the small investors and finally improve the liquidity after the split and stock dividend announcement. Following by Lin, Singh and Yu (2009), they demonstrate that splitting can improve trading liquidity by reducing trading cost and cost of capital of the firms. Moreover, the presence of no trading day is diminished and the improvement in liquidity has a positive relationship with the announcement return, meaning that the abnormal return during the split announcement could be partially explained by the liquidity improvement in splitting firms.

Therefore, this paper form the three hypotheses to test the pre-splitting price, liquidity and market capitalization as determinants of the split factor choice.

Hypothesis 1: Pre-split price is positively correlated to choice of split factor.

Hypothesis 2: Equity market value is negatively correlated to choice of split factor.

Hypothesis 3: Liquidity is negatively correlated to choice of split factor.

The split announcement is interesting signal for the merger and acquisition announcement. Obviously found from the news of the merger and acquisition in

both US and Thai Market, splits are made mostly 1 year before the announcement of merger and acquisition. For example, in US, Berkshire in 2010 splits its Class B stock 50-for-1 to buy the railroad Burlington Northern (BNSF). In Thailand, CPALL in 2012 pays stock dividends 1:1 before the announcement of MAKRO acquisition in 2013. It seems that, after the merger and acquisition announcement, the stock price would spike beyond the desired trading range. Thereby, management need to split the stock price first to ensure the stock after the merger and acquisition announcement would be in their desired trading range.

Intended to lower the share price to be more attractive to the acquired firms' stockholders, especially when acquisitions deals are financed by the stock, Gou, Liu and Song (2008) suggest that acquiring firms are likely to split stock to restore share price to an optimal trading range before the acquisition announcements. Further, D'mello, Tawatnuntachai and Yaman (2003) show that firms split their share price before the SEO to make price marketable to the small investors and to widen the investor base. Therefore, this paper forms the hypothesis to test whether the firm

events such as merger and acquisition, seasonal equity offering and warrant issuance events have impact on the decision of the management on the split factor choice.

Hypothesis 4: Merger and acquisition, seasonal equity offering and warrant issuance events are positively related to the choice of split factor.

Signaling hypotheses

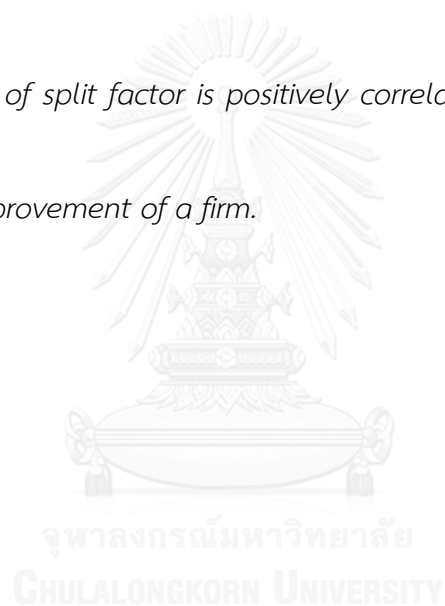
Mcnichols and Dravid (1990) provide the empirical result that firms signal their private favorable information about future earnings by their choice of split factor. First, they document the size of split factor and find that it has positive relationship with pre-split share price and negative relationship with pre-split market value of equity. This is consistent with the hypothesis that larger firms prefer a higher trading range. Second, holding other factors constant, price movement during the stock dividends and stock splits are significantly correlated with split factor. Third, they show that split factor is correlated to the forecast error representing favorable information. Therefore, Choice of split factor can be viewed by investors as signal of

private favorable information about future earnings. To test the signaling hypothesis, this paper set 3 hypothesizes.

Hypothesis 5: There is a positive market reaction during stock split and stock dividend announcement.

Hypothesis 6: Announcement return is positively correlated to split factor signaling.

Hypothesis 7: Choice of split factor is positively correlated to earning forecast error and performance improvement of a firm.



CHAPTER 3

Data

Data and Sample Selection

Split ratio

The ratio that use for adjusting number of shares outstanding and stock price after the firms have announced the split and stock dividend announcement given that market capitalization still the same. For example, before the split and stock dividend announcement, a firm has 100 million shares outstanding and each share cost \$5 per share. The total market capitalization of this firm is \$500 million. Then, the firm announce to split its share by the ratio of 2-for-1 meaning that each 1 old share would be 2 share after the announcement. The stock price will be diluted to half of the old price to make market capitalization yield the same. In short, after the announcement, the firm will have 200 shares outstanding and \$2.5 of stock price with the same amount of \$500 million market capitalization.

Stock Dividends

Stock dividend and announcement date are collected from the SETSMART database. Sample includes all Thai listed firms in both Stock Exchange of Thailand (SET) and Market for Alternative Investment (MAI) which have stock dividend from January 1, 1998 to December 31, 2015. The total number of stock dividend distribution during the studying periods is 312 transactions

To remain in the final sample, a stock dividend announcement must fulfil the following criteria: The sample firm must not be the delisted firm.

The stock dividend for preferred stock is excluded.

Required data is presented as following. Collected from DATASTREAM, data for Thai listed firms which pay stock dividend include daily close price to compute daily return, daily trading volume, and number of share outstanding, 1-month Treasury bill as risk-free rate, book value and market value during January 1, 1998 to December 31, 2015.

Stock splits

Stock splits and stock split announcements data are obtained from the SET Smart. Sample includes all SET-listed companies which have stock split from January 1, 1998 to December 31, 2013. The total number of stock split announcements is 487 events.

Stock and market return

The return of stock and market are collected from Bloomberg in daily basis and adjusted for stock splits and dividends. The daily return of stock and market during the stock split and stock dividend announcement is the holding period return with dividend reinvested and can be defined as follow:

$$R_{it} = \ln \left(\frac{P_{it}}{P_{it-1}} \right)$$

P_{it} is adjusted closing price for stock i at the end of day t , and P_{it-1} is adjusted closing price for stock i at the end of previous day t .

Market capitalization

Used in the model to analyze the correlation with choice of split factor and in the stock matching as a first criteria, market capitalization is collected from

Bloomberg in a daily basis and calculated from the total market value of the shares outstanding. Market capitalization is from multiplying number of company's outstanding shares by the current market price of share daily.

Stock price

Stock price is collected closing price from Bloomberg in a daily basis. Besides, the price has already been adjusted from stock dividend and stock split effects.

Return prediction error

This section provides the model for hypotheses testing. There are three model which are used to test the favorable information conveying during the stock split and stock dividend and the split factor as a signal. To conduct these hypothesis testing, I assume that outside investors know and utilize all available public information to form their expectation about firm's value. Management's split factor choice does not convey any predictable public information about firm's value. Correspondingly, split factor determinants which are predictable by public information cannot convey any signal of management's private information.

Both preannouncement returns (RUNUP_i) and announcement return prediction error (ANNRET_i) are from the market model:

$$R_{it} = \alpha_i + b_i R_{mt} + r_{it}$$

Where r_{it} is the continuously compounded return prediction error for security i from day $t-1$ to day t .

R_{it} is the continuously compounded return for security i from day $t-1$ to day t .

R_{mt} is the continuously compounded market return from day $t-1$ to day t .

RUNUP = the sum of continuously compounded return prediction errors from days -120 to -2 . These return prediction errors are based on market model parameters estimated using days -320 to -121 .

ANNRET _{i} = the sum of the continuously compounded return prediction errors for the three days surrounding the SD

announcement. Return prediction errors are based on a market model estimated for days -221 to -22.

Earnings forecast error

Earnings forecast error is computed from the difference between the first annual earnings announced after the stock split and stock dividend announcement less the average of analysts' pre-stock split and stock dividend announcement earnings forecast, divided by the average of analysts' pre-stock split and stock dividend announcement earnings forecast. The earnings and the forecast of 1-year ahead earnings by analysts are collected from Bloomberg database and SETSMART.

Forecast error can be defined as following formula;

Forecast error (FE)

$$= \frac{\text{1 year ahead earnings forecasted by analysts} - \text{annual earning after SD}}{\text{1 year ahead earnings forecasted by analysts}}$$

Liquidity measurement

In order to cover various aspects of liquidity measurement, there are 2 type of liquidity measurement in this study namely, day-based liquidity measurement and value-based measurement.

