THE IMPACT OF THE STOCK MARKET LIBERALIZATION ON THE FIRM VALUE OF EQUITY, INVESTMENT, AND PERFORMANCE: THE CASE OF THAILAND

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Dedicated to my father and my mother

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PREFACE

This study examines the effect of stock market liberalization in four main areas that are the revaluation effect of the firm stock return, firm investment rate and firm cost of capital, and firm performance. The study uses annual firm-level data in the Stock Exchange of Thailand from 1976 to 2003. The total number of firms in this study is 469 firms in 31 sectors. The revaluation effect of firm stock return is composed of the effect on the Main board and on the Alien board. The years 1985, 1987, and 1991 are the stock market liberalization years, based on significant liberalization events that occurred in those years. I analyze the pre, during, post, and after effects of stock market liberalization on firm stock return, firm investment rate, firm cost of capital, and firm performance. I compare the effect of the stock market liberalization to two years before liberalization level. The main focus is on the during and post-liberalization effects of liberalization and the effect of the 1987 stock market liberalization on the firm stock return revaluation, firm investment and cost of capital, and firm performance.

In analyzing the effects, I first controlled for firm differences and later for sector differences. The firm Main board stock return declines from the pre-liberalization level during the 1985 stock market liberalization, increases in the post-liberalization, and falls again in the after-period of the liberalization. A change in firm size in during, post and after period of 1985 liberalization does not affect the firm Main board stock return. The 1987 stock market liberalization positively affects the firm Main board stock return

during the 1987 stock market liberalization takes place but negatively affects the firm Main board stock return later on. A change in firm size in during, post, and after-periods of the 1987 stock market liberalization does not affect the revaluation of the firm Main board stock return.

The firm investment rate significantly declines from the pre-liberalization level following the 1985 liberalization during the liberalization takes place but significantly increases from the pre-liberalization following the 1987 liberalization during the liberalization takes place when no controlled variables are included. The effect of the 1987 stock market liberalization on firm investment is quite large since the firm investment rate increases from the pre-liberalization level in during, post, and after-periods of the 1987 stock market liberalization. When control variables are included in the estimation, the firm investment rate still significantly increases from the pre-liberalization level in the post and after liberalization periods. The firm cost of capital significantly declines following the 1985 and 1987 stock market liberalization. The 1987 stock market liberalization causes a reduction in firm cost of capital in during, post, and after-liberalization periods while the 1985 stock market liberalization causes a reduction in firm cost of capital in the post and after-liberalization periods.

Firm performance significantly improves from the pre-liberalization level in the post and after liberalization periods following the 1985 and 1987 liberalization regardless of which firm performance proxy is used. The improvement in firm performance is strongest when the liberalization year is 1987 since both firm performance proxies show a significant improvement in firm performance in the during, post, and after periods of

the 1987 liberalization. The improvement in firm performance is much stronger when Tobin's Q is used as a proxy of firm performance instead of ROA.

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TABLE OF CONTENTS

Chapter Page

LIST OF TABLES

Table Page

Table Page

LIST OF FIGURES

Figure Page

CHAPTER I

INTRODUCTION

A. Motivation

The economic and financial crises in emerging countries prompted many academics and researchers to question the merit of financial and capital liberalization. Joseph Stiglitz of the World Bank and Paul Krugman of MIT have favored capital controls (Kim and Singal, 2000). In contrast, economists such as Merton Miller reason that the financial crisis has occurred because markets are not open enough and that some existing controls needed to be removed (Kim and Singal, 2000). Although some economists have favored capital controls, global markets have moved toward capital liberalization. Stock market liberalization is one form of financial liberalization. By liberalizing the stock market, countries allow foreign investors to participate in their stock markets through buying and selling domestic shares. Stock market liberalization is also a specific element of capital account liberalization since it removes restrictions on capital inflows and capital outflows. Stock market liberalization affects both the financial and the macroeconomic development of countries. It is thus a particular type of policy that may help to promote financial and economic development (Fuchs-Schundein and Norbert Funk, 2001).

For emerging countries, there are several potential advantages of opening their stock markets to foreign investors. Liberalization stock markets represent an important opportunity to attract foreign capital to finance economic growth (Kim and Singal, 2000). It is argued that stock market liberalization is related to long-run economic growth (Levine and Zervos, 1998). Because stock market liberalization, besides allowing foreigners to own domestic securities allows domestic investors to obtain external financing from abroad, it is argued that firms that need external financing in economies that are liberalizing their financial sectors will grow disproportionately faster than those in economies that are not liberalizing their financial sector (Das, 2003). Furthermore, by comparing countries with differences in the development of financial markets, Rajan and Zingales found that development of financial markets facilitates economic growth by reducing the cost of external financing (Kim and Singal, 2000). It is also argued that the international risk-sharing through global diversification results in improved resource allocation (Obstfeld, 1994).

However, we must compare the benefits of stock market liberalization with the uncertainty associated with it. One major concern is the movement of hot money, which is an international flow of funds allegedly highly sensitive to differences in interest rates, expectations of future economic growth, and expected returns from holding securities (Kim and Singal, 2000). Therefore, given this investment sensitivity, even a small shock to the economy might lead to a volatile change in fund flows, which exacerbates the shock or can destabilize the domestic economy (Kim and Singal, 2000). In addition, it is argued that stock market liberalization might lead to an increase in volatility in stock

prices. This might make investors demand higher risk premiums, which implies higher costs of capital and less investment (Kim and Singal, 2000).

B. Objective

This dissertation attempts to capture the effect of stock market liberalization. The primary focus of this dissertation is on the revaluation effect of stock market liberalization. In addition, this dissertation also tries to identify the effect of stock market liberalization on firm investment rate and firm cost of capital. Lastly, this dissertation also tries to identify the effect of the stock market liberalization on firm performance. In evaluating the effect of stock market liberalization, I look at pre, during post, and after effects, with the main concentration on the effect in during and post stock market liberalization. The estimation will be controlled for firm differences and then later for sector differences. This dissertation focuses on Thailand since Thailand has employed a series of financial liberalization policies over decades. Two alternative liberalization years are studied since stock market liberalization is a gradual process and the events that occurred in those years are considered major liberalization events. The liberalization years are 1985 and 1987, respectively since those years have the significant liberalization events. In analyzing the revaluation effect of the firm stock return on both firm Main board and Alien board, 1991 is used as the additional liberalization year since the firm Alien board share price started to appear on the Alien board in 1988 and 1991 is another year that had significant liberalization event. Annual firm-level data from 1976 to 2003 are used for this study. The sample firms are those listed in the Stock Exchange of Thailand (SET). The firms that are used in this study are 469 firms in 31 sectors. In

addition to the whole sample dataset, sub-sample datasets that contain only firms with observations before and after each liberalization year are also used in the estimation to identify whether the effect of the stock market liberalization is different when estimation is applied to the smaller datasets.

C. Contribution

The purpose of this dissertation is to identify the effect of stock market liberalization on three main areas: the revaluation of firm Main board and Alien board stock return, the effect on firm investment rate and firm cost of capital, and the effect on firm performance using two different liberalization years. This study provides a better understanding of the true effect of stock market liberalization on three main related areas; because stock market liberalization induced capital inflows into the economy, it will certainly affect those three related main areas. Rather than focusing on a single liberalization year, this dissertation uses two different liberalization years, thereby showing the different effects of stock market liberalization in different liberalization years.

