



รายงานวิจัยฉบับสมบูรณ์

โครงการ : ความถูกต้องในการพยากรณ์ข้อมูลผลกำไรที่เผยแพร่ในหนังสือชี้ชวน
และความผิดปกติของผลตอบแทนที่พบในหลักทรัพย์ที่เสนอขายเป็น
ครั้งแรกต่อประชาชน: กรณีศึกษาตลาดหลักทรัพย์แห่งประเทศไทย

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31 ธันวาคม 2545

รายงานวิจัยฉบับสมบูรณ์

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Ravi Lonkani

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งานวิจัยนี้เป็นการศึกษาความถูกต้องของผลกำไรที่ได้พยากรณ์และเผยแพร่ในหนังสือชี้ชวนของหลักทรัพย์ที่ได้เสนอขายเป็นครั้งแรกต่อประชาชนของตลาดหลักทรัพย์แห่งประเทศไทย วัตถุประสงค์ของการวิจัยมีดังนี้คือหนึ่งศึกษาทิศทางและระดับของความผิดพลาดของผลกำไรที่ได้พยากรณ์และเผยแพร่ในหนังสือชี้ชวน สองทดสอบความสัมพันธ์ระหว่างความผิดพลาดของการผลตอบแทนและความถูกต้องในการพยากรณ์ผลกำไรดังกล่าว และสามเป็นการศึกษาความสัมพันธ์ระหว่างความถูกต้องในการพยากรณ์ผลกำไรดังกล่าวกับประสิทธิภาพที่วัดโดยการคำนวณผลตอบแทนหลักทรัพย์เปรียบเทียบกับผลตอบแทนของตลาดโดยรวม การศึกษาครั้งนี้ได้ใช้ข้อมูลจากหลักทรัพย์ที่ได้เสนอขายต่อประชาชนเป็นครั้งแรกจำนวน 175 หลักทรัพย์ที่มีการซื้อขายครั้งแรกในช่วงปีพ.ศ. 2534 ถึง 2539

ผลการวิจัยปรากฏว่าการพยากรณ์กำไรที่ปรากฏในหนังสือชี้ชวนมีความผิดพลาดในทิศทางสูงเกินค่าจริง และระดับความผิดพลาดของการพยากรณ์ที่วัดได้มีค่าค่อนข้างสูงเมื่อเทียบกับการพยากรณ์ลักษณะเดียวกันในประเทศอื่น อย่างไรก็ตามเมื่อเปรียบเทียบความผิดพลาดของการพยากรณ์ผลกำไรในหนังสือชี้ชวนกับความผิดพลาดของการพยากรณ์ที่คำนวณโดยใช้วิธีทางคณิตศาสตร์อย่างง่ายปรากฏว่าความผิดพลาดของการพยากรณ์ที่ปรากฏในหนังสือชี้ชวนมีค่าต่ำกว่าความผิดพลาดของการพยากรณ์โดยวิธีคณิตศาสตร์พื้นฐาน 2 วิธีคือวิธีการพยากรณ์แบบสุ่มและวิธีการพยากรณ์แบบสุ่มที่ผนวกการขยายตัวของกำไร นอกจากนี้ผลการวิจัยยังแสดงให้เห็นว่าปัจจัยที่มีความสำคัญในการอธิบายความผิดพลาดในการพยากรณ์คือมูลค่าการเสนอขายหุ้นและช่วงห่างของระยะเวลาการพยากรณ์กับวันที่ได้มีการซื้อขายครั้งแรก

เมื่อทดสอบความสัมพันธ์ระหว่างผลตอบแทนวันแรกเข้ากับความผิดพลาดในการพยากรณ์พบว่าผลตอบแทนวันแรกเข้ามีความสัมพันธ์ในทิศทางเดียวกันกับความผิดพลาดของการพยากรณ์ผลกำไรที่ปรากฏในหนังสือชี้ชวน การศึกษาความสัมพันธ์ระหว่างประสิทธิภาพของหลักทรัพย์ภายหลังจากที่ได้เข้าตลาดกับความผิดพลาดในการพยากรณ์พบว่าประสิทธิภาพของหลักทรัพย์ที่ได้เข้าตลาดนั้นมีค่าต่ำกว่าดัชนีโดยรวมและมีความสัมพันธ์ในทิศทางเดียวกันกับความผิดพลาดของผลกำไรที่พยากรณ์และเผยแพร่ในหนังสือชี้ชวน

Abstract

This research project is conducted to test the accuracy of profit forecast published in 175 prospectuses of IPOs listed in the Stock Exchange of Thailand (SET). Our objectives are based upon three issues. In the first one, we test the accuracy of profit forecast in these prospectuses. Secondly, we test whether the profit forecast error in the prospectuses can explain the well known anomaly of IPO market:-the underpricing of IPOs. Lastly, we explore the aftermarket performance of IPOs and test its relationship with the profit forecast error.

The 175 IPOs data, listed from 1991 to 1996, was used to measure the direction and its magnitude of forecast error. We then compared it with the profit forecast that was obtained from two simple models which are the random walk model and the random walk plus growth model.

We find that forecast profit reported in the offering prospectuses contain some optimistic biases. That is, the forecast profit is made higher than the actual profit. Although these profit forecast errors are relatively high compare with many stock markets in other countries, but these errors are smaller than those obtained from the simple models. We also find that the issue size and length of time that was used to report the actual profit are positively related to the magnitude of forecast profit.

Our results confirm previous research findings indicating that forecast error is a major component used to explain high initial return phenomena, or 'underpricing', observed in the many IPO markets. We also discover that two-year aftermarket performance of IPOs, in terms of cumulative market-adjusted return; have positive relationship with the profit forecast error.