Value-based measurement

The value-based liquidity measurement is collected from the average daily trading turnover in unit of thousands of a stock in given period. The ratio of value-based turnover is shown below;

6 month share turnover

$$= \frac{\text{Total number of shares traded (unit in thousands Baht)}}{\text{Average number of share outstanding during that period}}$$

Day-based liquidity measurement

To measure the liquidity of stock, I use Lui's (2006) LMx, the standardized turnover-adjusted number of days with zero trading volume over the prior X months.

LM_x is described as following formula:

$$LMx = \left[\text{Number of zero daily volumes in prior } x \text{ months} + \frac{1/(\text{x month turnover})}{\text{Deflator}} \right] * \frac{21x}{\text{NoTD}}$$

Where x month turnover is stock's turnover in the prior x months calculated from the sum share trading in one day divided by total share outstanding in the given period (i.e. 1 month, 6 months, 12 months).

NoTD is the total number of trading days in the market over the prior x months

Deflator is the number which satisfy the following equation;

$$0 < \frac{1/\text{month turnover}}{\text{Deflator}} < 1$$

LMx_i is the indicator for illiquidity of a stock, for example, $LM12$ is the liquidity measurement for a stock over previous 12 months. High LMx_i means that stock is quite illiquid comparing to the low LMx_i for a given period of time x.

Liquidity Improvement

The liquidity improvement is measured by the percentage change of after-6-month average trading turnover to previous-6-month average trading turnover at the announcement period. The liquidity calculated in value-based is in the unit of thousands of Thai Baht.

Liquidity improvement

$$= \frac{\text{After 6 month average trading turnover} - \text{previous 6 month average trading turnover}}{\text{previous 6 month average trading turnover}}$$

Market-to-book ratio (P/BV)

Market-to-book ratio is employed in the stock matching as a second criteria.

The ratio compares current price of the stock to accounting book value of company.

The stock with larger the market-to-book ratio is more expensive than the stock with smaller the market-to-book ratio.

$$\text{Market to book ratio} = \frac{\text{Market capitalization}}{\text{Total book value}}$$

Event after stock split and stock dividend

The events which the study emphasis on after the announcement are the warrant issuance, merger and acquisition announcement and seasonal public offering

(RO). The Event after stock split and stock dividend announcement are collected from SETSMART database within 1 year later after the announcement. This variable is treated as a dummy variable which is 1 when there are the events and 0, otherwise.

Return on asset (ROA)

Return on asset is the ratio which exhibits how efficient company can utilize from its asset to generate net income. The ratio is calculated from the net income in that period divided by total asset of a company in that period. The ROA of companies is collected from DATASTREAM and SETSMART. The period of ROA collection is between 3 years before and after the company announcement of stock split or stock dividend.

$$\text{Return on asset (ROA)} = \frac{\text{Net income}}{\text{Total asset}}$$

Return on equity (ROE)

Return on equity is the ratio which exhibits how efficient company can utilize from its money that investors invest to generate net income. The ratio is calculated from the net income in that period divided by shareholder's equity of a company in

that period. The ROE of companies is collected from DATASTREAM and SETSMART.

The period of ROE collection is between 3 years before and after the company announcement of stock split or stock dividend.

$$\text{Return on asset (ROE)} = \frac{\text{Net income}}{\text{Total shareholders equity}}$$

Dividend per share

Dividend per share is calculated from amount of dividend company pays over one fiscal year to shareholder divided by total shares outstanding. The data is collected from SETSMART database.

$$\text{Dividend per share (DPS)} = \frac{\text{Dividend payment}}{\text{Total share outstanding}}$$

Book value per share

The Book value per share is calculated by the total shareholder equity adjusted by the part of preferred share, then divided by the total shares outstanding. The data is collected from SETSMART and DATASTREAM database.

$$\text{Book value per share (BVPS)} = \frac{\text{Total equity} - \text{preferred equity}}{\text{Total shares outstanding}}$$

Limitation of the study

There are some stocks which pay stock dividend or split the share but analysts do not cover these shares. There is no earning forecast error to measure the earning forecast error variable. This paper assumes random walk in the earnings of the companies' earning and use earning before and after the stock dividend and stock split announcement to compute forecast error instead. Besides, each event of stock split and stock dividend are assumed to be independent among each other.

Descriptive statistics

The summary of descriptive statistics such as mean, median, standard deviation, maximum, and minimum of all samples used in this paper is separated into 2 section i.e. split factors and variables used in the regression model.

Split factors

Table 1: Description of Split Factor Ratio

Split Factor Ratio (Old shares/share for 1 new share)	Number of splitting firms
>20 old shares: 1 new share	4

10 old shares: 1 new share	252
8.5 - 6 old shares: 1 new share	8
5 old shares: 1 new share	103
4 old shares: 1 new share	14
2.5-2 old shares: 1 new share	75
1 old share: 1 new share	23
<1 old shares: 1 new share	300
Total	799

Table 1: Descriptive statistics of split factor ratio and the number of transactions in each ratio. The data are collected from SETSMART database during 1998 to 2013. 312 transactions from stock dividends and 487 events of stock splits.

Variables used in the regression model

The basic descriptive statistics in variables used in the regression model is divided into 3 groups such as operating performance (ROA and ROE), return (RUNUP_i and ANNRET_i), liquidity measurement (LM12, trading turnover and liquidity improvement) and company characteristics (total asset, dividend payment, market value, share price, forecast error, market-to-book and book value per share) to easily understand each variable in a same given timeframe.

Operating performance

Table 2: Basic descriptive statistics of return on asset (ROA) and return on

equity (ROE) during 1997 to 2013 and the unit in percentage						
Time	Count	Min	Max	Mean	Median	SD
ROA _{t-3}	779	-14.955	48.462	12.472	15.351	8.668
ROA _{t-2}	779	-31.111	37.882	14.879	11.795	6.563
ROA _{t-1}	779	-19.675	37.457	12.965	9.444	3.804
ROA _t	779	-11.832	23.590	25.173	17.264	6.231
ROA _{t+1}	779	-2.588	50.225	3.997	2.560	7.563
ROA _{t+2}	779	-18.601	56.897	2.574	1.070	11.651
ROA _{t+3}	627	-28.993	45.843	16.581	12.267	8.235
ROE _{t-3}	779	-26.742	68.614	22.528	4.021	9.856
ROE _{t-2}	779	-11.906	74.167	27.539	13.343	6.689
ROE _{t-1}	779	-9.327	44.167	14.814	16.104	2.381
ROE _t	779	-18.819	23.410	22.189	10.683	8.978
ROE _{t+1}	779	-23.473	31.008	9.503	1.042	6.347
ROE _{t+2}	779	-26.926	23.896	17.995	7.174	3.543
ROE _{t+3}	779	-15.854	13.736	10.260	3.471	6.427

Table 2: Basic descriptive statistics of firm performance such as return on asset (ROA) and return on equity (ROE) given that time t is the announcement period of stock split and stock dividend. The performance data are collected 3 years before and after the announcement to analyze the long-term performance improvement of company that split its share. The data are collected from SETSMART database during 1997 to 2013.

Return during the announcement period

Table 3: Basic descriptive statistics of return during the announcement period

	Count	Min	Max	Mean	Median	SD
RUNUP (%)	779	-2.509	3.394	0.072	0.035	0.499
ANNRET (%)	779	-0.648	0.856	0.023	0.005	0.109

Table3: Basic descriptive statistics of return during the announcement period given that time t is the announcement period of stock split and stock dividend. Both preannouncement returns (RUNUP) and announcement return prediction error (ANNRET) are from the market model as a return prediction error. RUNUP is the sum of continuously compounded return prediction errors from days -120 to -2. These return prediction errors are based on market model parameters estimated using days -320 to -121. ANNRET is the sum of the continuously compounded return prediction errors for the three days surrounding the SD announcement. Return prediction errors are based on a market model estimated for days -221 to -22.