D. Main Finding

The effects of the stock market liberalization on firm stock return, firm investment rate/firm cost of capital, and firm performance vary depending on the year of liberalization. The magnitude of the increase also varies depending on the year of liberalization as well. The immediate impact of the 1985 stock market liberalization on firm Main board stock return is negative. In addition, since there was only one trading board during the period of the 1985 liberalization along with the foreign ownership limit

that constrained foreigners to trade shares within specified limit, these factors might have caused the revaluation effect of the 1985 stock market liberalization to be lower than expected. A change in firm size in during, post, and after period of the 1985 stock market liberalization does not affect the firm Main board stock return. The inauguration of the Alien board in 1987 to facilitate foreign investment causes an immediate positive impact on the firm Main board stock return. The firm Main board stock return increases from the pre-liberalization level during the 1987 stock market liberalization. The firm Main board stock return then declines in the post and after-liberalization period. Firm size in the during, post, and after-period of the 1987 stock market liberalization does not affects the revaluation effect of the firm Main board stock return.

For the Alien board stock return, the 1991 stock market liberalization negatively affects the firm Alien board stock return during the year that liberalization takes place. A change in firm size in during, post, and after period of the 1991 stock market liberalization does not affect the firm Alien board stock return. A different ability in utilizing information among foreign and local investors might be one factor that drives up the difference in the revaluation effect of the firm Main board and firm Alien board.

In the firm investment rate/ firm cost of capital and firm performance sections. The firm investment rate immediate declines from the pre-liberalization level following the 1985 stock market liberalization while immediately increases from the pre-liberalization level following the 1987 stock market liberalization. The estimation with no control variables shows that the firm investment rate significantly increases from the pre-liberalization level in during, post, and after-period of the 1987 stock market liberalization. When control variables are included, the firm investment rate is still

significantly higher than the pre-liberalization level in the post and after liberalization periods. An increase in firm investment rate following the liberalization is consistent with the International Asset Pricing Model since it predicts that the cost of capital should decline following the liberalization. When the cost of capital declines the expected return increases thereby the firm share price should rise. As the firm share price increases, this will increase the Tobin's Q. The change in Tobin's Q value as a result of the stock market liberalization will drive the subsequent adjustment in the firm's capital stock (Chari and Henry 2005). Therefore, the inauguration of the Alien board in 1987 has the strongest immediate positive impact on firm investment rate.

For the effect of liberalization on firm cost of capital, the firm cost of capital immediately declines from its pre-liberalization value following the 1985 and 1987 stock market liberalizations. In addition to a reduction in firm cost of capital following the 1985 and 1987 liberalizations in the post and after liberalization periods, the cost of capital also falls in the during liberalization period. Thus, the inauguration of the Alien board in 1987 is considered a major liberalization event since the firm cost of capital falls and investment increases following the 1987 liberalization.

For the effect of stock market liberalization on firm performance, firm performance significantly improves following the 1985 and 1987 stock market liberalization. In addition to a significant improvement in firm performance following the 1985 and 1987 liberalizations in the post (POSTLIB) and after liberalization periods (LIBAF), firm performance also significantly improves in the during liberalization period (LIB0) following the 1987 liberalization. Therefore, an inauguration of the Alien board in 1987 has a large positive impact on firm performance. Therefore, during the year of the

liberalization, the 1987 stock market liberalization positively affects the firm Main board stock return, firm investment rate, and firm performance and causes a reduction in firm cost of capital following the liberalization.

E. Organization

This dissertation is organized into six chapters. The second chapter contains the literature review, which discusses previous studies of the effects of the stock market liberalization. The third section, the history of the Stock Exchange of Thailand, includes the liberalization process, the liberalization policies, and the policies to promote foreign investments. The fourth section is the methodology issues and data. This section discusses the datasets used to conduct this study and the methodology used to evaluate the effects of stock market liberalization in the three main areas of study. The fifth section is the findings section. This section discusses the findings related to the effect of stock market liberalization in the three main areas of study in the three different liberalization years. The sixth section is the summary.

CHAPTER II

LITERATURE REVIEW

Levine (2001) argued that international capital flow liberalization is a useful policy tool for a country seeking to boost stock market development. He also argued that international financial integration can boost the operation of domestic financial systems and thereby stimulate improvement in resource allocation and faster economic growth (Levine, 2001). Many studies look at the effect of stock market liberalization. Most studies address the effect of stock market liberalization at the aggregate or country level. Most of the literature on stock market liberalization focuses mainly on the revaluation effect of stock market liberalization. The effects of stock market liberalization are also studied in the area of cost of capital, investment, economic growth, market efficiency, and market liquidity. In addition to country-level studies of the effect of stock market liberalization, studies of the firm-level effect have been also done. Chari and Henry (2004) argued that firm level data provide a sufficient degree of freedom to disentangle the contribution of changes in the risk free rate from changes in risk sharing following the stock market liberalization. According to Chari and Henry (2005), the stock market liberalization affects the cost of capital through two channels: the risk free rate and the firm-specific beta effect. The stock market liberalization results in a fall in risk free rate as the country moves from financial autarky to integration with the world market. The common shock to the cost of capital as shown by a reduction in the risk free rate will

increase the average investment rate of the firms (Chari and Henry 2005). Through the beta effect, the stock market liberalization change the relevant benchmark for pricing the risk of individual stocks from local stock market index to a world market index (Chari and Henry 2005). Consequently, the equity-risk premium falls, the expected return falls and the stock price increases. This is the prediction of the International Asset Pricing Model. In addition, as the equity premium falls following the liberalization for firms whose returns are less correlated with the world market than they are with the local market, this implies the firms whose equity-risk premiums fall should invest more than those whose risk premium rises (Chari and Henry 2005). Therefore, the stock market liberalization should result in an increase in firm share price and investment rate.
The studies of the effects of stock market liberalization are organized into four areas: the revaluation effect of stock market liberalization; the effect of stock market liberalization on cost of capital, investment and Tobin's Q; the effect of stock market liberalization on stock market liquidity and efficiency; and the effect of stock market liberalization at firm level.

A. Studies on the Revaluation Effect of Stock Market Liberalization

It is argued that liberalizing a country's stock market changes the relevant sources of systematic risk for pricing stocks from the local stock market index to the world market index (Chari and Henry, 2005). Consequently, the expected return should change when a country liberalizes. Much of the literature shows that the stock market liberalization leads to an increase in return or stock prices during the liberalization period (Henry, 2000b and Bakaert and Harvey, 2000). Henry (2000b) used the International

Asset Pricing model (IAPMs) to predict the behavior of stock price following the stock market liberalization. He argued that the IAPM predicts that the stock market liberalization will reduce the liberalizing country's cost of capital by allowing risk sharing between foreign and domestic agents. He argued that following the stock market liberalization, the emerging country's stock market becomes fully integrated, the equity premium will be proportional to the covariance of the country's aggregate cash flows and the world market portfolio (Henry, 2000b). He argued that in mild segmentation case in which the country is constrained by the foreign ownership limit restriction, the equity premium will lie somewhere between the autarky and a fully integrated premium (Henry, 2000b). In addition, he argued that once the market is integrated following the stock market liberalization, in both complete and mild segmentation cases, the equity premium is expected to fall because risk is diversified (Henry, 2000b). When the equity premium falls, the cost of capital will also fall. Therefore, he further argued that if stock market liberalization reduces the aggregate cost of capital, holding the expected cash flows constant, the country's equity price index should increase when the stock market liberalization occurs. Henry's (2000b) sample consisted of data from 12 emerging countries: Argentina, Brazil, Chile, Colombia, India, Korea, Malaysia, Mexico, The Philippines, Taiwan, Thailand, and Venezuela. He models stock return as a function of stock market liberalization. In addition, he used the world stock return variable, a concurrent economic reform variable, and macroeconomic fundamental variables in separate equations as the explanatory variables. He also tested whether revaluation occurs in anticipation of subsequent stock market liberalization. He used an event study approach to assess whether the stock market liberalization is associated with the

evaluation of the stock price. Using an event study, he found that the stock market return increases after liberalization has taken place in all five of his models. His liberalization dummy variable represents the event window of the first stock market liberalization that begins seven months prior to the implementation month and ends in the implementation month. In his sample of 12 emerging countries, he finds that the stock market experiences average abnormal returns of 4.7 percent per month in real dollar terms during the eight-month window leading to the stock market liberalization. After he controlled for the co-movements in the world stock markets, economic policy reforms, and the average abnormal returns, he found that the abnormal return is around 3.3 percent per month. In addition, he found that the largest abnormal return that he could estimate is 6.5 percent for the month in which the liberalization takes place when he changed the liberalization dummy variable to cover four months prior to the implementation month and ends in the implementation month. His findings were consistent with the International Asset Pricing model.