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Research Paper



สำนักงานกองทุนสนับสนุนงานวิจัย

Thailand Research Fund

**The Accuracy of Profit Forecasts Published in the Offering Prospectuses
and the Return Anomalies of Initial Public Offerings:
The Case of the Thai Stock Market**

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Chapter I

Introduction

I. Introduction and Motivation

Profit Forecasts Information

Initial Public Offerings (IPOs) are new issue stocks that are offered for sale to the public by firms for the first time. For general investors, investing in IPO stocks is more risky than investing in already listed companies since information on IPOs is scarce. Lack of information and information asymmetries between management and potential investors are major uncertainties facing investors when deciding whether or not to subscribe to the new issues. In these situations, firms or issuers have to convey or signal information that can be used to value their shares. In the U.S. stock market, where issuers can distribute their shares with a high degree of discrimination (Stoughton and Zechner, 1997), their favored investors are mostly institutional investors and wealthy clients of the investment bankers who underwrite the issues. Institutional investors can make contact directly with the issuers and they participate in “road shows” put on by the IPO firm and its investment bankers. Thus, institutional investors have their own reliable sources of information; and with this information, they can make their investment decisions. In such circumstances, public information is not so important for these investors. However, this circumstance does not prevail in many countries, where, instead, IPOs are marketed directly to the general public. Thailand, for example, does not allow the issuer to discriminate against subscribers in the primary market and most subscribers or investors are individual investors (Lonkani, 2000).

It should be noted that individual investors have a relatively low capability to acquire and evaluate information on IPO stocks relative to institutional investors. Further, they have to rely on public information since they cannot make contact with issuers directly. In this market, the data contained in the prospectus typically represents a substantial proportion of the available knowledge about the firm. It follows that a profit forecast contained in the prospectus of an IPO is

potentially more important to investors (Blair and Taylor, 1989) in countries where IPOs are sold to the general public. Empirical evidence (Firth, 1998) suggests that investors do indeed rely on profit forecasts when subscribing to new issues and they use this information in pricing shares on the first day of listing. We argue that, for the Thai stock market, the profit forecast published in an offering prospectus is very important information since, as mentioned above, investors are primarily individual investors. The role of earnings forecasts in signaling the market value of IPOs and in explaining initial and longer-term stock returns has received very little attention in the finance literature. This may be due, in part, to the virtual absence of published earnings forecasts in American IPO prospectuses. This absence of earnings forecasts is likely due to the high probability of legal suits if the forecasts are proved to be inaccurate (Firth, 1998). The situation is different in the Thai stock market where forecast information about issuing firms' performances is a mandated disclosure in the offering prospectuses. The Securities Exchange Commission (SEC) in Thailand requires an IPO's prospectus to forecast the firm's future performance and publish their key financial information for the next period such as the forecast earning figures, dividend ratio, leverage ratio etc. The forecast financial statements include necessary and important information about the expected future performances of issuing firms including profit forecasts and important financial ratio forecasts.

An obvious concern about the forecasts of a firm's future profits is their accuracy and bias. To date, however, the accuracy of profit forecasts presented in offering prospectuses in Thailand have not been studied. Therefore, the first objective of this study is to examine the accuracy of profit forecasts published in offering prospectuses. The second objective of the paper is to investigate the relationship between the earnings forecast accuracy and stock returns occurring in the initial trading period of IPOs. Finally, the third objective is to see whether there is a relationship between forecast accuracy and the aftermarket performance of IPOs. Such analyses can reveal how reliable profit forecasts are in inferring the new issues' value. This evidence will be of use to investors in the initial market, especially individual investors whose decisions are based on information appearing

in the IPO prospectuses. Moreover, the results can be used to help explain the abnormal returns that are observed in initial and aftermarket trading of IPO stocks.

In summary we examine the accuracy of profit forecasts obtained from IPOs' prospectuses and compare it with the accuracy of profit forecasts from naïve prediction models. Furthermore, forecast accuracy is examined to see if it can help explain the return anomalies typically found in new issue offerings.

II. Objectives of the study

The objectives of our study can be summarized as follows:

- The accuracy of profit forecasts obtained from offering prospectuses of IPO stocks is examined and compared with simple extrapolations from historical profit data.
- Cross-sectional explanations of the magnitude of errors are tested using a regression analysis framework.
- The relationship between the accuracy of profit forecasts published in offering prospectuses and the level of initial stock returns is investigated.
- The relationship between the accuracy of profit forecasts obtained from prospectuses and the long-term stock return performances of IPO firms in the aftermarket are studied.

III. Contribution of the study

Our research will be useful for academicians, practitioners, and policy makers. For investors and financial analysts, the offering prospectus is an important source of information for making decisions as regards investing in IPOs. Our research reveals whether or not the information contained in offering prospectuses – especially profit forecast information – is valuable. Policy makers can apply the results of this research as a benchmark for determining whether or not the forecast information published by issuing firms is made with enough consideration. If forecasts are deemed unreliable then regulators may need to rethink their position on requiring forecasts. Clearly, very erroneous forecasts can undermine the very workings of the stock market. Forecasts are also open to abuse by unscrupulous businessmen. Regulators may need to impose penalties and sanctions on IPO firms and their advisors if there is evidence of widespread bias in making profit forecasts.

The remainder of the paper is structured as follows:- Chapter II discusses the listing procedures of new stocks on the stock exchange of Thailand. Chapter III is a literature review that covers both domestic and international evidence. Chapter IV explains the data and methodology. Chapter V presents and discusses the statistical results, and Chapter VI concludes.

Chapter II

Stock Exchange of Thailand

I. Stock Exchange of Thailand (SET)

In this section, we briefly describe the evolution of The Stock Exchange of Thailand (SET). Originally, the SET was set up as a consequence of Thailand's National Economic and Social Development (NESD) Plan in the year 1961. The plan defined the country's direction and growth objectives. As a consequence of rapid economic growth, the Second Plan (1967-71) incorporated planning for a new capital securities market. The Third NESD Plan (1972-76) gave rise to the SET Act of May 1974, bringing into being The Securities Exchange of Thailand, as it was first named. Securities trading commenced on April 30, 1975. On January 1, 1991, the bourse's official name was changed to The Stock Exchange of Thailand.