Liquidity measurement

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Table 4: Basic descriptive statistics of liquidity measurement

	Count	Min	Max	Mean	Median	SD
LM12	779	0.000	234.684	28.754	1.020	53.483
Liquidity Improvement (%)	779	-1.000	1914.084	3.918	-0.056	69.415

Table 4: Basic descriptive statistics of liquidity measurement during the announcement period. LM12 is the liquidity measurement 12 months before the split announcement. Liquidity improvement is the percentage change of share turnover (unit in value) between previous 6 months and after 6 months from the announcement period.

Company characteristics

Table 5: Basic descriptive statistics of company characteristics

	Count	Min	Max	Mean	Median	SD
Closed Price	779	0.047	1,318.40	49.429	14.850	114.907
ln(Market Cap./2000)	779	10.583	19.092	14.058	13.897	1.427
ln(Total asset/2000)	779	3.619	13.464	7.273	7.060	1.286
DPS _{t-1}	779	0.000	5.710	0.230	0.050	0.548
MTB _{t-1}	779	-2.680	8.210	1.251	0.930	1.142
BV _{t-1}	779	-8.603	6.020	5.121	1.987	1.041

Table 5: Basic descriptive statistics of company characteristics the announcement period. Closed price is average 10 days prior the announcement closed price. ln (market cap./2000) is natural logarithm of market value of firm's equity, measured 10 days prior to the announcement, divided by 2000 for reducing the absolute value nearby other variables. ln (total asset/2000) is natural logarithm of company asset, measured in the fiscal year of the announcement, divided by 2000 for reducing the absolute value nearby other variables. Dividend per share, market-to-book and book value are collected from SETSAMRT, 1 year before the announcement and used to calculate the expected operating performance of a company.

Matching firms

To avoid the selection bias sampling, this paper sets a group of controlling samples chosen by matching stock split and stock dividend samples with firms which do not split stock and do not pay stock dividend over the studying periods with firm's characteristics such as price-to-book ratio, market capitalization (firm size) and sector, respectively. The total controlling samples are 779 observations. The procedures of matching firm selection are following: (1) splitting firms are in the same sector, classified by SET criteria¹, with matching firms. If the matching firm is not available in splitting firm sector, the industry criteria would be applied. (2) market capitalization of matching firms is within $\pm 20\%$ of splitting firms in the splitting period. (3) price-to-book ratio of matching firms is within $\pm 20\%$ of splitting firms in the splitting period.

¹ There are 8 industries (28 sectors) in Stock Exchange of Thailand; Agri & Food Industry (Agribusiness and Food & Beverage), Consumer Products (Fashion, Home & Office Products and Personal Products & Pharmaceuticals), Financials (Banking, Finance & Securities and Insurance), Industrials (Automotive, Industrial Materials & Machinery, Paper & Printing Materials, Petrochemicals & Chemicals, Packaging and Steel), Property & Construction (Construction Materials, Construction Services, Property Fund & REITs and Property Development), Resources (Energy & Utilities and Mining), Services (Commerce, Health Care Services, Media & Publishing, Professional Services, Tourism & Leisure and Transportation & Logistics) and Technology (Electronic Components and Information & Communication Technology)



CHAPTER 4

Methodology

Operating performance around stock split and stock dividend

From signaling hypothesis, if stock split and stock dividend announcement convey positive information about the future operating performance of a company, then operating performance such as ROA and ROE should improve after the announcement. In this paper, ROA and ROE of SD firms are collected for years -3 through +3, where year 0 is the SD announcement year.

In the comparison, this paper compute the mean and median of SD firms to observe the change in operating performance. For analysis of operating performance improvement, the change of operating performance (ROA and ROE) is computed year by year from year -3 to year +3 and from year -3 to year 0 and year 0 to year 3. The group of samples are divided into 2 group i.e. group of SD firms and group of SD firms with matching firms.

A Model of split factor choice

Before this paper analyze the hypothesis whether split factor choice reflect private information about future earnings, this paper controls some variables to diminish the potential for omitted variables. According to Stoll and Whaley (1983), they find a strong positive relationship between firm price and share price which document that large firms prefer to maintain high share price. To control for the equity market value and pre-split share price, I include both into the model of split factor choice. From the signaling hypothesis, management employs stock split and stock dividend to convey positive private information of the company to the public e.g. the profitability or operating performance improvement. To get the signaling variable, this paper modifies the factors that might affect the choice of split ratio.

This thesis modifies the following tobit model of split factor choice from McNichols and Dravid (1990):

$$SPFAC_i = \begin{cases} \alpha_1 + \alpha_2 PRICE_i + \alpha_3 \ln MVE_i + \alpha_4 LM12_i + spfc, & \text{if RHS} > 0; \\ 0 & \text{otherwise,} \end{cases} \quad (1)$$

$SPFAC_i =$

$$\begin{cases} \beta_1 + \beta_2 PRICE_i + \beta_3 \ln MVE_i + \beta_4 LM12_i + \beta_5 RUNUP_i + \beta_6 FE_i \\ + \beta_7 Event_i + \beta_8 \Delta OP_0 + \beta_9 \Delta OP_{0 \text{ to } +3} + uspfc, & \text{if RHS} > 0; \\ 0 & \text{otherwise,} \end{cases} \quad (2)$$

Where $SPFAC_i$ = Split factor ratio for both stock splits and stock dividends.

$PRICE_i$ = Closing price 10 days prior the announcement.

$\ln MVE_i$ = Natural logarithm of Market value of firm's equity, measured 10 days prior to the announcement, in Baht millions.

$LM12_i$ = Liquidity measurement over 12 month.

$RUNUP_i$ = Cumulative residual returns measured from -120 days to -2 days.

FE_i = One-year-ahead percent forecast error.

$Event_t$ = Dummy variable which is 1 when there are M&A, SEOs and warrant transactions over 1 year after the announcement, 0 otherwise.

ΔOP_0 = is the change of operating performance (ROA and ROE) at year 0

$\Delta OP_{0\ to\ +3}$ = is the change of operating performance (ROA and ROE) from year 3 to year 0

spfc = unexpected split factor signaling.

uspfc = the portion of spfc that is not explain by earning forecast error after controlling for pre-announcement return.

The difference between 2 models is, in the first model, the information or the variables (closed price of stock, liquidity and market capitalization) are publicly known or can be noticed from the public sources for outsider i.e. investors in the market. Therefore, the residual term in the model (1), spfc, represent the unexpected signal of management private information to the public investors. However, in model (2), the variables used to run this model are from both public

and private information. In this model, I would run 3 times with different proxies of future performance i.e. forecast error (FE), change in operating performance at year 0 (short-term) and change in operating performance from year 4 to year 0 (long-term).

The residual term, $uspfc$, may not convey any signal of management private information about the future operating performance to the public investors.

In the first model, I expect to see positive coefficient of price (α_2), negative coefficient of market value of equity (α_3) and positive coefficient of LM12-liquidity measurement (α_4). As an error term from the regression result, $spfc$ is assumed to be normally distributed with zero mean and independent of price and market value of equity. After I control for both pre-split price and market value of equity, $spfc$ is used to analyze the relation between announcement period return and split factors.

In the second model, after controlling for price and market value of equity, this model examines whether the forecast error as proxy of private information about future earning can clarify the remaining of the determinants in split factor. Moreover, this model control for the component of earning forecast error that was realized

before the split and stock dividend announcement date, measuring by $RUNUP_i$. As an error term from the regression result, $uspfc$ is assumed to be normally distributed with zero mean and independent of price, market value of equity, forecast error, and cumulative residual returns. I expect to see positive coefficient of price (β_2), negative coefficient of market value of equity (β_3), positive coefficient of LM12-liquidity measurement (β_4), positive coefficient of $RUNUP_i$ (β_5), positive coefficient of forecast error (β_6) and positive coefficient of Merger and acquisition, seasonal equity offering and warrant issuance events (β_7).