Kim and Singal (2000) found the effect of stock market liberalization by computing and comparing stock returns before market opening with the stock returns following the market opening. Their database contained a monthly total return index for 19 countries, based on a representative set of stocks followed by the IFC and adjusts for all distributions and stock splits. The 10-year period of study included 5 years before market opening and 5 years after market opening. Their unit of measurement was in dollar terms. They computed the mean and standard deviation of returns prior to market opening, and after market opening and the change in return rate. They used parametric tests to give the estimate of the size of the average effect of market openings on changes

in stock returns. They also used nonparametric tests to determine whether the percentage of post-opening returns is significantly greater than the pre-opening returns by 50 percent. In their study, they found that the stock return increases soon after the opening of markets and is followed by a subsequent reduction in returns that is sometimes significant. They argued that an increase in returns probably reflects an increase in stock prices due to additional demand by foreign investors. They argued that once the stock price adjusts to the new information, stock returns fall. The study of Kwan and Reyes (1997) on the price effect of stock market liberalization in Taiwan also showed that Taiwan's stock market liberalization had induced some change in returns distribution and the volatility of stock returns was lower in the post liberalization period.

B. Studies of the Stock Market Liberalization Effect on Cost of Capital, Investment, and Tobin's Q

Besides a revaluation effect, it has been shown that stock market liberalization leads to a decrease in cost of capital (Stulz, 1999; Bekaert and Harvey, 1998; Henry, 2000b; and Henry, 2003). Henry (2000b) uses dividend yield to proxy for the cost of capital. In his paper, he models dividend yield as a function of stock market liberalization. He also controls for world stock return, concurrent economic reforms, and macroeconomic fundamental variables in separate equations. In all of his models, the dividend yield falls after the stock market liberalization. As dividend yield falls after the stock market liberalization, this implies that the cost of capital is reduced. Since the cost of capital is reduced, it is argued that investment will increase (Henry, 2003). Moreover, since the level of investment increases after liberalization, economic growth is expected

to be higher (Bekaert, Harvey, and Lundblad, 2001). Bekaert and Harvey (1998) also found that increases in equity flows after liberalization are associated with the lower cost of capital, higher correlation with world market returns, lower asset concentration, lower inflation, larger market size relative to GDP, more trade, and slightly higher per capita economic growth.

In another study, Henry (2000a) found that stock market liberalization leads to boom in private investment. From a sample of 11 developing countries that liberalized their stock markets, 9 experienced growth rates in private investment above their non-liberalization median in the first year after liberalizing. In the second and third years after liberalization, this number is 10 of 11 and 8 of 11, respectively. The mean growth rate of private investment in the three years immediately following stock market liberalizations exceeded the sample mean by 22 percentage points. Henry also argued that if stock market liberalization reduces a country's aggregate cost of equity capital, it would also cause a temporary increase in the growth rate of investment, via the following mechanism: stock market liberalization will increase stock prices and thereby will increase investment.

Chari and Henry (2005) argued that the stock market liberalization results in a reduction in risk free rate and a change in firm equity-risk premiums. A change in risk premiums is due to liberalization change a relevant benchmark for pricing the risk of individual stocks from the local stock market index to a world market index. Consequently, the equity-risk premium falls for firms whose returns are less correlated with the world market than they are with the local market index. They argued that given the common shock, the firms whose equity risk premium fall should invest more than

those whose equity-risk premium rises. They also argued that the reform induces change in expected future earnings that might also drive a change in post liberalization investment. They use open-economy model of Tobin's Q to decompose change in post-liberalization investment into changes in future earning, the change in risk free rate, and changes in equity-risk premium. They use International Finance Corporate Finance database to construct a firm level dataset of 369 firms in India, Jordan, Korea, Malaysia, and Thailand from 1980 to 1994. They use firms that listed in the stock exchange market. They found that average firm experiences a 46.1% jump in Tobin's Q during liberalization. They found that in the three year period following the stock market liberalization, the growth rate of the typical firm's capital stock exceed its pre-liberalization mean by an average of 5.4% point. In addition, their panel data estimation results show that a 1% point increase in the firm's expected future earning results in a 2.9 to 4.1% point increase in growth rate of firm capital stock. The common shock to the firm's cost of capital generates a 2.3% point per year increase in investment. The changes in firm equity-risk premiums, however, are statistically insignificant in every specification. In other words, the firm-specific changes in risk premium do not affect the investment rate.

C. Studies on the Effect of Stock Market Liberalization on Stock Market Liquidity and Efficiency

In addition to increases in stock prices, lower cost of capital and higher levels of investment, many studies have shown that stock market liberalization increases stock market liquidity (Levine and Zervos, 1998; Chandra, 2002; and Patro and Wald, 2002).

Levine and Zervos (1998) found that the stock markets tend to become larger, more liquid, more volatile, and more integrated following the liberalization. Levine (1997) argued that stock market liquidity is a robust predictor of long-run real per capital GDP growth. He also argued that lowering international investment barriers significantly enhances the liquidity of stock markets, with positive effects on economic growth; therefore, there is a strong connection between liquidity and economic growth. In another paper, Levine (2001) argued that liquid equity markets make long-term investment more attractive because they allow investors to buy and sell quickly. He argued that by facilitating long-term investment, liquid markets improve the allocation of capital and thereby boost productivity growth (Levine, 2001). He used the value traded ratio, which equals the value of shares traded on the stock market exchange divided by GDP to measure the stock market liquidity. Then he used an event study method to examine the behavior of stock market liquidity before and after a change in liberalization policy in 15 countries. His results indicated that liquidity tends to rise following liberalization. He found that 14 out of 15 countries exhibited strong evidence of greater stock market liquidity after liberalization. He concluded that his results are consistent with the view that international capital flow liberalization may be a useful policy tool for countries seeking to boost stock market development.

It has been shown that the stock market becomes more efficient after liberalization (Chandra, 2002). Chandra (2002) linked the liquidity level to the efficiency of the market. It was argued in that study that stock market liberalization leads to enhance liquidity, after controlling for size and other relevant factors, and that an increase in liquidity will lead to a decrease in market inefficiency (Chandra, 2002). In addition to

using the liquidity level to measure market efficiency, Kim and Singal (2000) also used the random walk hypothesis to capture market efficiency. In their paper, they used variance ratio tests to test the random walk hypothesis. They examined whether the stock returns become more random when there was stock market liberalization and argued that randomness is related to market efficiency. They found that the tests of the random walk hypothesis show that stock returns are less predictable over the longer horizon. To the extent that less predictability in stock prices reflects greater stock market efficiency, open markets should result in a more efficient allocation of capital (Kim and Singal, 2000).

In order to assess whether liberalization induces inefficient investment, Chari and Henry (2005) examine post-liberalization rate of return on capital and find that the rate of return on capital increases from an average of 16% per year in the pre-liberalization period to 24.3% in the post liberalization period. This implies that investment following liberalization is not wasteful.