In May 1992, the improved SET Act of 1984 (No. 2) was replaced by the Securities and Exchange Act 1992 (SEA) which also established the Securities and Exchange Commission (SEC) as the sole supervisor of the securities business. The SEA is a comprehensive legislative framework regulating all vital elements of a modern capital market, such as disclosure, investor protection, fund management, takeover procedures and the establishment of securities firms. The SEA also provides a clear separation between the primary and secondary markets in order to facilitate their successful development. Both primary and secondary markets are regulated by the SEC. In the primary market, the SEC oversees and regulates issuing companies that wish to issue new securities. Issuing companies that carry out an initial public offering (IPO) or offer additional securities to the public must first apply for SEC approval and comply with its filing requirements. The SEC is then required to carefully review the financial status and operations of the company before allowing the firm to issue securities to the public. The secondary market comprises of the Stock Exchange of Thailand and the Thai Bond Dealing Center (TBDC). The Securities Exchange of Thailand has operated a fully computerized trading system since 1994. The trading system at the Stock Exchange of Thailand is divided into five boards, which are:

1. The Main Board is for the trading of common stocks, preferred stocks, warrants and unit trusts in full-board lots, not exceeding one million units of each security.
2. The Foreign Board is for the trading of stocks registered under a foreigner's name.
3. The Big Lot Board is for the trading of all securities with the minimum value of 3 million baht or the minimum volume of 1 million shares.
4. The Odd Lot Board is for the trading of common stocks, preferred stocks, warrants and unit trusts in less than an on board lot.
5. The Special Board is for the trading of government and state enterprise securities, i.e., bonds, debentures and convertible debentures.

II. Initial Public Offerings in the Thai Stock Market

Ever since the SET was established, a large number of firms have utilized this market as a major source of funding. The level of IPO activity can be conveniently divided into three periods which correlate with the economic conditions in Thailand. The first period is called the 'initial' or 'starting' period (from 1975 to 1986). During this period, there were few IPOs listed on the market. The second period is called the 'prosperous' or 'growth' period (from 1987 to 1996) when Thailand enjoyed rapid economic growth. During these years, many firms exploited the stock market as a major source for external funding. The third period is called the 'crisis' and 'after crisis' period (from 1997 to present). This period began with the Thailand and Asian financial crisis that started in July 1997. The effects of the crisis and its aftermath still linger today and, as a result, the number of IPOs is well below the heyday of the late 1980s and early and mid 1990s. Table 1 details the number of IPO firms and the periods in which they listed. The first period has 20 IPOs with an average of 2.2 IPOs per year. The second period has 317 issuing firms and an average of 31.7 IPOs per year. During 1997 - 2000, there were only eight IPOs in the market or only two IPOs per year.

III. Listing Process

Figure 1 describes the listing procedures of IPOs in Thailand. These listing processes are regulated by the Public Company Act B.E. 2535. Under this act, when the issuer receives approval from the SEC, the selling of new issue shares begins and has to be completed within 180 days as described in Figure 1. In the process of selling the new issues, the financial advisor often set up an Underwriting Syndicate to reduce the marketing risk. Participants in the distribution of the new issues can be divided into three groups as follows:

1. Managing Underwriter or the Lead Underwriter
2. Co-underwriter
3. Selling Agent

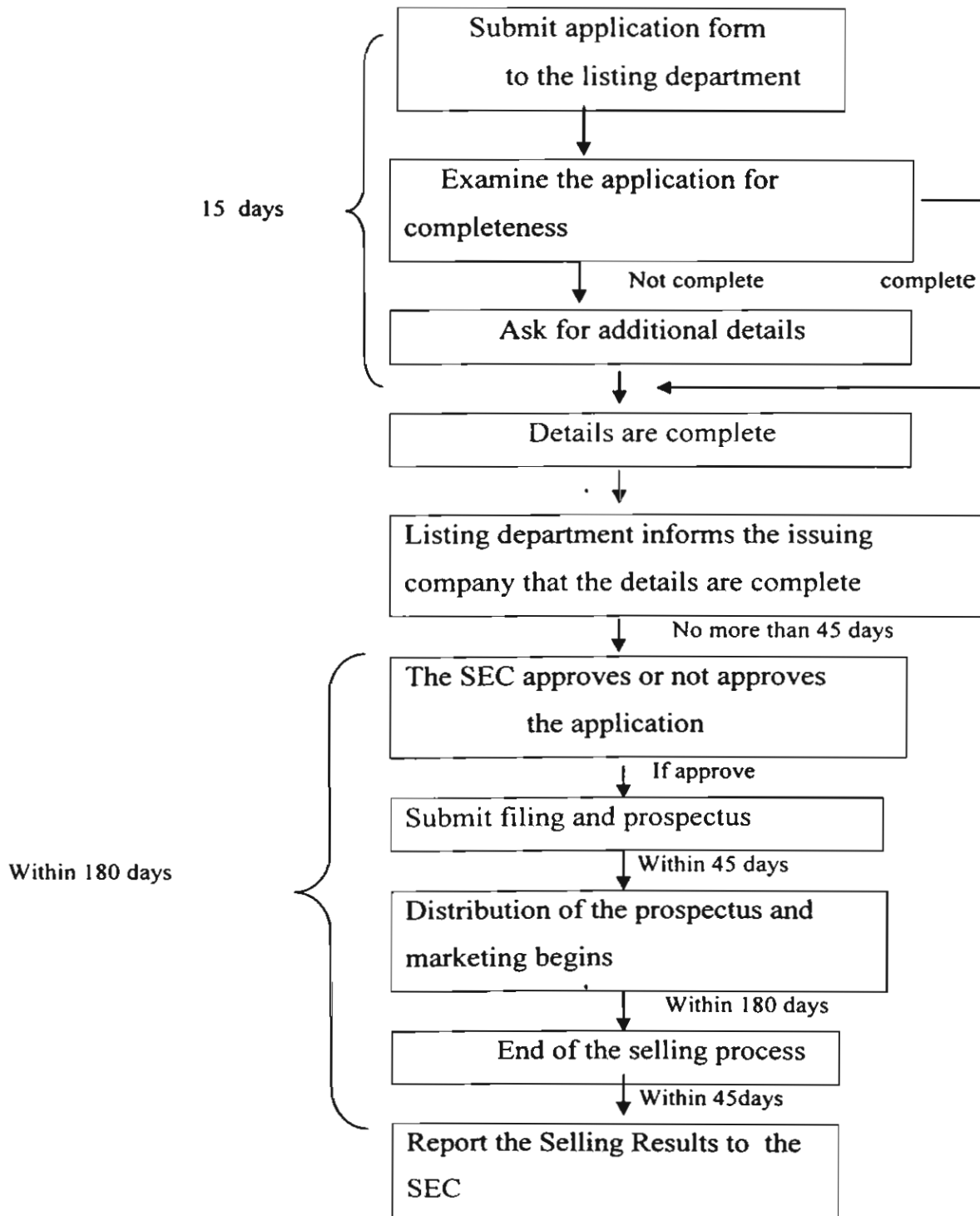
When the application is approved by the SEC, a committee from the SEC, together with the offering participants, decide on a subscription date and the financial advisor prepares the offering prospectus. The contract between issuers and other participants will specify the underwriting method, and normally there are two alternatives to select from.