Split factor signaling and forecasting profitability

From Fama and French (2000), the profitability is mean reverting in a competitive economy (in the industry and across industries) and the return on investment tends to move to the same level in all industries. They suggest the model to predict earnings and profitability of a company, called nonlinear partial-adjustment model. If the signaling hypothesis holds meaning that SD announcement reveals private favorable information of management of a company, the signaling

variable, $spfc_i$, should relate to the change in operating performance of a company after the SD announcement. The regression model is shown below:

$$\Delta OP_t = \alpha_0 + \alpha_1 spfc_i + (b_1 + b_2 NDOPD_0 + b_3 NDOPD_0 * DOP_0 + b_4 PDOPD_0 * DOP_0) * DOP_0 + (c_1 + c_2 N\Delta OPD_0 + c_3 N\Delta OPD_0 * \Delta OP_0 + c_4 P\Delta OPD_0 * \Delta OP_0) * \Delta OP_0 + e_t, \text{ for } t = 1, 2 \text{ and } 3$$

(3)

Where ΔOP_t is the change of operating performance (ROA and ROE) at year t .
 $spfc_i$ is the unexpected split factor signaling and used as a proxy for information from SD announcement.
 DOP_0 is the difference between operating performance in year 0 and the expected value of operating performance in year 0.

The expected value of operating performance in year 0 is the predicted value from the cross-sectional regression of ROA and ROE in year 0 on the natural log of total assets in 2000 dollars at year -1 , the ratio of dividends to the book value of equity in year -1 , DIV_{t-1} , dummy variable that is 1.0 when dividends are zero in

year -1 and zero otherwise, the market-to-book ratio in year -1, and ROA and ROE in

year -1. The model to find the expected performance is following,

$$\begin{aligned} \text{Operating performance}_0 = & \beta_0 + \beta_1 \ln\left(\frac{\text{total asset}_{t-1}}{2000}\right) + \\ & \beta_2 \left(\frac{\text{DPS}_{t-1}}{\text{BVPS}_{t-1}}\right) + \beta_3 \text{DIV}_{t-1} + \beta_4 \text{MTB}_{t-1} + \\ & \beta_5 \text{operating performance}_{t-1} + e_t \end{aligned}$$

(4)

After getting the coefficient of each variable, we predict the expected operating performance in year 0 as a fitted value from the regression.

NDOPD_0 is a dummy variable which is 1 when $\text{DOP}_0 < 0$; 0 otherwise.

PDOPD_0 is a dummy variable which is 1 when $\text{DOP}_0 > 0$; 0 otherwise.

ΔOP_0 is the change of operating performance (ROA and ROE) at year 0.

$\text{N}\Delta\text{OPD}_0$ is a dummy variable which is 1 when $\Delta\text{OP}_0 < 0$; 0 otherwise.

$\text{P}\Delta\text{OPD}_0$ is a dummy variable which is 1 when $\Delta\text{OP}_0 > 0$; 0 otherwise.

The coefficient b_1 measures the mean reversion in operating performance.

The coefficients b_2 , b_3 , and b_4 are to measure the nonlinear mean reversion in operating performance, meaning that the reversals are stronger for large changes of either sign. The coefficient c_1 measures the autocorrelation of changes in operating performance. The coefficients c_2 , c_3 , and c_4 measure the nonlinearity in the autocorrelation of changes in operating performance.

From the predicting profitability and earnings model, I expect to see positive coefficient of price (α_1) because it would show that the signal from SD announcement relates to the change in the operating performance in the future.

The relationship between announcement period returns and splitting signal.

In this testing, this model examines the association of market inferences of firm value and unexpected split factors. The model is below:

$$\text{ANNRET}_i = b_1 + b_2 \text{spfc} + e_2 \quad (5)$$

Announcement return (ANNRET) represent the reaction of investor during the stock split and stock dividend announcement date. Considered as a split factor signal, spfc is the residual term from the first model which control both pre-split

price and market value of equity. This model want to test for the revision of investors' viewpoint about firm value and split factor signal during the announcement period and I expect to see the significant and positive relationship of spfc coefficient (b_2).

The relationship among announcement period returns, change in operating performance and liquidity improvement.

In this test, this model examines the revision of investor beliefs on management's private information about the firm's future earnings. If split factor conveys private information about the firm's future earnings to the public, the revision of investor beliefs during the announcement date should agree with the earning forecast error. If the signaling hypothesis does exist, the excess return or the return prediction error during the SD announcement should be positively related to the change in operating performance. The model is as following:

$$ANNRET_i = C_1 + C_2LIM_i + C_3uspf_c + C_4FE_i + C_5\Delta OP_{i,0to1} + C_6\Delta OP_{i,0to3} + e_i$$

(6)

Where $ANNRET_i$ is the sum of the continuously compounded return prediction errors for the three days surrounding the SD announcement. Return prediction errors are based on a market model estimated for days -221 to -22.

LIM_i is the difference of liquidity on pre-split and post-split average trading volume 6 months before and after stock dividend and stock split announcement, representing liquidity improvement.

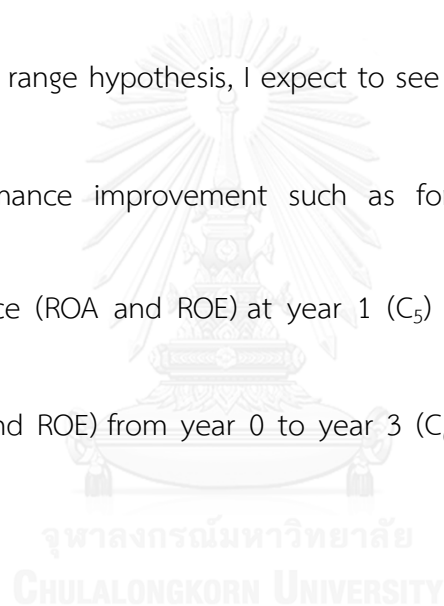
FE_i is One-year-ahead percent forecast error.

$uspfc$ is the portion of $spfc$ that is not explain by earning forecast error after controlling for pre-announcement return.

$\Delta OP_{i,0to1}$ is the change of operating performance (ROA and ROE) at year 0

$\Delta OP_{i,0\ to\ +3}$ is the change of operating performance (ROA and ROE) from year 0 to year 3.

From the second model, $uspfc$ is the component of the split factor signal which does not correlate to earning forecast error or performance improvement. The model illustrates a comparison between the announcement return prediction error around the split announcement date and earnings forecast error, performance improvement as well as other components of the split factor signal. Owing to signaling and optimal range hypothesis, I expect to see positive coefficient of proxies of operating performance improvement such as forecast error (C_4), change of operating performance (ROA and ROE) at year 1 (C_5) and the change of operating performance (ROA and ROE) from year 0 to year 3 (C_6) and liquidity improvement (C_2).



CHAPTER 5

Empirical Results

In this section, there are three parts: analysis of operating performance around the splitting announcement year, hypothesis testing of split factor choices and signaling hypothesis, lastly the analysis of results of the study. Before analyzing the results of the study, this paper sets the assumptions that investors form the expectation of firm's value by using all available public information; thereby, choice of split factor from management's viewpoint cannot be signaled the firm's value. In addition, the components of split factor predicted by the public information cannot be utilized as a signal of the private information of management's viewpoint because the public information is already known by all trading agents in the market.

Operating performance around split period

Operating performance of firms before and after the split announcement

From the signaling hypothesis indicating that split event convey a private and favorable information to the public, the operating performance or earnings should

improve after the split announcement. From table 6, the operating performance data of both splitting and matching firms are collected for years -3 through +3. The statistic of sample show that both mean and median of splitting group increase consistently over the past 3 year before the split announcement. The operating performance is peak at 1 year (year -1) before the split announcement. After the split announcement, the operating performance (both ROA and ROE) decline over 3 years following the split announcement.

Numerically, the mean (median) of ROA surge from 16.80% (7.24%) in year -3 to 40.36% (17.31%) in year -1 and peaks in this year. In announcement year, the ratio is 13.74% (9.42%) and subsequently drop in the following years, 5.75% (0.83%) in year 1, 16.01% (2.41%) in year 2 and 10.00% (0.05%) in year 3. ROE as another operating performance also has a same pattern as ROA sample, increasing before the announcement and then declining.