D. Other Studies of Stock Market Liberalization at Firm Level

Although most studies have been done at the aggregate or country level, some studies have been done at the firm level as well. It has been shown that stock market liberalization increases risk sharing and thereby reduces the systematic risk associated with holding investible securities (Chari and Henry, 2004). In addition, it is argued that liberalization will affect the revaluation of stock price through the size of individual firms. Larger firms tend to exhibit large revaluation effects, insignificant changes in performance, large declines in volatility, and insignificant changes in correlation from liberalization. Small firms show small revaluation effects, improved performance,

smaller declines in volatility, and decreases in correlation after liberalization (Christoffersen, Chung, and Erunza, 2002).

Patro and Wald (2002) used firm level analysis on the impact of capital market liberalization in 18 emerging markets. They found an increase in return in during liberalization and post liberalization compared to the pre-liberalization period. In after liberalization period, the return was positive but significantly lower than in the pre-liberalization period. They also found that liberalization lowers firm cost of equity as predicted by the International Asset Pricing model. The International Asset Pricing model under capital market segmentation predicts that as capital markets become integrated, the cost of capital will decline as risk is internationally diversified. Using dividend yield to proxy for cost of capital, they found that dividend yield fell by 44 basis points on average from the pre-liberalization to the during liberalization period, by 204 points from the pre-liberalization period to the post period, and by 143 basis points form the pre liberalization period to the after liberalization period. In addition, they also found that during liberalization, smaller firms, high book to market value firms, low local beta firms, low foreign exchange beta firms, and non-manufacturing firms had increased returns. Also, they found that after liberalization, firms with higher local market betas, and firms with lower foreign exchange betas had decreased returns.

E. Summary

In conclusion, stock market liberalization induces an increase in the stock price and stock return around the liberalization period. Previous studies show that the stock return increases following liberalization and declines over time. Previous studies also

show that the cost of capital declines following stock market liberalization thereby inducing an increase in investment. Chari and Henry (2005) also finds that Tobin's Q and firm investment also increase following stock market liberalization. Besides increases in stock prices, lower cost of capital, higher level of investment and higher Tobin's Q, many studies have shown that the stock market liberalization increases stock market liquidity. In addition, previous studies also show that the stock market becomes more efficient following liberalization. The study of the effect of stock market liberalization using firm level data also shows the same result; that is, stock market liberalization induces an increase in a firm's stock return, reduces the cost of capital, and increases investment following the liberalization.

CHAPTER III

HISTORY OF THE STOCK EXCHANGE OF THAILAND, LIBERALIZATION, AND THE POLICIES TO PROMOTE FOREIGN INVESTMENT

A. The Stock Exchange of Thailand

The capitalization and level of trading activity in the Thai market exceeds some smaller developed countries and all but the largest emerging markets (Bailey and Jagtiani, 1994). Legislation establishing the Securities Exchange of Thailand (SET) was formally enacted in 1974. The Securities Exchange of Thailand officially started trading on April 30, 1975. On January 1, 1991, the Securities Exchange of Thailand officially changed its name to the Stock Exchange of Thailand (SET). The SET's primary roles are:

1) To serve as a center for the trading of listed securities and to provide the essential system needed to facilitate securities trading.

2) To undertake any business relating to the securities exchange, such as a clearing house, securities depository center, securities registrar, or similar activities.

3) To undertake any other business approved by the Securities Exchange Commission (SEC).

In 1992, there were several developments in the Thai capital markets. The new Securities and Exchange Act was enacted, while a governing body, the Securities and

Exchange Commission (SEC)[1] was established. Under the SEC Act, an issuer of shares and equity-related securities is restricted to a public limited company, while an issuer of debt instruments can be either public limited company or a limited company. The difference between the public limited company and limited company is that the public limited company is the company listed on the SET, while a limited company is not listed on the SET. In order for a company to issue shares in the SET, the company has to be a public limited company. Issuers have to disclose reliable and adequate information to provide greater investor protection. Different types of securities businesses require different licenses. These include securities brokerage, securities dealing, investment advisory services, securities underwriting, mutual fund management, and private fund management.

The SEC Act encourages further development of both primary and secondary markets for debt and stock instruments, e.g., warrants, mutual funds, and convertible debentures. These changes represent a major innovation, since the previous rules and regulations were either too stringent or too intricate. In addition, various regulators or supervisors were unified into a single unit, or SEC, which not only screens and approves stock and debt issuance but also oversees the SET's pattern of trading.

[1] The SEC Act also provides for setting up an over-the counter (OTC) center to facilitate the trading of unlisted securities. Ordinarily, public offering of securities must be processed through SEC. If the securities cannot be listed in SET, they can be traded OTC. SEC retains the power to investigate all unfair securities trading practices and to impose appropriate penalties (Data source: TDRI Quarterly Review, Vol. 10, No. 1 March 1995, pp. 8-11).

B. The Liberalization of the Stock Market

During the early 1980s, financial liberalization received little attention from Thai authorities, who until that time, gave top priority to resolving fundamental macroeconomic and microeconomic problems. When the time was right, Thailand began to experience rapid economic expansion and to have surpluses in the fiscal balance and the balance of payments. Therefore, increasing the competitiveness of domestic financial institutions and restructuring financial systems became a priority.

To cope with high market fluctuations and rapid economic expansion, Thailand began to implement financial liberalization policies. In 1985, a number of policies were implemented. These included the easing of exchange controls, the liberalization of interest rates, various policies to promote foreign investment, and a larger scope for the operation of financial institutions. Various policies were also implemented to promote foreign investment in the stock market. For example; the appearance of the Bangkok Fund Ltd at the London Stock Exchange in 1985, allowing foreign investors to repatriate their invested funds at any time after being confirmed by member firms of the SET, a decrease in the income tax rate for foreign investors in the on-shore foreign investment fund in 1986, a launching of a special board for trading securities by foreigners called the "Alien Board" in 1987, allowing outward remittances of dividends foreign investors received from Thai companies if they had already submitted relevant documents in 1989, and relaxing foreign exchange controls in 1990, and introduction of the first ADRs in 1991. Moreover, the basic financial infrastructure was renovated in several aspects. The Bank of International Settlements' guidelines on capital adequacy were adopted, and the

Bangkok International Banking Facilities[2] (BIBF) was initiated. The following agencies were also established: The Securities Exchange Commission, more mutual fund companies, a credit rating agency, and the Export-Import Bank.

C. Policies to Promote and Facilitate Foreign Investment and Liberalization Dates

The capital account liberalization was normally characterized: first, reforming the banking sector with the deregulation of domestic interest rates; secondly, by the opening of the capital account in varying degrees; and thirdly, by beginning the dismantling of restrictive measures on domestic equity markets, as well as those on foreign ownership of financial assets, (Das, 2003). As this dissertation studies the effect of stock market liberalization on stock return, investment/cost of capital, and performance of the firms listed in the SET, its main focus is on the liberalization policies that promote and facilitate foreign investment in the stock market. The liberalization policies were obtained from the SET Fact book and the SET Annual Report. In addition, I use Henry's (1999) chronological listing of major policy events in developing countries to identify liberalization policies that helped promote foreign investment in certain years. In addition, Henry's (2000b) paper identified the official stock market liberalization date of

[2] The BIBF was established in March 1993 to facilitate the growth of international banking business in Thailand. The main operation of BIBF banks on the liability side is deposits or borrowing in foreign exchange from abroad, mainly through foreign inter-bank transaction and inter-office borrowings. On the asset side, their main activities are lending in foreign currency to Thai residents (out-in) and non-residents (out-out). To the extend that the BIBF out-in lending to Thai firms is replacing other sources of short and long term foreign capital, the maturity structure of Thailand external debt will shorten since most BIBF funding is short-term. And by reducing borrowing costs and indirectly easing access to foreign capital market for smaller and less well-known Thai firms, the establishment of the BIBF may have increased the magnitude of short-term capital flows. In addition, the BIBF also benefited from several important tax advantages. BIBF banks are treated as residents by the Bank of Thailand for purposes of the BOP. Therefore, BIBF funding activities are counted as capital inflows under the BOP. (Data Source: Alba, Hernandez, and Klingebile, Financial Liberalization and the Capital Account: Thailand 1988-1997, World Bank and Central Bank of Chile).