1. Firm commitment underwriting. In this type, the underwriter agrees to purchase the whole issue from the firm at a particular price for resale to the public. Practically, underwriter guarantees that total shares will be sold out at a fixed offering price.
2. Best efforts underwriting. In this type, the underwriters act as a marketing agent for the firm. The underwriter does not agree to purchase the issue at a predetermined price but sells the security and takes a predetermined spread, with the firm taking the residual.

In Thailand, the underwriting contracts are entirely of the firm commitment method. When the contract is signed, participants begin their marketing process and distribute the details of the new issue including the fixed offering price via the offering prospectus or other media.

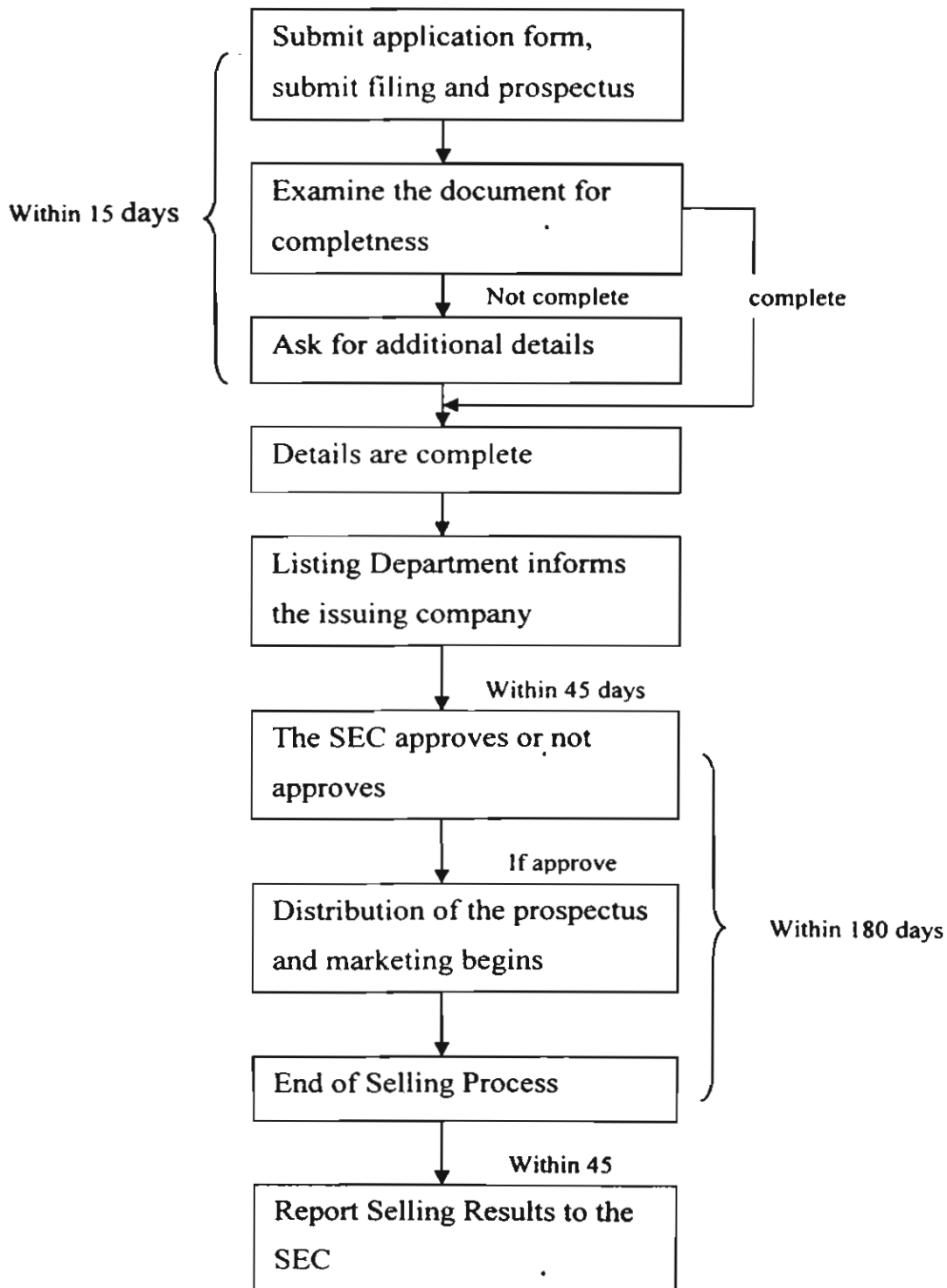
Figure 1. Process of Approval Stock for IPOs¹.