Table 6: Operating performance of splitting and matching firms during 1998 to 2015

Years relative to split date	ROA		ROE	
	Mean	Median	Mean	Median
Panel 1: Splitting Firms				
-3	16.80	7.24	26.62	7.97
-2	28.27	11.52	32.21	13.84
-1	40.36	17.31	52.00	26.16
0	13.74	9.42	20.38	11.28
+1	5.75	0.83	12.97	3.61
+2	16.01	2.41	14.76	7.67
+3	10.00	0.05	9.32	0.68
Panel 2: Matching Firms				
-3	26.91	3.32	-1.65	3.49
-2	28.78	7.50	0.88	4.26
-1	26.45	9.41	14.38	10.35
0	17.68	4.66	3.57	5.36
+1	13.20	0.46	-7.14	1.57
+2	10.90	1.33	4.10	7.67
+3	10.91	0.02	-5.86	0.89

Table 6: The operating performance of 754 splitting firms measured by ROA and ROE over the period 1998 to 2015. Mean and median are calculated from the samples and Winsorized the outlier observations at the first and 99th percentiles. The operating performance of 754 matching firms measured by ROA and ROE over the period 1998 to 2015. Mean and median are calculated from the matching samples. The matching criteria are industry, market capitalization and price-to-book value. Year 0 is the year of split announcement and the samples are collected 3 years before and after the announcement. All numbers are in the unit of percentage.

To compare the operating performance of splitting firms whether their performance is irregular or not, this paper matches splitting firms with matching firms by the following criteria; industry, market capitalization and price-to-book value. The operating performance of matching group is random with no obvious pattern for both ROA and ROE over years -3 to +3 as shown in Panel 2 of Table 6.

Table 7: The difference of operating performance between splitting and matching firms during 1998 to 2015

Years	Median: ROA	Median: ROE
-3	3.93*	3.49
-2	4.02	4.26
-1	7.89***	10.35***
0	4.76	5.36
1	0.37**	1.57
2	1.08	7.67*
3	0.003*	0.002*

Table 7: The difference of operating performance between splitting and matching firms measured by ROA and ROE over the period 1998 to 2015. The difference in mean and median are tested between 2 groups. Median difference is tested by Wilcoxon sign-rank test. For testing, ***, ** and * are denoted for the significant level at 1%, 5% and 10%, respectively. Year 0 is the year of split announcement and the samples are collected 3 years before and after the announcement. All numbers are in the unit of percentage.

To avoid the effect of the outlier data, from Table 7, this paper conducts median difference testing between splitting firms and the matching firms by Wilcoxon signed-rank for the median. The results of the test between two group indicate that the splitting firms have a significantly higher operating performance in 1 year before the announcement, comparing to the matching groups in the same period. Furthermore, the operating performance is significantly higher after the announcement year, comparing to the matching firms. The operating performance in the following year after the split announcement may abide by the signaling hypothesis because the long-term operating performance can complete the matching samples. From the analysis of the results, at this point, the split event seems to reflect both the pervious performance and the future operating performance. The signaling hypothesis seems to does exist with the splitting group.

Variation in operating performance

In another aspect of analysing the operating performance, Barber and Lyon (1996) suggest that the variation in operating performance is more suitable to be

used in test than the level of operating performance because the level of operating can omit the past performance of a firm compare to the control group. This paper therefore conduct this analysis to test the variation in the operating performance.

The results in Table 8 show that the mean (median) of variation in operating performance (ROA) in year before the announcement is -8.63% (5.46%). In the long-run period, the variation in operating performance is decreasing prior the split announcement and the variation improves after the announcement. Specifically, mean (median) of pre-split 3-year variation in operating performance (ROA) is -9.09% (-3.94%) and mean (median) of post-split 3-year variation in operating performance (ROA) improve to 10.34% (2.44%). Nevertheless, the results from variation criteria contradict with the results from the level of operating performance. For the matching group, the variation in operating performance (ROA) improves better during the pre-split period and go worse in the 3 following years of announcement. For the matching group, the mean (median) of variation in operating performance (ROA) in year before the announcement is -17.99% (-6.83%).

Table 8: Variation in operating performance of splitting and matching firms during 1998 to 2015

Years	ROA		ROE	
	Mean	Median	Mean	Median
Panel 1: Splitting Firms				
-3 to -2	1.84	0.74	3.01	0.00
-2 to -1	-2.30	1.43	6.20	2.64
-1 to 0	-8.63	-5.46	-20.51	-8.05
0 to +1	-4.42	-1.00	3.25	0.00
+1 to +2	-2.26	0.00	-9.30	0.00
+2 to +3	0.01	-1.57	4.46	-0.28
-3 to 0	-9.09	-3.94	-11.30	-3.59
0 to +3	10.43	2.44	-1.59	-2.09
Panel 2: Matching Firms				
-3 to -2	9.63	3.67	2.57	3.80
-2 to -1	14.39	2.14	13.59	6.97
-1 to 0	-17.99	-6.83	-11.11	-10.06
0 to +1	-3.57	-7.51	-10.66	-9.96
+1 to +2	12.52	3.62	11.09	4.40
+2 to +3	-6.02	0.16	-9.89	-2.87
-3 to 0	6.03	0.43	5.05	0.74
0 to +3	-14.17	-4.74	-9.46	0.11

Table 8: The variation in operating performance of 762 splitting firms measured by the change in ROA and ROE over the period 1998 to 2015. Mean and median are calculated from the samples and Winsorized the outlier observations at the first and 99th percentiles. The variation in operating performance of 762 matching firms measured by the change in both ROA and ROE over the period 1998 to 2015. Mean and median are calculated from the matching samples. The matching criteria are

industry, market capitalization and price-to-book value. Year 0 is the year of split announcement and the samples are collected 3 years before and after the announcement. All numbers are in the unit of percentage.

In the long-run period, the variation in operating performance (ROA) is increasing prior the event year and the variation decline after the announcement. Specifically, mean (median) of pre-split 3-year variation in operating performance (ROA) is 6.03% (0.43%) and mean (median) of post-split 3-year variation in operating performance (ROA) improve to 14.17% (4.74%).

From Table 9, after conducting the mean and median difference testing between splitting firms and the matching firms by employing t-statistic test for testing the difference in mean and Wilcoxon signed-rank for the median, the results of the test between two group indicate that the splitting firms have a significantly much lower variation in operating performance in 1 year before the announcement, comparing to the matching groups in the same period. The operating performance is significantly higher during year +1 to+2, comparing to the matching firms. However, the better improvement in variation in operating performance in the post-split period

are not consistent and statistically significant. The inconsistent of the variation operating performance in the following year after the split announcement may not abide by the signaling hypothesis because the long-term operating performance does not complete the matching samples.

Table 9: Variation in operating performance compared with matching firms during 1998 to 2015

Years	ROA		ROE	
	Mean	Median	Mean	Median
-3 to -2	9.63	3.67*	2.57	3.80
-2 to -1	14.39**	2.14*	13.59*	6.97
-1 to 0	-17.99***	-6.83*	-11.11*	-10.06
0 to +1	-3.57	-7.51***	-10.66*	-9.96***
+1 to +2	12.52*	3.62**	11.09	4.40***
+2 to +3	-6.02	0.16	-9.89*	-2.87
-3 to 0	6.03	0.43	5.05	0.74
0 to +3	-14.17*	-4.74***	-9.46*	0.11

Table 9: The difference of variation in operating performance between splitting and matching firms measured by change in ROA and ROE over the period 1998 to 2015. The difference in mean and median are tested between 2 groups. Mean difference is tested by t-test and the median difference is tested by Wilcoxon sign-rank test. For both testing, ***, ** and * are denoted for the significant level at 1%, 5% and 10%, respectively. Year 0 is the year of split announcement and the samples are collected 3 years before and after the announcement. All numbers are in the unit of percentage.

A Model of Split Factor Choice

A model of split factor choice with all available public information.

In this section, this paper employs the regression analysis to figure out the factors that determine the choice of split factors. The samples for regression model are from both splitting firms and matching firms. Before analyzing effect of management's viewpoint about future earning through choice of split factor, the regression analysis starts with the model that explain the choice of split factor by using all available public information such as market capitalization, share price and prior 12-month liquidity (LM12). According to trading range hypothesis, in the Model (2.1) of table 10, the coefficient of PRICE (β_2) is positive and significant at 95 percent. Besides the coefficient of lnMVE (β_3) is negative and significant at 95 percent, the

result of the study is consistent with Stoll and Whaley (1983). They find that firm with large size desire to maintain their high share price and the results show that Thai listed firms with large size tend to split share less than the firms with small size to keep share price high at desired level. However, the coefficient of liquidity measurement (β_4) is insignificant.