Thailand. Table 1 shows Thailand's official liberalization dates and various policies to promote and facilitate foreign investment. From Table 1, the years 1985 and 1987 are chosen to be the stock market liberalization years in this study since significant liberalization events occur in those years. In 1985, the Bangkok Fund Ltd. was launched for the first time on the London Stock Exchange with net asset value of $163.5 million. According to Bakaert and Harvey (2000), a closed-end country fund is the investment company that invests in a portfolio of assets in a foreign country and issues a fixed number of shares domestically, and each fund provides two different market prices: the country fund share price quoted on the market where it trades, while its net asset value is determined by the price of the underlying shares traded on the foreign market. They argued that the close-end mutual funds were the original channel for foreign investment in emerging financial markets (Bakaert and Harvey, 2000). Errunza, Senbet, and Hogan (1998) showed that the introduction of country funds increased the local companies' price and reduced the cost of capital. They argued that the introduction of the country fund integrated the local market to the global market (Errunza, Senbet, and Hogan, 1998). In 1987, the Alien board was inaugurated in addition to the Main board in the Stock Exchange of Thailand to facilitate foreign investment. The inauguration of the Alien board was to promote foreign investment in the Thailand. Therefore, the introduction of the first Thailand fund and the establishment of the Alien board are considered the major liberalization events. Since the Alien board share prices started to appear on the Alien board in 1988, 1991 is the additional liberalization year that is considered when evaluating the revaluation effects. In 1991, there were various policies to promote foreign investment such as partially removing controls and reporting requirements for the

repatriation of dividends capital gains, foreign currencies, and share certificates. In addition, the first ADR was announced and became effective on that year. The first ADR is considered another liberalization policy according to Stulz (1999), who argues that if none of the firms in a country has access to international capital markets, the announcement of the ADR program by a firm in the country is evidence of the liberalization of the capital market of that country.

CHAPTER IV

METHODOLOGICAL ISSUES AND DATA

This study examines the effect of stock market liberalization on stock return, investment, and the performance of Thai firms. It tries to find the effects in the pre, during, post, and after stock market liberalization periods on firm stock return, investment/ cost of capital, and performance. The effect of liberalization on a firm stock return is separated into two effects: Main board effect and Alien board effect. In 1987, the SET promoted greater foreign investment by launching the Alien board in addition to the Main board to facilitate foreign investment. Prior to the establishment of the Alien board, foreign investors had to wait indefinitely for the foreign ownership limits set by the Thai authority to be loosened when other foreigners sold shares in order for them to submit buying orders. Since the establishment of the Alien board, for companies that reach the foreign ownership limit, Thais continue to trade shares on the Main board while foreigners submit orders to the Alien board. Alien board shares and Main board shares are identical in all respects such as dividends and voting rights. However, the share prices on the Alien board are generally higher than on the Main board due to higher demand and the foreign ownership limit constraint. Therefore, the revaluation effects are separated into the Main board effect and the Alien board effect.

Annual firm level data is used in this study. According to Patro and Wald (2002), using firm level data allows researchers to examine the breadth of liberalization. The

study is divided into three main sections. The first section looks at the effect of the stock market liberalization on firm stock return. The second section studies the effect of stock market liberalization on firm investment rate and firm cost of capital. The third section studies the effect of stock market liberalization on firm performance.

In order to determine the stock market liberalization process, I employ the SET's policy to promote and facilitate foreign investment. I treat the SET policies to promote foreign investment as the indicator of stock market liberalization. Allowing foreign investment in a domestic stock market can be viewed as a removal of or reduction in constraints (Kim and Singal, 2000). Opening the market represents an important opportunity to attract foreign capital to finance economic growth (Kim and Singal, 2000).

As indicated in Table 1, stock market liberalization is a gradual process. Any policy changes that occur during the liberalization may affect the market. Dummy variables are used to capture the effect of stock market liberalization in years that had significant policy changes that facilitated foreign investment. The first liberalization year is 1985, when the Bangkok Fund was first officially launched on the London Stock Exchange with a net asset value of $163 million. The second liberalization year is 1987, when the Alien board, the special board for trading securities held by foreigners, was launched. After 1989, various significant policies were announced to promote and facilitate foreign investment. Since January 1990, the SET Board of Directors has allowed quoted and pre-quoted companies offering their shares to the public to adopt a dual price policy through which their share price might be fixed at two levels for sales to foreign and to local investors. This regulation enables companies to earn more premiums by selling their shares in foreign markets. Normally, foreigners would buy shares

through the Alien board. Second, in May 1990, the BOT and the Ministry of Finance announced new measures to liberalize the financial system. These measures dismantled restrictions on current international payments to avoid discrimination in currency practices to other members of the IMF and to apply only one exchange rate for international business, and facilitated foreign exchange settlements by relaxing foreign exchange controls. The controls and reporting requirements for the repatriation of dividends, capital gains, foreign currencies, and share certificates were partially removed in 1991. In addition, the first ADR was introduced in 1991; therefore, 1991 is my additional liberalization year when evaluating the revaluation effect of the firm Alien board stock return. Stulz (1999) argued that the ADR initiation in a country can be viewed as a liberalization event and that as a country undertakes the ADR program, the cost of capital in the country can be affected, since the ADR program is evidence of liberalization. Since the introduction of the ADR affects the cost of capital, it will certainly affect the revaluation effect on firm stock return.

Before estimating the model, I conducted a test to identify whether a heteroskedastic problem exists. Then I estimated the model by the ordinary least squares, fixed effect estimation method, and panel-generalized least squares. In estimating the model, I first control for firm differences and then for sector differences. I used the Hausman Specification test to pick the best estimation method to interpret the results.

A. Data to Conduct the Study

Panel annual firm level data are used in this study. The data are collected annually from 1976 to 2003. Since Thailand experienced a financial crisis in 1997, a

dummy variable for 1997 is included in the estimation model to account for the structural break. Some early year data are collected manually because most of the data before 1992 are available only in print. Firm level data from 1976 to 1996 are collected from the Stock Exchange of Thailand Company Profiles. Annual firm level data from 1997 to 2003 are collected from the Global Vantage database. In addition to using the chronological listing of major policy events in developing countries of Henry (1999), I also used the Securities Exchange of Thailand annual reports from 1976 to 2003 and the Securities Exchange of Thailand Fact Book from 1976 to 2003 to identify financial and economic developments that significantly affected liberalization. The Main board share prices are obtained from the Stock Exchange Company Profiles and the Global Vantage database. The Alien board share prices are obtained from the Securities Exchange of Thailand Fact Book. The Main board share prices and Alien board share prices are year-end prices. Although the Alien board was inaugurated in 1987, share prices were shown in the Securities Exchange of Thailand Fact Book after 1987. The unit of measurement for a firm Main board share price (P), firm Alien board share price (P_AB), and earning per share (EPS) variables is the baht. The measurements for sales (SALES), net income (NI), property plant and equipment (PPE), market capitalization (MKTCAP), total liabilities (TOTAL_LIA), total equity (TOTAL_EQ), and total asset (TA) are in thousand baht. The unit of measurement for the Alien board number of shares (AB_NS) and Main board number of shares (NS) is in thousand units. Table 2 summarizes the statistics for the complete dataset from 1976 to 2003 used in this study. The total number of observations is 10,778 with large gap due to missing data. The total number of observations is different between variables. The total number of firms used in this study

is 469, in 31 sectors, listed in the Stock Exchange of Thailand. Four main datasets are used to conduct the estimation. The first dataset is the whole sample dataset, which is the original dataset. The second dataset contains only the firms that have observations before and after 1985. The total number of firms and sectors in the second dataset is 104 firms, in 19 sectors respectively. The third dataset contains only the firms that have observation before and after 1987. The total numbers of firms and sectors are 116 firms, in 22 sectors respectively. The fourth dataset contains only the firms that have observation before and after 1991. The numbers of firms and sectors in the forth dataset is 276 firms, in 30 sectors respectively. Table 3, 5, and 6 summarize data in the second, third, and fourth dataset. In estimating the model, the whole sample dataset is used and the sub sample datasets are used to estimate the same model to determine whether the estimation results are different when the sample size is smaller. The criteria for choosing the sub sample dataset depend on the chosen liberalization year.