Case I. Submission of listing application and, when approved, issuing companies submit the official filing and prospectus.



¹ Source: The Securities and Exchange Commission library

Case II Submission of listing application simultaneously with the official filings and prospectus



Chapter III

Literature Review

II. IPO Underpricing: The Anomaly

There is a general consensus across research studies that new issue stocks yield very high initial returns on the first day of trading. This anomaly is generally known as the underpricing of IPOs. Many models have been developed in an attempt to explain this anomaly. For example, Rock (1986) posits that underpricing arises so as to compensate uninformed investors for participating in the offering process. Mauer and Senbet (1992) argue that incomplete spanning and limited investor access to the primary issue market are major contributions to underpricing. Benveniste and Spindt (1989) develop a model which relies on market information acquisition by investment bankers through the presale solicitations of interest. In their model, underpricing is a way of compensating 'regular investors' for revealing their private information. Regular investors, in this context, are investors who regularly participate in the primary market. The other type of investor is called occasional investors. This distinguishes capture the real-world facts that some investors participate regularly in the IPO market while others participate only occasionally. Tinic (1988) presents a simple theoretical model suggesting that underpricing may represent a form of insurance against lawsuits by disgruntled investors.

II. IPOs' Initial Returns and the Signaling Model

In a path breaking application of the signaling idea to finance theories, Leland and Pyle (1977) argue that the level of retention of shares by the original owners can be a convincing signal of firm value to outsiders. They model IPO firm value as a positive function of the proportionate share ownership of the entrepreneurs who bring the company to listing. The rationale behind the model is that entrepreneurs who retain a large investment stake in the company only do so if they are very confident about the firm's prospects. Investors recognize this

commitment by the entrepreneur and accordingly place a higher valuation on the IPO. The signaling hypothesis can also be used to explain the short-run underpricing of IPOs. In the signaling hypothesis framework, underpricing arises from attempts by issuers and underwriters to signal their private information on the values of shares. Underpricing, in this case, can be a signal of value. Various forms of the signalling model have been developed by Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989). These models improve the Leland and Pyle (1977) who use fraction of shares retained as a signaling device. The signaling model of Grinblatt and Hwang (1989), for example, predicts that high variance projects are sold at larger discounts in equilibrium. Furthermore, given any variance of returns, issuers with high value projects retain a greater fraction of shares. Underpricing is greater for higher-value projects. This signaling hypotheses works for the following reasons. When the project is valuable, the issuer wishes to demonstrate this. By issuing at a lower initial price, the issuer “proves” that the variance of the project is higher, which in turn “proves” that the issuer’s fractional holding is especially costly. Since the issuer is risk averse, they do not want to retain more shares. Discounting the price is costly but is necessary to demonstrate the worth of the signal device, which is the fraction of shares retained by issuers. Thus, the issuer would desire to inform investors when variance of project is high in order to make the fraction retained to signal informative and effective.

Downes and Heinkel (1982) provide an important early application of the share retention signal suggested by Leland and Pyle (1977) to a sample of 297 U.S. IPOs for the period 1965–1969. They operationalize Leland and Pyle’s model in the following regression equation:

$$V_j = \beta_0 + \beta_1 NK_j + \beta_2 \alpha + \mu_j, \quad j = 1, 2, \dots, n. \quad (3.1)$$

In this equation, V is the initial market valuation of the firm’s equity, α the entrepreneur’s proportionate ownership after the issue, and NK the firm’s net assets after the issue. Based on this construction, α is expected to have a negative sign in

the regression model. Downes and Heinkel (1982) and Hughes (1989) conclude that the retained ownership model is supported.

Ritter (1984) provides additional empirical evidence using a sample of 559 IPOs for the period 1965-1973. Ritter's findings cast doubt on the Downes and Heinkel (1982) results: the percentage of shares retained was not found to be a significant determinant of market value.

Beatty and Ritter (1986) propose that there is a positive relationship between the initial return and the ex ante uncertainty. Using a sample of 545 IPOs in the U.S., they find that the initial return is negatively correlated with the gross proceeds which are used as a proxy for ex ante uncertainty.

III. Profit Forecast Information from Offering Prospectuses

Profit forecasts are a potentially important piece of information for investors (Berlinger and Robbins, 1986; Firth, 1998). Firth (1998) explores the relationship between earnings forecasts and firm valuation and finds that earnings forecasts are a major signal of IPO value and that they are more important than other signalling tools such as the retained share ownership of the entrepreneurs.

The issue of accuracy of a profit forecast in the IPO prospectus has been explored at length by many researchers. Research in Australia (Lee et al., 1993), Canada (Pedwell et al., 1994) and New Zealand (Firth and Smith, 1992) reveal large forecast errors. Studies on Asian IPO markets have found relatively small forecast errors. Chan et al. (1996) and Jaggi (1997) report mean absolute forecast errors of 18% and 12.9% for listings in Hong Kong, respectively. Mixed results are reported in Malaysia. Mohamad et al. (1994) find low to moderate forecast errors, while a later study by Jelic et al. (1998) find somewhat larger errors.

Kim et al. (1995) investigate the rôle of information disclosed through the prospectus in the new issue market in Korea. The evidence indicates that the market price is significantly affected by financial variables, such as earnings per share, offer size, industry-wide prospects, and offer type. Our study, therefore, examines the importance of financial variables contained in the offering

prospectuses for the pricing of IPOs in the new issues market where information is scarce.