A Model of Split Factor Choice with All Available Public Information and Management's Viewpoint.

In the model (2.2), the study next examines the other factors that could explain the remaining split factor choice from the Model (2.1). This model includes variables that can represent the management's viewpoint about the private favorable information of the firm's future prospects such as future earnings (FE), the change of operating performance (ROA and ROE) at year 0, the change of operating performance (ROA and ROE) at year 1, long-term the change of operating performance (ROA and ROE) from year 0 to year 3 and some following specific events of the company such as warrant issuance, merger and acquisition announcement and

seasonal equity offering (SEOs) or right offering (RO). When stock return keeps moving up or even down before the earnings announcement, this may represent the correlation between forecast error and the preannouncement return. In short, price anticipate the earnings changes before the public announcement. This study uses the sum of continuously compounded return prediction errors ($RUNUP_i$) to control the component of forecast errors.

In model (2.2), the results for the coefficient of price and market capitalization are consistent with the Model (2.1). Following the trading range hypothesis, the coefficient of PRICE (β_2) is positive and significant at 95 percent and the coefficient of $\ln MVE$ (β_3) is negative and significant at 95 percent. Both are still important factors which can explain the split factor choice. Interestingly, the coefficient of forecast error (β_6) is positive and significant at 99 percent. It means that choice of stock split factor can signal or convey about the firm's future earnings. The coefficient of Event (β_7) is also positive and significant at 99 percent meaning that the subsequent events such as warrant issuance, merger and acquisition

announcement and seasonal equity offering (SEOs) have an explanatory power to the choice of split factor. The results are in line with Guo, Lin and Song (2008), indicating that the acquiring firms are more likely to split their share than the non-acquiring firms, particularly for large deals financed by stock. However, the coefficient of liquidity measurement (β_4) and the coefficient of $RUNUP_i$ (the sum of continuously compounded return prediction errors) (β_5) are insignificant.

For the model (2.3) to (2.6), this paper uses other explanatory variables for proxies of management's viewpoint about the private favorable information of the firm's prospects. In model (2.3) and (2.5), the analysis of the operating performance (in section 4.1.1) indicates that the performance in 1 year pre-split and post-split is significantly different from the matching firms and Lakonishok and Lev (1987) find that huge operating performance improvement comparing to control group could be found in large numbers only during the pre-split period. Therefore, the change of operating performance (ROA and ROE) at year 0 and the change of operating performance (ROA and ROE) at year 1 are added in to the model to be the

explanatory variables. The difference between model (2.3) and (2.5) is the operating performance used in the model; ROA is used in model (2.3) and ROE is used in model (2.5). To observe whether the long-term operating performance has the influence in choice of split factor or not, change of operating performance (ROA and ROE) from year 0 to year 3 is added in to the model (2.4) and (2.6). The difference between model (2.4) and (2.6) is the operating performance used in the model; ROA is used in model (2.4) and ROE is used in model (2.6).

In the model (2.3) and (2.5), the result of first 3 explanatory variables is consistent with the previous results. For both models, the coefficient of PRICE (β_2) is positive and significant at 90 percent and the coefficient of lnMVE (β_3) is negative and significant at 95 percent but the coefficient of liquidity measurement (β_4) and the coefficient of RUNUP_i (the sum of continuously compounded return prediction errors) (β_5) are insignificant. The interesting results of these models is the coefficient of the change of operating performance (ROA and ROE) at year 0 (β_8) and the change of operating performance (ROA and ROE) at year 1 (β_9). In model (2.3) which

operating performance is ROA, β_8 is positive and significant at 90 percent and β_9 is positive and significant at 95 percent, meaning that not only the future operating performance that influences the choice of split ratio but the operating performance in 1 year previous the split announcement also relates to splitting choice. This finding indicate that the management take both past and future performance into the decision of splitting choices. The results of Model (2.5), measuring the operating performance by ROE, show the results the same as the result of model (2.3).

In the model (2.4) and (2.6), the long-term operating performance variable is used to be a proxy of management's view of future firm prospects. Although the first 3 explanatory variables are significant and yield the same relationship with the previous model, the new adding explanatory variables is meaningless for both model (2.4) and (2.6) because β_{10} is insignificant. The results show that the management take only the operating performance in the short-term not long-term into the decision of choice of split factors.

Proxy for split factor signals

After running the estimation results of various models, this study want to find proxy of choice of stock split to be signal of management's private information about firm's prospect. From the model (2.1) given only the available public information, the error term or the residual of the choice of the split factor model in model (2.1), $spfc$, is used to be a proxy of component of the announced choice of split factor which is unanticipated at the split announcement. In the investors or the outsiders' view, they can infer the management's private information by noticing $spfc$. The residual term $- spfc$ is assumed to be normally distributed with mean of zero and independent with price, $\ln MVE_i$ and $LM12_i$.

The residual of the model (2.2) to (2.6) is the portion of $spfc$ which is unexplainable parts by the proxies of management's viewpoint of future firm performance improvement. $Uspfc_1$ is assumed to be normally distributed with mean of zero and independent with price, $\ln MVE_i$, $LM12_i$, $RUNUP_i$, FE_i and $Event_i$. $Uspfc_1$ is an unexplained variable of the choice of split factor model, after controlling pre-

split price, market capitalization, cumulative announcement return, earnings forecast error and specific subsequent events.

Due to the statistically significant results of the regression analysis in the both the change of operating performance (ROA and ROE) at year 0 and the change of operating performance (ROA and ROE) at year 1, this paper uses the residual from the model (2.3) and (2.5) to the further test as a portion of unexplained signaling by the models. Similarly, $uspfc_2$ and $uspfc_3$ is assumed to be normally distributed with mean of zero and independent with all independent variables in the models.

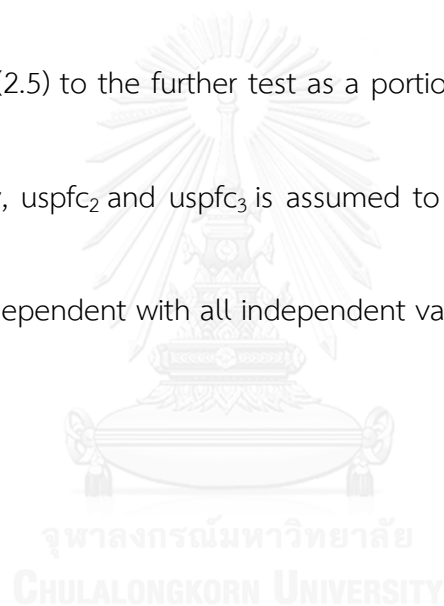


Table 10: Choice of split factor model estimation results

$$SPFAC_i = \begin{cases} \beta_1 + \beta_2 PRICE_i + \beta_3 \ln MVE_i + \beta_4 LM12_i + \beta_5 RUNUP_i + \beta_6 FE_i \\ + \beta_7 Event_i + \beta_8 \Delta OP_0 + \beta_9 \Delta OP_{0 \text{ to } 3} + uspf_c, & \text{if RHS} > 0; \\ 0 & \text{otherwise,} \end{cases}$$

Model	(2.1)	(2.2)	(2.3)	(2.4)	(2.5)	(2.6)
β_1	7.1810*** (3.58)	6.9178*** (3.45)	5.2444*** (3.38)	5.3796** * (3.47)	5.3370** * (3.45)	5.4748** * (3.53)
β_2	0.0028** (2.31)	0.0027** (2.17)	0.0023* (1.66)	0.2224* (1.84)	0.0023* (1.96)	0.0022** (2.27)
β_3	-0.2293** (-2.50)	-0.2211** (-2.14)	-0.2202** (-2.04)	-0.2246** (-2.08)	-0.2295** (-2.13)	-0.2316** (-2.14)
β_4	0.0025 (0.89)	0.0025 (0.75)	0.0015 (0.48)	0.0016 (0.52)	0.0018 (0.58)	0.00167 (0.54)
β_5	-	0.1941 (0.82)	0.0977 (0.33)	0.1281 (0.44)	0.1212 (0.14)	0.1399 (0.48)
β_6	-	0.3319*** (2.60)	-	-	-	-
β_7	-	3.2445*** (2.63)	3.1169** (2.25)	2.9874** (2.16)	3.0315** * (2.91)	3.0151** (2.18)
β_8	-	-	0.3127* (1.80)	-	0.3053** (2.19)	-
β_9	-	-	0.0771**	-	0.3443**	-