B. Methodology

B.1. The Effect of Stock Market Liberalization on the Firm Stock Return

Many studies of stock market liberalization have shown that liberalization leads to increases in stock return during the liberalization period. Henry (2000b) found that the stock market return increases after liberalization has taken place. Henry (2000b) used the Standard International Asset Pricing Models (IAPMs) to predict the behavior of stock prices after liberalization. According to IAPMs, the country's aggregate cost of equity capital falls when it opens its stock market to foreign investors. Equivalently stated,

holding expected future cash flows constant, we should see an increase in an emerging country's equity price index when the market learns of impending stock market liberalization (Henry, 2000b).

Therefore, in order to test the effect of stock market liberalization on stock return, I developed a model to find the effect of stock market liberalization in periods before, during, post, and after the liberalization. The main focus is on the during and post-liberalization effects. In the previous studies by Chari and Henry (2004), Patro and Wald (2002), and Fuchs-Schundeln and Funk (2001), stock return is modeled as a function of liquidity and firm size, firm size and market to book ratio, firm size, and liberalization variables respectively. I use the number of shares outstanding to proxy for liquidity, the log of sales to capture the firm's size (Himmelberg, Hubbard, and Palia, 1999), and the market to book ratio to capture the growth rate of the firm (Varaiya, Kerin, and Weeks, 1987). I expect the stock return to increase during the liberalization period and fall after the liberalization period.

According to investment theories, in a segmented market, the market portfolio of securities is priced according to the home market index (Chan and Yu, 2003). However, when the market is liberalized, the market portfolio of securities is priced according to the world index, and the securities will be revalued according to the world market price of risk (Chan and Yu, 2003). According to Stulz (1999), stock market liberalization results in risk sharing between domestic and foreign investors. Chari and Henry (2004), started with the Capital Asset Pricing Model (CAPM). They first assumed a small country whose equity market is completely segmented from world equity markets. They also assume that all investors in the world are risk averse and care only about the

expected return and variance of their investment. They argue that since domestic investors care only about the expected return and volatility of their portfolio, it follows that CAPM will hold. Therefore, before stock market liberalization, the expected return will be in the following form:

$$E[R_i] = r_f + \beta_{im}(E[R_m] - r_f) \quad (1)$$

Where $E[R_i]$ = required rate of return on firm i's stock
r_f = risk free rate in domestic market
β_{im} = beta coefficients of firm i with the domestic market portfolio before liberalization
$E[R_m]$ = the expected return on domestic market.
$(E[R_m] - r_f)$ = aggregate risk premium on small country's equity market before stock market liberalization.

Following Chari and Henry (2004), it can be rewritten as $\gamma(W)\sigma^2_m$ where $\gamma(W)$ is the coefficient of risk aversion and σ^2_m is the variance of return on the small country's market portfolio. Chari and Henry (2004) assume that all investors have constant relative risk aversion so that $\gamma(W) = \gamma$. Therefore, the equation will be rewritten as:

$$E[R_i] = r_f + \beta_{im}\gamma\sigma^2_m \quad (2)$$

Where $\beta_{im}\gamma\sigma^2_m$ = risk premium before liberalization and $\beta_{im} = \frac{COV(R_i, R_m)}{\sigma^2_m}$

After the country liberalizes its stock market, the expected return on domestic stock will change. I assumed a mild segmentation case. Under mild segmentation, foreign investors can invest domestically but can hold only a subset of domestic securities. I assume a mild segmentation case because Thailand still imposes restrictions on foreign ownership limit. Foreigners are generally limited to a maximum of 49 percent ownership in a Thai firm. Chari and Henry (2004) assume that the expected value and variance of the profits from domestic production activities are unaltered by liberalization. When the country liberalizes, the relevant source of systematic risk

becomes the world market. According to Chari and Henry (2004), the required rate of return after liberalization will be as follows:

$$E[R_i^*] = r_f^* + \beta_{iw} (E[R_w] - r_f^*) \quad (3)$$

Where $E[R_i^*]$ = the required rate of return on firm i in the integrated capital market equilibrium
β_{iw} = firm i's beta with the world market
$E[R_w]$ = the required rate of return on the world equity market portfolio
r_f^* = world risk free rate

$(E[R_w] - r_f^*)$ = the aggregate risk premium on the world market portfolio. It can be rewritten as $\gamma\sigma^2_w$ where σ^2_w = variance of the return on the world portfolio. According to Chari and Henry (2004), the required rate of return on firm i's after liberalization is as follows:

$$E[R_i^*] = r_f^* + \beta_{iw}\gamma\sigma^2_w \quad (4)$$

Where $\beta_{iw}\gamma\sigma^2_w$ = risk premium after liberalization and $\beta_{iw} = \frac{COV(R_i, R_w)}{\sigma^2_w}$

Therefore, stock market liberalization affects a firm's required rate of return. Chari and Henry (2004) specify another variable, DIFCOV, which is the historical covariance of a firm stock return with the local market index, minus the historical covariance of the firm stock return with the world market index:

$$DIFCOV = \beta_{im}\gamma\sigma^2_m - \beta_{iw}\gamma\sigma^2_w \quad (5)$$

$$= \frac{COV(R_i, R_m)}{\sigma^2_m}\gamma\sigma^2_m - \frac{COV(R_i, R_w)}{\sigma^2_w}\gamma\sigma^2_w$$

$$= \gamma\, COV(R_i, R_m) - \gamma\, COV(R_i, R_w) \quad (6)$$

Assume that all investors in the world are risk averse and care only about the expected return and variance of their investment.

$$DIFCOV = \gamma [COV(R_i, R_m) - COV(R_i, R_w)] \quad (7)$$

According to Chari and Henry (2004), the historical covariance of the average investible firm stock return with the local market index is roughly 200 times larger than its historical covariance with the world market index; therefore, liberalization reduces the systematic risk associated with holding investible securities. In other words, they found that systematic risk declines after liberalization. That is $\beta_{im}\gamma\sigma^2{}_m$ is greater than $\beta_{iw}\gamma\sigma^2{}_w$. Because international diversification reduces risk, investors are willing to accept lower returns on their investments after market liberalization (Chan and Yu, 2003). Patro and Wald (2002) argued that a reduction in expected return would cause a securities price to rise. Thus, I expect a short-term surge in stock return around a market liberalization announcement, but a long-term reduction in market returns because risk sharing occurs after liberalization (Chan and Yu, 2003). As stated above, Chari and Henry (2004) specify the variable DIFCOV as the difference between the covariance of a firm stock return with the local market index and the covariance of the firm stock return with the world market index. They found a positive statistic relationship between firm stock price and DIFCOV variable. Therefore, a long term reduction in market returns may be a result of a reduction in the DIFCOV variable over time. Patro and Wald (2002) found of a short-term surge in stock return around market liberalization and a long-term reduction in returns after the stock market liberalization. They found an increase in returns during the liberalization period; that is, the return is higher than in the pre-liberalization period. They also found a higher return in the post-liberalization period than in the pre-liberalization period and a positive return in the after period although the return is significantly lower than in the pre-liberalization period.