Firth and Smith (1992) examine the accuracy of profit forecasts contained in prospectuses of companies newly issued on the New Zealand Stock Exchange. In their paper, accuracy is measured by forecast errors, absolute forecast errors, and squared forecast errors. They find that the level of forecast accuracy appears to be poor in comparison to studies conducted in the U.K. by Dev and Webb (1972). They also hypothesize that forecast accuracy is related to the initial returns of IPO stocks. However, the empirical results provide no support for this notion. Firth et al. (1995) find comparatively high forecast accuracy for listings in Singapore. Firth (1998) further analyzes the role of the profit forecast for IPOs in the Singapore stock market. He examines 116 IPOs during the period 1977 to 1992. His results reveal that there is strong positive relationship between forecasts and market valuations. Furthermore, company management in Singapore appear to use the earnings forecast to signal firm value and the retained ownership signal is of less importance in explaining valuation. Results from analyses of stock returns in the aftermarket indicate that forecast errors are a major explanatory variable. Chen and Firth (1999) investigate the accuracy of the profit forecast and its relationship with IPO firm valuations for China IPOs. They use all IPOs made on the Shanghai Securities Exchange (SH) and the Shenzhen Stock Exchange (SZ) from 1991 to 1996. The results show that profit forecasts are moderately accurate and they are better than time series extrapolations of historical profits. Similar to Firth (1998), the paper also shows that profit forecasts are related to company valuations.

Cheng and Firth (2000) analyze the bias and rationality of profit forecasts published in offering prospectuses in the Hong Kong stock market. They employ data from 154 IPOs in the period 1992 to 1995. Results indicate that the magnitude of the forecast errors and the magnitude of the absolute forecast errors are much lower than those reported in developed countries such as Australia, Britain, Canada, and New Zealand.

IV. Initial Returns and Profit Forecasts

Firth (1997) argues that profit forecasts may help explain the magnitude of the initial returns in the first day of trading in the IPO. He posits that investors employ the 'appropriate' PE multiple to be a source of pricing for the new issue stocks. In particular, he uses the ratio of the PE multiple of a matched firm that is already listed in the market and the PE multiple of the IPO firm as a signal of, and explanation for, underpricing. Firth (1997) hypothesized that the ratio is positively correlated with the initial return, and his empirical results were consistent with this prediction. Furthermore, Firth concludes that investors are able to anticipate some of the overprediction or underprediction in IPO profit forecasts since he found a positive and significant relationship between initial returns and signed earnings forecast errors.

V. Initial Public Offerings in the Thai Stock Market

IPOs in the Thai stock market also exhibit anomalies similar to those found in other countries (Wethyavivorn and Koo-smith, 1991; Suewattana, 1993, Sribooncharoen, 1997; Kritsermvong, 1998; Lonkani, 2000). Results from these studies indicate that, in the Thai market, the first-day trading prices of IPOs are greater than their offering prices but prices substantially decline in the weeks and years after listing. We describe details of each study as follows:

Wethyavivorn and Koo-smith (1991) examine 32 IPOs that listed in the Stock Exchange of Thailand during 1988- 1989 and find that the average initial returns from this data is 58.1%.

Suewattana (1993) explores the factors that determine why firms make new issues in the Thai stock market and examines the initial returns of IPOs during 1987-1991. She finds that earnings per share, asset size, debt to equity ratio, offering size, and market condition are the main factors used in determining IPO prices; of these factors, earnings per share is the most important. Initial returns of the new issues are highest on the first day of trading and decline in the subsequent period. When initial returns are examined by industry, she finds that the highest initial returns occur in the service sectors and property development sector.

Sribooncharoen (1997) finds similar results to Suewattana (1993).

Sribooncharoen studies 79 IPOs during 1992-1993 and discovers that the IPOs seem to be underpriced for only for a short period of time. The average initial return is 34.57%. Furthermore, this study also found a decline in stock performances of the new issues subsequent to their offering. Specifically, both the 3-year holding period returns and the operating performances decline in the after market (operating performance is measured using the return on assets, total asset turnover, EPS, and M/B).

Kritsernvong (1998) studies the underpricing of the Thai stock market. He separates the whole sample into two sub-periods. The first sub-period is during 1992 to 1994 which is the period before the SEC announced rules relating to the fairness of allocating new stock in the primary market. The second period is 1994 - 1996 which is after the announcement of this rule. He finds that the first sub-period sample of IPOs exhibits more underpricing than the second sub-period sample. This finding is consistent with Rock's (1986) implication which asserts that underpricing arises from the intention of issuers to encourage uninformed investors to participate in the offerings and any device that reduces information asymmetry should increase prices and reduce initial returns. Since the SEC regulation enhances the accessibility of information to individual investors (who are classified as uninformed investors), underpricing should decrease after the implementation of these rules (July 1994).

Lonkani (2000) reports that, on average, the first day stock return of IPOs is 46.7%. He used the sample of 292 IPOs during 1987 - 1997. He found that the degree of underpricing is positively correlated with percentage of shares allocated to institutional investors and to foreign investors. Those initial returns, in contrast, are negatively correlated with number of shares allocated to individual investors. In the aftermarket, the performance of IPO stocks is worse than the market average, and the industry and size-matched portfolio. The 3-year cumulative adjusted average returns (CARs) for IPOs during 1988-1993 are -55.30%.