	(2.10)			*		
				(2.27)		
β_{10}	-	-	-	-0.0224	-	-0.1605
				(-0.12)		(-0.93)
Error Term	Spfc	Uspfc ₁	Uspfc ₂	Uspfc ₃	Uspfc ₄	Uspfc ₅
Number of observation	1,502	1,502	1,502	1,502	1,502	1,502
Adjusted R ²	5.84%	6.13%	6.27%	6.73%	6.25%	6.59%

Table 10 shows the estimation result from choice of split factor model. Model (1) represent split factor choice by all public available information. Model (2) to (6) represents split factor choice by both public information and management's viewpoint in 5 different proxies of future earning. The sample size composes of 1,508 observations consisting of 754 SD events and 754 matching firms during January 1988 to December 2015. The matching criteria are industry, price-to-book value and market capitalization, respectively. For the testing, ***, ** and * are denoted for the significant level at 1%, 5% and 10%, respectively.

Forecasting profitability and signaling hypothesis after the split announcement

In the competitive economy, mean reversion in investment return is hypothesized. Firms would not be longer in the relatively unprofitable industries and shift their production to relatively profitable because there is free movement in the competitive market. Therefore; the profitability of the investment would revert within and across industries and no firm would enjoy excess return during the long-run since other competitive firms can duplicate both innovative products and technology

in production which generate the excess return of a firm. Eventually, unprofitable firms move their production to the excess profitable industries until there is no excess return exists.

Table 11: Regression results of profitability and earnings forecasting model with signaling from the split announcement

$$\Delta OP_t = \alpha_0 + \alpha_1 Spfc_t + (b_1 + b_2 NDOPD_0 + b_3 NDOPD_0 * DOP_0 + b_4 PDOPD_0 * DOP_0) * DOP_0 + (c_1 + c_2 N\Delta OPD_0 + c_3 N\Delta OPD_0 * \Delta OP_0 + c_4 P\Delta OPD_0 * \Delta OP_0) * \Delta OP_0 + e_t, \text{ for } t = 1, 2 \text{ and } 3$$

ΔOP_t	α_0	α_1	b_1	b_2	b_3	b_4	c_1	c_2	c_3	c_4	R^2
yea	Operating performance (OP) = return on asset (ROA)										
r											
t=1	109.88	-	-	0.02	-0.002	-	-	0.08	0.00	0.00	0.00
	3	39.96	0.19	1	(-0.26)	0.00	0.17	2	0	1	4
	(1.30)	7	6	(0.24		1	7	(0.14	(-	(0.75	
		(-	(-	)		(-	(-	)	0.89))	
		1.18)	0.35)			0.66)	0.31)				
t=2	-	84.60	0.21	0.04	0.021*	0.00	-	0.19	0.00	0.00	0.00
	208.94	3	1	9	*	0	0.00	0	0	0	6
	1	(1.57)	(0.23	(0.35	(1.82)	(-	6	(0.20	(1.08	(-	
	(-1.55)		)	)		0.03)	(-	)	)	0.04)	

0.01)											
t=3	124.57	-	-	-	-0.019	0.00	-	-	0.00	0.00	0.00
	9	48.37	0.03	0.06	(-0.52)	0	0.01	0.04	0	0	7
	(1.07)	0	9	2		(-	8	5	(-	(-	
		(-	(-	(-		1.96)	(-	(-	0.05)	0.44)	
		0.30)	1.03)	0.05)			0.10)	0.02)			
yea	Operating performance (OP) = return on equity (ROE)										
r											
t=1	34.774	-	0.05	0.26	0.002	0.00	-	0.06	0.00	0.00	0.00
	(0.87)	18.69	8	6	(0.51)	0	0.08	4	0	0	2
		3	(0.23	(0.44		(-	0	(0.24	(-	(0.23	
		(-	)	)		0.22)	(-	)	0.66))	
		1.20)					0.32)				
t=2	-	13.37	-	-	-0.005	0.00	0.00	0.00	0.00	0.00	0.00
	37.732	1	0.01	0.66	(-1.33)	0	7	5	0	0	3
	(-1.16)	(1.05)	0	7		(0.04	(0.03	(0.02	(0.60	(-	
			(1.05	(-	)	)	)	)	)	0.03)	
			)	1.36)							
t=3	-	-	-	1.46	0.003	0.00	1.54	-	0.00	-	0.00
	26.583	20.12	1.51	2	(0.15)	1	9	1.65	0	0.00	2
	(-0.15)	2	0	(0.53		(1.10	(1.35	1	(-	1	
		(-	(1.28	)		)	)	(-	0.72)	(-	
		0.28)	)					1.37)		1.10)	

Table 11 display the Regression results of profitability and earnings forecasting model with signaling from the split announcement. The tests are conducted 3 years after the split announcement. For robustness, the model uses both ROA and ROE (unit in percentage) as operating performance of a firm. The sample size composes of 1,508 observations consisting of 754 SD events and 754 matching firms during January 1988 to December 2015. The matching criteria are industry, price-to-book value and

market capitalization, respectively. For the testing, ***, ** and * are denoted for the significant level at 1%, 5% and 10%, respectively.

Because of the mean reversion in profitability presumption, Fama and French (2000) argue that profitability and earnings are predictable and imply that the earnings forecast results from the stock analysts follow the mean reversion in profitability and earnings. Therefore, this paper employs nonlinear partial-adjustment model for profitability model from Fama and French (2000) to test whether the signaling from the split announcement influences the profitability in the future or not. If the signaling hypothesis holds, there should be a statistically significant relationship between the signal from split announcement and the profitability prediction model. Not as this paper expected, the results of regression analysis of profitability and earnings forecasting model with signaling from the split announcement is not statistically significant for almost all variables. The reasons why the model is not suitable for predicting profitability and earnings forecasting of samples are 3 aspects. First, in the country level, it is not easy to freely move from relatively low profitable industry to relatively high profitable industry in Thailand because, in some industries,

there are high barrier to entry by patent (pharmaceutical industry), capital requirement (banking and insurance) or high technology development (telecommunication). Some industries are oligopoly or even monopoly in nature such as utility and energy sectors; therefore, firms cannot move easily as in the competitive environment. Secondly, there is no mean reversion stage in Thailand yet because Thai economy is quite small and has a huge room for growth in the future. Unlike the US economy that stay in the steady stage of economy with the low economic growth phase, Thai firms can enjoy the excess profit in various industries by not competing among one another. Lastly, firms that announce to split their shares in the samples are mostly mid and small market capitalization firms. Contrasting to large firm, profitability of mid and small firms is so volatile in each year; therefore, mean reversion might not exist to this group of mid and small samples.

The relationship between return during the split announcement and split factors

In this testing, this model (3) examine the association of market inferences of firm value and unexpected components or the signaling from split factors. Return during the stock split and stock dividend (ANNRET) represent the reaction of investor around the stock split and stock dividend announcement date on the available public information. Considered as a split factor signal of the management's private information, spfc is the residual term from the model (1) which control both pre-split price, market value of equity and liquidity. This model finds that the coefficient of the signals- spfc is positive and significant at 95 percent. It means that there is association between investor's viewpoint about firm value and the choice of stock split factor as a signal of management's private information. Therefore, public investors interpret the split announcement as a good sign of a firm. In the next section, this study will investigate what are the components inside the spfc term which can explain the SD announcement return.