Chan and Yu (2003) also mentioned the International Asset Pricing Model under market segmentation. The International Asset Pricing Model theory predicts that a country's aggregate cost of equity capital will fall upon the opening of its stock market to foreign investors. The model implies that market returns will be higher during the liberalization event shortly before and after the announcement and lower in the long- run. I expect to see a surge in stock return in the pre-liberalization period since according to the International Asset Pricing model, the cost of capital fall upon the opening of the stock market due to a reduction in the risk premium**.** As the cost of the capital fall, the expected return falls and the stock price is expected to rise. Therefore, I expect a short-term surge in stock price due to the cost of capital is expected to falls following the stock market liberalization. I calculated the covariance of firm stock return with the local market index and the covariance of the firm stock return with the world market index for all years before and all years after the stock market liberalization. If the covariance of firm stock return with the local market index is higher than the covariance of firm stock return with the world market index, this implies that the risk premium falls. When the risk premium falls, the expected return falls, thereby causing the security price to increase. Therefore, if the International Asset Pricing Model prediction is true, I expect firm stock price to increase when the covariance of the firm stock return with the local market index is higher than covariance of the firm stock return with world market index following the liberalization.

B.1.1. The Pre, During, Post and After Effects of Stock Market Liberalization on Firm Main Board Stock Return

To determine the liberalization effect on firm Main board stock return, I first conducted a t-test to identify whether there is a significant change in the firm Main board stock return under four main scenarios: all years before and all years after liberalization, five years before and five years after liberalization, three years before and three years after liberalization, and one year before and one year after liberalization. To identify the effect of stock market liberalization on firm Main board stock return, I estimated how the liberalization would affect the firm Main board stock return in the during, post, and after the year that had significant changes in SET's policies to promote foreign investment. In other words, I tried to find any revaluation effects in 1985 and 1987 liberalization for the firm Main board stock return and find any revaluation effects in the 1991 liberalization for the firm Alien board stock return. I started with the Main board stock return. The model is as follows:

$$RETURN_{it} = \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \Theta_5 LIBAF + \Theta_6 D97 + Firm_i + e_{m\,it} \quad (8a)$$

$$RETURN_{it} = \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \Theta_5 LIBAF + \Theta_6 D97 + Sector_i + e_{m\,it} \quad (8b)$$

where

Firm	=firm specific fixed effect dummies
Sector	=sector specific fixed effect dummies
$RETURN_{it}$	= firm Main board stock return. It is the log of firm Main board share price for period t (lnp_{mit}) minus log of firm Main board share price for the period of t-1 (lnp_{mit-1}).
PRELIB	= 1 one and two years before liberalization and 0 otherwise. This dummy variable is used to capture right before liberalization effect.
LIB0	= 1 in the year of liberalization and zero otherwise.
POSTLIB	= 1 one and two years after liberalization and 0 otherwise. This dummy variable is used to capture post-liberalization effect

LIBAF	= 1 in three, four, and five years after liberalization years and 0 otherwise. This dummy variable is used to capture after liberalization effect
D97	= Dummy variable for year 1997 to account for the Asian financial crisis

$Return_{it}$ is the firm Main board stock return calculated as the log of firm Main board share price in period t minus the log of share price in period t-1. The subscript "m" refers to the Main board stock return. The subscript "i" refers to the firm and subscript "t" denotes the time period. Using panel data allows me to include cross sectional fixed effects ($Firm_i$ and $\boldsymbol{Sector_i}$) and thus to mitigate any potential omitted variable bias (Fuchs-Schundeln and Funke, 2001). In order to find out the pre, during, post, and after effects of stock market liberalization on stock return, I followed Fuchs-Schundeln and Funke (2001) by using the liberalization dummy variables, PRELIB, LIB0, POSTLIB, and LIBAF. PRELIB takes value of 1 in one and two years before the liberalization years and 0 otherwise. LIB0 takes value of 1 in the year that liberalization takes place and 0 otherwise to capture the during-liberalization effect. POSTLIB takes value of 1 in one and two years after liberalization and 0 otherwise to capture the post-liberalization effect. LIBAF takes value of 1 in three, four, and five years after liberalization year and 0 otherwise to capture the after-liberalization effect. This model is estimated using years 1985 and 1987 respectively one at a time as the LIB0 variable, which is the year of stock market liberalization.

Then I add the control variables to equation (8) to see whether the revaluation effects are different when control variables are included.

$$\boldsymbol{RETURN_{it}=\gamma_{1m}LNSL_{m\,it}+\gamma_{2\,m}MB_{mit-1}+\gamma_{3m}LNNS_{mit-1}+\gamma_{4m}WRETURN_{m\,it}+\theta_1 PRELIB} \\ \boldsymbol{+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Firm_i+e_{m\,it}} \qquad \boldsymbol{(9a)}$$

$$RETURN_{it} = \gamma_{1m} LNSL_{m\,it} + \gamma_{2m} MB_{mit-1} + \gamma_{3m} LNNS_{mit-1} + \gamma_{4m} WRETURN_{m\,it} + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Sector_i + e_{m\,it} \quad (9b)$$

Where LNSL = log of firm sales (to capture size of the firms)
MB = Firm market to book ratio from Alien board (to capture growth of firms)
LNNS = log of number of shares traded from Alien board (to capture liquidity)
WRETURN = log of world market return

The control variables are firm size, firm growth rate, firm liquidity, and world market return. The log of firm sales (LNSL) is used as a proxy for firm size. Market to book ratio (MB) is used as a proxy for firm growth rate. Log of number of shares available to be traded (LNNS) is used as a proxy for firm stock liquidity. Lag value of firm market to book ratio (MB_{mit-1}) and firm number of share traded ($LNNS_{mit-1}$) are used as controlled variable instead of the current value. Christoffersen, Chung, and Erruza (2002) also include the log of world market return in their revaluation effect model as another control variable to see whether the world stock return is significantly related to the firm stock return. World stock return is calculated as the log of world stock index in the current period minus the log of world stock index in the last period. In addition, following the work of Christoffersen, Chung, and Erruza (2002), I include the interaction of the liberalization dummy variables with the firm size variable (LNSL) to see the effect of firm size on firm stock return in the during, post, and after-liberalization periods in addition to the overall effect of firm size on the firm Main board stock return. If the coefficients of the interaction variables are statistically significant, this implies that the revaluation effect depends on firm size.

Formulating the model in this way allows me to see how the firm Main board stock return reacts to significant changes in policies in that period. Kim and Singal

(2000) found that stock return increases soon after the opening of the market and is followed by subsequent reductions in returns that are sometime significant. Patro and Wald (2002) also found a larger increase in returns during liberalization and a large decrease in returns after liberalization. Therefore, using the pre-liberalization period as the base year, I expect the coefficients of the during-liberalization variable (LIB0) and the post-liberalization variable (POSTLIB) to be positive and higher than the PRELIB variable. Patro and Wald (2002) also found positive but significantly lower returns in the after-liberalization period than in the pre-liberalization period. Therefore, I expect the positive stock returns following the stock market liberalization to be less than the pre-liberalization level in the after-liberalization period. The main concentration is on the LIB0 and POSTLIB liberalization dummy variables. Since cross sectional data sometimes is heteroskedastic, I tested for the presence of heteroskedasticity before estimating the model.