Chapter IV

Data and Methodology

I. Data

The principal source of the data is the I-SIM database, which is the official database provided by Securities Exchange of Thailand or SET. These data include price and return information, the offering price, size, age, and other listing information of new issue firms. IPOs' earnings forecasts are not available in this database and so we collect it manually from the offering prospectuses in the SET's main library. In this study, all offerings having relevant information during the period of 1991 to 1996 are examined. We choose this period because the 1991 to 1996 period is the period that has substantial IPO activity (see Table 1). Although the SEC began to enforce the publishing of forecast financial information from 1992, some new issue firms published forecast information before 1992. Thus, the data used for this study began in 1991. Since the Asian economic crisis began in 1997, we ignore the 8 issues after this date. According to I-SIM, there were 254 new issues between 1991 and 1996. However, for some, there is not enough information available to analyze the returns in the primary market or in the secondary market. After excluding IPOs that had incomplete information, we are left with a total of 175 firms in our sample. The distribution by year of offerings is shown in Table 2; the number of offerings was highest in 1991 and lowest in 1995. Table 3 shows the industry breakdown of IPOs between 1991 and 1996. The average market sizes, including maximum and minimum market capitalization, are shown in Table 4. Market size is measured in terms of numbers of shares multiplied by issue price. On average, our sample of IPOs has a market capitalization of 8778.8 million Baht at the offering prices. The top five issues by size are Jusmine International Public Company (JASMIN), Telecom Asia Corporation (TA), Thai Airways International (THAI), KrungThai Thanakit Finance (KTT) and Sri Thai Superware Public Company (SITHAI).

II. Forecast error metrics

The procedures for measuring forecast errors are taken from Cheng and Firth (2000). The first type of error is called the forecast error which is the difference between the actual profit and the forecast profit and scaled by the absolute value of the actual profit. Thus:

$$FE = (AP - FP) / |AP| \quad (4.1)$$

where

FE = forecast error; AP = actual profit; and FP = forecast profit.

For the purpose of comparison, we also compute forecasts error using the forecast profit as the denominator which this method is used in many relevant papers (Firth (1998), Chen and Firth (1999))

The second profit forecast error is given by the absolute forecast error (AFE):

$$AFE = |FE| \quad (4.2)$$

The interpretation of these two versions of the forecast error is that the FE indicates the direction of bias of the forecast error while the AFE indicates the overall level of accuracy. A positive mean value for the FE implies a pessimistic bias where forecasts are less than actual. Conversely, a negative mean value for the FE indicates an optimistic bias where forecasts are higher than actual profits.

The absolute forecast errors (AFE) are compared against the errors obtained by using simple statistical time series extrapolations of historical profits. Information in a prospectus provides historical data of profits for the three years prior to the offering. Therefore, the statistical models used here are implementable in practice. Two time series models are examined; they are the random (RW) model, in which the forecast profit (RWF) is the latest profit before listing (AP_{t-1}), and the growth (G) model, in which the forecast profit (GF) is AP_{t-1} multiplied by one plus the annual compound growth rate of profits over the two years prior to listing. The absolute errors from these statistical models, AFE (RW) and AFE(G), are calculated as:

$$AFE (RW) = |(AP - RWF)/AP| \quad (4.3)$$

$$AFE (G) = |(AP - GF)/AP| \quad (4.4)$$

To test whether managements' forecasts of profits are better than the statistical models we calculate DIFF (RW) which is the difference between AFE (RW) and AFE. DIFF (G) is the difference between AFE (G) and AFE. The hypothesis here is that profit forecasts obtained from prospectuses are more accurate than naïve statistical models. The hypotheses in alternative forms can be written as:

$$H1: \text{DIFF (RW)} = \text{AFE(RW)} - \text{AFE} > 0$$

$$H2: \text{DIFF (RG)} = \text{AFE(G)} - \text{AFE} > 0$$

Another approach to comparing the value of IPO profit forecasts with simple naïve models is to employ the superiority measure as used by Brown et al. (1987). The models are:

$$\text{SUP} = \log\left(\left[\frac{\text{AP}_t - \text{AP}_{t-1}}{\text{AP}_t - \text{FP}_t}\right]^2\right) \quad (4.5)$$

$$\text{SUPG} = \log\left(\left[\frac{(\text{AP}_t - \text{AP}_{t-1}) \times G}{\text{AP}_t - \text{FP}_t}\right]^2\right) \quad (4.6)$$

The SUP and SUPG are the superiority of IPO earnings forecasts over the random walk model and the growth model, respectively. Therefore, the hypotheses in alternative forms are:

$$H3: \text{SUP} > 0$$

$$H4: \text{SUPG} > 0$$

Here t-statistics are used to test H3 and H4.

A third approach to measuring accuracy, and one which captures the bias, is the methodology of De Bondt and Thaler (1990) and Capstaff et al. (1995). Following their methodology, the actual changes in profits are compared to forecast changes in profits. This is done via the following regression model:

$$(\text{AP}_t - \text{AP}_{t-1})/\text{AP}_{t-1} = \alpha + \beta(\text{FP}_t - \text{AP}_{t-1})/\text{AP}_{t-1} \quad (4.7)$$

where the variables are as described earlier with α and β being estimated by regression analysis. The null hypotheses we test imply $\alpha = 0$ and $\beta = 1$. If $\alpha < 0$, then a profit forecast is interpreted as having an optimistic bias (predicted profits exceed actual profits). Conversely, $\alpha > 0$ is interpreted as having a pessimistic bias. $\beta < 1$ is interpreted as an overreaction to available information (e.g. AP_{t-1}) and

$\beta > 1$ is interpreted as an underreaction to available information (Capstaff et al., 1995). An alternative model is to multiply AP_{t-1} times one plus the compound growth rate in profits in the three previous years (G). Our hypothesis in alternative form is:

$$H5: \alpha = 0 \text{ and } \beta = 1$$

We use the SPSS software to conduct all the statistical tests.