Table 12: regression results: announcement return prediction errors and signal from split factor

$$\text{ANNRET}_i = b_1 + b_2 \text{spfc} + e_2$$

b_1	-0.0146967 (-1.05)
b_2	0.0057612** (2.03)
Number of observation	1,508
R^2	8.35%

Table 12 show the regression results of signaling from choice of split factor (SPFAC) on stock split and stock dividend announcement return (ANNRET). The sample size composes of 1,508 observations consisting of 754 SD events and 754 matching firms during January 1988 to December 2015. The matching criteria are industry, price-to-book value and market capitalization, respectively. For the testing, ***, ** and * are denoted for the significant level at 1%, 5% and 10%, respectively.

The Relationship between announcement period returns and proxies of signaling hypothesis

Observing that there are abnormal returns during the split announcement, this paper want to analyze the sources of return around that period. There are 2 main hypotheses that try to explain this phenomenon such as signaling and liquidity hypothesis. While, in short, signaling hypothesis indicate that split announcement conveys the private and positive information about the future performance of a firm

to the market, liquidity hypothesis suggests that splits improve liquidity of stock trading and liquidity is priced and raise the stock price up.

Because the model (2) displays the estimation results that there is a positive association between the choice of split factor and the earnings forecast errors, the investors can revise the stock split as a signal about the firm's future earnings performance. The revision of investor about the firm value at the SD announcement should relate to the forecast error of a firm. The residual term in Model (2) - $uspfc$ is the explaining variable of the split factor signal which is not correlated earnings with forecast errors or the operating performance model.

In the model (4), the model has not only the operating performance improvement as explaining variables of the SD announcement return, but the 6-month liquidity improvement is also added in this model according to the liquidity hypothesis. The error term- $uspfc$ represent the other component of the split factor signal.

For the robustness, there are 7 sub models in model (6) with different variables as a proxy for operating performance improvement such as 1 year analyst forecast error, change in 1 year operating performance (ROA and ROE) for measuring short-term and 3-year operating performance (ROA and ROE) for measuring long-term. This paper run a multivariate regression to compare the consistency of the results.

The regression result of the Model (6.1) shows that the earnings forecast errors cannot explain the return prediction error during the SD announcement because the coefficient is insignificant. Similarly, the error term- $uspfc$ is not significant at any level of the confidence. The only one component which can explain the return prediction error during the SD announcement is the liquidity improvement over 6 months before and after the SD announcement. The coefficient is positive and strongly significantly associated with return prediction error during the SD announcement.

With different variables for the improvement in operating performance, model (6.2) to (6.6) use the change in ROA and ROE to be the variable for the improvement. This paper employ $uspfc_2$ (for ROA) and $uspfc_4$ (for ROE) as a portion of $spfc$ that is not explain by operating improvement after controlling for pre-announcement return. In the multivariate regression, the variables of the signal – both $uspfc_2$ (for ROA) and $uspfc_4$ do not statistically significant. Besides, the results show that the signaling hypothesis does not exist in the test because, in both short and long timeframe of measuring operating performance, the coefficient of $\Delta OP_{i,0to1}$ and $\Delta OP_{i,0to3}$ are not statically significant. The results are consistent with the Model (6.1) which uses 1 year earnings forecast errors. Therefore; the results do not support the hypothesis that firms employ split announcement to convey or signal the improved performance in the future. The results are in line with Asquith et al. (1989). They indicate the significant improvement in earnings four years before the splitting announcement and the major increase in earnings happens in the announcement year. They do not find any statistically significant increase in earning after the announcement. The results show that splits do not convey or signal the

future performance and they seem to convey about the good past performance not the future performance.

From table 13, the liquidity improvement over 6 months before and after the SD announcement is the only one explanatory variable that is strongly significant in all 7 sub models. The result suggest that split can improve the trading liquidity of stock and the market prices in the improvement, the stock price goes up. Because of illiquid stock, investors require more of the liquidity premium and rise the overall cost of equity. Split announcement or stock split as investor's viewpoint can improve liquidity of the trading stock, then there would be the abnormal return during that the announcement. In addition, the results are consistent with Lin, Singh and Yu (2009). They demonstrate that splitting can improve trading liquidity by reducing trading cost and cost of capital of the firms.

Table 13: Multivariate regression results of announcement return prediction errors, split factor signal and liquidity improvement

$$ANNRET_i = C_1 + C_2LIM_i + C_3uspf_c + C_4FE_i + C_5\Delta OP_{i,oto1} + C_6\Delta OP_{i,oto3} + \epsilon_i$$

ANNRET _i	(6.1)	(6.2)	(6.3)	(6.4)	(6.5)	(6.6)	(6.7)
C1	-0.884 (-0.670)	-0.818 (-0.620)	-0.908 (-0.680)	-0.901 (-0.690)	-0.981 (-0.750)	-1.082 (-0.830)	-0.990 (-0.760)
C2	0.896*** (9.88)	0.895*** (9.87)	0.896*** (9.88)	0.895*** (9.87)	0.894*** (9.89)	0.897*** (9.92)	0.895*** (9.90)
C3	0.629 (1.160)	0.606 (1.110)	0.640 (1.170)	0.639 (1.190)	0.644 (1.24)	0.713 (1.340)	0.666 (1.250)
C4	-0.024 (-0.650)	-	-	-	-	-	-
C5	-	0.000 (0.410)	-	0.000 (0.330)	0.000 (0.620)	-	0.000 (0.490)
C6	-	-	-0.001 (-1.260)	-0.001 (-1.240)	-	-0.001 (-1.380)	-0.001 (-1.330)
Adjusted R ²	6.5%	6.6%	6.7%	6.6%	6.6%	6.7%	6.7%
Sample sizes	1,508	1,508	1,508	1,508	1,508	1,508	1,508

Table 13 show the multivariate regression results of Model (4) to test the return around announcement with proxies for signaling hypothesis (improvement in operating performance), the residual portion from spfc after controlling for the management's information and liquidity improvement of stock. The sample size composes of 1,508 observations consisting of 754 SD events and 754 matching firms during January 1988 to December 2015. The matching criteria are industry, price-to-book value and market capitalization, respectively. For the testing, ***, ** and * are denoted for the significant level at 1%, 5% and 10%, respectively.

Moreover, the presence of no trading day is diminished and the improvement in liquidity has a positive relationship with the announcement return, meaning that the abnormal return during the split announcement could be partially explained by the liquidity improvement in splitting firms. Another reason for the improvement in liquidity, in the trading agent aspect, by Dhar et al. (2003) is that there is more individual investors buy the stock after the splitting event.



Chapter 6

Conclusions

Even though stock split and stock dividend announcement have no effect on stockholders' wealth in accounting perspective because it seems like a cosmetic transaction of a firm, there is an increasing number of Thai firms, especially after 2009, split their share. Found the abnormal return around the split announcement period, this paper examines the incentives behind the split transaction and the sources of abnormal return during these periods. After reviewing previous literature, there are 2 broad hypotheses that explain the incentive of a firms to split share. First, signaling hypothesis indicates that firm convey favorable and private information about future performance through split announcement. Secondly, liquidity hypothesis shows that firms split their share to improve liquidity of trading stock.

Using 799 observations of stock split and stock dividend during 1998 to 2013, this paper find that splitting firms have better operating performance one year before and after the split announcement relative to the matching firms, measured by mean

and median. Then, this paper investigates the split factor choices and find that price (positive), market capitalization(negative), forecast error by analysts (positive), operating one year before and after announcement (positive) have a relationship to the split factor. The results show that management take their forward view in future operating performance of a firm to decide split ratio.

After captured the proxies of signal by split announcement, this paper tests the signaling with the profitability and earnings forecasting model given the presumption of mean reversion. The results show signaling cannot explain the change in earning performance of a firm and Thai splitting firm samples do not fit with the model because of not competitive environment, early stage of growth of the country and volatile performance in mid and small size companies.

By regression analysis, this paper does find a strongly relationship between announcement return during the split and the liquidity improvement, not for the signaling hypothesis. Because the six-month liquidity improvement can statistically explain the return during the split period, it implies that market or outside investors

perceive stock split as for liquidity improvement purpose not for a signal of the improved operating performance in the future even though management take their forward view of future operating performance in split ratio.

In summary, the results strongly support the liquidity hypothesis that can explain the abnormal return around the split announcement of Thai firms.





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