III. Cross-sectional Explanations for the Forecast Error

We examine factors that may explain the magnitude of forecast errors. In our tests, we employ cross-sectional regression models where the absolute forecast error enters as a dependent variable. Explanatory variables are composed of 5 variables; the new issue size ($SIZE$), the age of the IPO firms (AGE), the coefficient of variation in the 3-years' of earnings of the IPO before its listing date ($VARIAT$), the leverage ratio ($LEVER$), and the approximate length of time ($LENGTH$) of the forecasting period:-the difference between the listing date and fiscal year end. Since there is no data of prospectus date in the ISIM database, we use the listing date to be the estimation of the prospectus date. The regression model is:

$$AFE = \alpha_0 + \alpha_1 SIZE + \alpha_2 AGE + \alpha_3 VARIAT + \alpha_4 LEVER + \alpha_5 LENGTH \quad (4.8)$$

Where

AFE = is the absolute forecast error as measured in equation 2;

$SIZE$ = is the market capitalization of the new issues as measured by the product of the amount of shares issued in the IPO and the offering price;

AGE = is the logarithm of number of years since the IPO firm was established;

$VARIAT$ = is the coefficient of variation of the last 3-year earnings of the IPO before listing;

LEVER = is the total debt divided by total assets of the new issue firms;

LENGTH = is the number of days between the listing date and the fiscal year end;
and

MKT is the monthly return of the stock market in the same month of the issue date.

The rationales for including these factors are based on previous theory-based and empirical-based research, outlined as follows. SIZE is a proxy for the capability of firms to forecast earnings with more accuracy (Firth et al., 1995). Large firms are believed to have more resources to devote to making forecasts. Therefore, we expect a negative relationship between SIZE and AFE. In a similar fashion to SIZE, older firms should have more experience in making profit forecasts and are expected to forecast better than younger firms (Lee et al., 1993). We therefore expect AGE to be negatively correlated with AFE. Since VARIAT represents the fluctuation in earnings before its listing in the secondary market, this variable should be positively correlated with AFE. LEVER is another measure of the risk of a company and high-risk firms are expected to be positively correlated with AFE (Eddy and Seifert, 1992). LENGTH is predicted to be positively correlated with the forecast error based on the argument that the longer the horizon times, the more difficult it is to forecast accurately (Firth et al., 1995). Finally, MKT enters the model as a control variable. Previous research conjectures that there is higher probability of error in forecasting when the market is rapidly changing (Cheng and Firth, 2000).

IV. Initial Returns and Aftermarket Performance Measurement

The initial return (IR) is measured as the difference between the first-day trading price (FT) of the IPO stock and the offering price, divided by the offering price {space here}(OP), or

$$IR = [(FT - OP) / OP] \times 100 \quad (4.9)$$

The aftermarket performance of IPOs is measured using the monthly benchmark-adjusted returns, as in Ritter (1991).

The monthly benchmark-adjusted return is defined as the monthly raw return on a stock minus the monthly benchmark return for the corresponding period. It is calculated for each IPO for 36 consecutive months. Month, in this case, is defined as a successive 21-trading-day period relative to the IPO date. Month 0 is defined as the initial return period, Month 1 consists of event days 2- 22; Month 2 consists of event days 23-43, and so on. The benchmark used is the SET index. The benchmark adjusted return for stock i in event month t is defined as:

$$ar_{it} = r_{it} - r_{mt} \quad (4.10)$$

The average benchmark-adjusted return on a portfolio of n stocks for event month t is the equally weighted arithmetic average of the benchmark-adjusted returns:

$$AR_t = \frac{1}{n} \sum_{i=1}^n ar_{it} \quad (4.11)$$

The cumulative benchmark-adjusted aftermarket performance from event month q to event month s is the summation of the average benchmark-adjusted returns:

$$CAR_{q,s} = \sum_{t=q}^s AR_t \quad (4.12)$$

VI. Profit Forecast Accuracy and Initial Returns

The regression model we use to test the relationship between the initial stock returns on an IPO and the forecast error is taken from the model of Chen and Firth (1999). According to the model, the issue price is a function of the profit forecast and the 'underpricing' is a fixed percentage. Then, any variation in the initial return may be a function of investors' perception of the profit forecast accuracy (the ex ante perceptions being proxied by the ex post realizations of forecast errors). The model is

$$IR = \beta_0 + \beta_1 FE + \beta_2 PEMR + \beta_3 SIZE + \beta_4 AGE + \beta_5 MAK T \quad (4.13)$$

Where

- IR = percentage return on the IPO stock on the first day of trading;
 FE = percentage forecast error given by equation 1;
 SIZE = Gross proceeds of the IPO in million Baht;
 AGE = natural log of number of years since the IPO firm was incorporated;
 MAK T = market return at the same date as the issuing date of the IPO; and
 PEMR = price earnings relative calculated as the PE of a matched firm divided by the PE of the IPO firm. The PE of the IPO firm is the issue price divided by the forecast earnings per share.

A positive sign is hypothesized on the FE variable (Firth, 1997; Chen and Firth, 1999). Another approach to explain the relationship between forecast accuracy and initial returns is the model of Benveniste and Spindt (1989). According to this model, the initial return is a positive function of uncertainty which can also be proxied by FE. In other words, the higher the forecast error, the higher the uncertainty and the larger the underpricing.

Firth (1997) posits that one stock valuation technique used by investors and financial analysts is to multiply the published profit forecast by an 'appropriate' price earnings (PE) ratio. In the initial public offering, the appropriate price earnings ratio can be deduced from the PE ratios of firms already listed on the market. Therefore, the expected initial stock return is a function of the proportionate difference in price earnings ratios, i.e., the ratio used by the issuer and the 'appropriate' ratio. In order to test this conjecture, the ratio between the price earnings ratio of a matched listed firm (the appropriate ratio) and the price earnings ratio of the IPO firm is calculated; this variable is denoted PEMR. According to Firth (1997) the expected sign for PEMR is positive. Match Firm used is the company that listed in the Market at least two year prior to the IPO firm and is in the same industry of IPO firm.