B.1.2. The Pre, During, Post, and After Effects of Stock Market Liberalization on Firm Alien Board Stock Return

As mentioned in Table 1, the Alien board was inaugurated in 1987 in addition to the Main Board to facilitate and promote foreign investment. The need for the Alien board arose in the mid 1980s as foreign direct and portfolio investment poured into Thailand. Foreign ownership limits for many Thai firms became binding at that time. In order to submit buy orders, foreign buyers had to wait indefinitely for the ownership limits to loosen when other foreigners sold shares. Foreigners are generally limited to a maximum of 49% ownership in Thai firms, though limits vary across industries and

across firms within an industry. Generally, the maximum foreign share ownership limit is 49% for general companies and 25 % for financial institutions. However, the level can vary with the approval of the Bank of Thailand.[3]

In response, the Stock Exchange of Thailand (SET) inaugurated the Alien board in September 1987. For companies that have reached foreign ownership limits, Thais continue to trade shares on the Main board while foreigners submit orders to the Alien board. Main and Alien board shares are identical in all other respects, such as dividends, voting rights, and procedures for settlement and registration. Foreigners and Thais normally trade the same company's securities on distinct boards at different prices (Baily and Jagtiani, 1994). The Alien board price is generally higher than the Main board price due to higher demand. Baily and Jagtiani (1994) also mentioned that tighter foreign ownership limits a firm and information-rich firms caused the Alien board price to be higher than the Main board price. In other words, they argued that firms with a relatively high weight in foreign investor portfolios but with a tight foreign ownership limit will be in high demand and will exhibit large differences between the Alien and the Main board share prices. Their study found that firms that have a tighter foreign ownership limit are associated with a higher Alien board price premium. They argued that the relative liquidity of the Main board and Alien board shares affects the prices in the Alien board and the Main board. They argued that in the foreigners' view, the Alien board has higher liquidity than the Main board. Their study found that foreign investors offer a relatively high price for relatively liquid Alien board listings, thereby causing the Alien board share price to be higher than the Main board share price. Lastly their study found that the firms

[3] See Baily and Jagtiani (1994) "Foreign ownership restrictions and stock prices in the Thai capital market", Journal of Financial Economics 36 (1994) 57-87.

that are information rich from foreign investors' point of view tend to exhibit large Alien board share price premium. Bailey, Mao, and Sirodom (2004) found that foreign investors have superior information processing ability compared to local investors, a fact which causes a difference in the share price between the Main board and the Alien board. Bailey, Mao, and Sirodom (2004) argued that the gap between price and volume traded between the two boards could increase as cross-market information flows and information processing declines. Since Thai investors normally trade shares through the Main board and foreigners normally trade shares through the Alien board, the price difference between the two boards might be due to the Main board's being populated by poorly informed investors with inferior information processing ability while the unrestricted market is populated by foreign investors who have superior information processing ability (Bailey, Mao, and Sirodom, 2004).

Although normally Thais trade shares on the Main board and foreigners trade shares on the Alien board, Thais can trade shares on both Main and Alien boards, and foreigners can also trade shares on both Main and Alien board. However, if Thais trade shares on the Alien board, they lose all dividends and voting rights. There is no restriction on how long Thais can hold Alien board shares. The only drawback is that during the period that Thais hold Alien board shares, they do not receive any dividends and voting rights. The same consequences hold for foreigners; they are allowed to hold Main board shares but do not receive any voting rights and dividends during the period that they hold Main board shares. There is no restriction on how long foreigners can hold Main board shares. Therefore, if Thais and foreigners want to receive dividends and voting rights, Thais have to hold Main board shares and foreigners have to hold Alien

board shares. Since the Alien board price is generally higher than the Main board price, the shares in the Main board can not be traded for shares in the Alien board. In other words, trading between Alien and Main boards is strictly restricted. Since 1987 when the Alien board was inaugurated, the Alien board price is shown in the SET Fact Book in 1988.

In order to find the stock market liberalization effect on Alien board stock return, I changed the dependent variable to the Alien board stock return instead of the Main board stock return.

$$RETURNPAB_{it} = \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Firm_i + e_{ab\,it} \quad \textit{(11a)}$$

$$RETURNPAB_{it} = \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF\ \Theta_5 D97 + Sector_i + e_{ab\,it} \quad \textit{(11b)}$$

Where	Firm	= firm specific fixed effect dummies
	Sector	= sector specific fixed effect dummies
	$RETURNPAB_{it}$	= firm Alien board stock return. It is log of firm Alien board share price for the period t (lnp_{abit}) minus log of firm Alien board share price for the period of t-1 (lnp_{abit-1}).
	D97	= Dummy variable for year 1997 to account for the event of financial crisis on 1997

Equation (11) is used to capture the direct effect of the stock market liberalization on firm Alien board stock return. $RETURNPAB_{it}$ is the firm Alien board stock return. It is the log of firm Alien board share price for the period t minus the log of firm Alien board share price for the period t-1. The subscript "ab" refers to the Alien board share price. Since the Alien board share price started to appear on the board in 1988, 1991 is the only liberalization year that is used in estimating the effect of the stock market liberalization on the firm Alien board stock return. As in the case of the firm Main board stock return, I expect the firm Alien board stock return to be higher than the pre-

liberalization level in the during and post-liberalization periods but lower than the pre-liberalization level in the after-liberalization period. In order to identify whether the revaluation effects are different when control variables are included, I estimate the following equations.

$$RETURNPAB_{it} = \gamma_{1ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \ominus_5 D97 + Firm_i + e_{ab\,it} \quad (12a)$$

$$RETURNPAB_{it} = \gamma_{1ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \ominus_5 D97 + Sector_i + e_{ab\,it} \quad (12b)$$

Where MB_{abit-1} is the firm Alien board market to book ratio last period and $LNNS_{abit-1}$ is log of firm Alien board number of share traded last period. In order to identify whether a change in firm size affects the firm Alien board stock return in the during, post, and after liberalization periods compared to the pre-liberalization level, I used the following equations.

$$RETURNPAB_{it} = \gamma_{1ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \gamma_{5ab} LNSL_{ab\,it} * PRELIB + \gamma_{6ab} LNSL_{ab\,it} * LIB0 + \gamma_{7ab} LNSL_{ab\,it} * POSTLIB + \gamma_{8ab} LNSL_{ab\,it} * LIBAF + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \ominus_5 D97 + Firm_i + e_{ab\,it} \quad (13a)$$

$$RETURNPAB_{it} = \gamma_{1ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \gamma_{5ab} LNSL_{ab\,it} * PRELIB + \gamma_{6ab} LNSL_{ab\,it} * LIB0 + \gamma_{7ab} LNSL_{ab\,it} * POSTLIB + \gamma_{8ab} LNSL_{ab\,it} * LIBAF + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \ominus_5 D97 + Sector_i + e_{ab\,it} \quad (13b)$$

If the coefficients of the interaction variables are statistically significant, a change in firm size affects the firm Alien board stock return in pre, during, post, and after

liberalization period. I tested for the presence of heteroskedasticity when I estimated the model. I expect the revaluation effect of the firm Alien board stock return to be similar to the firm Main board stock return.

B.1.3. Estimating the Model

I estimated the Main board share price equations and firm Alien board share price equations separately using three estimation methods: 1) the ordinary least squares method, 2) the fixed effect method, and 3) the generalized least squares method. I first controlled for firm differences and then controlled for sector differences. Consistent standard errors are used if there is a heteroskedasticity problem. Then I used the Hausman Specification test to select the best model to interpret the results. The whole sample dataset was used first in estimating the model. Then I estimated the model using a smaller data that includes firms with observation before and after the liberalization. The choice of data for the smaller dataset depended on the chosen liberalization year.

B.2. The Effect of Stock Market Liberalization on Firm Investment rate and Firm Cost of Capital

B.2.1. The Effect of Stock Market Liberalization on Firm Investment rate

In order to find whether stock market liberalization affects firm investment rate, I use the real growth rate of firm property plant and equipment to proxy for the real growth rate of firm investment. The real growth rate of firm property plant and equipment is

calculated as the growth rate of nominal firm property plant and equipment minus a change in the price index of domestic gross capital formation. It is argued in many finance papers that investment is related to the cost of capital. In most finance papers, the dividend yield is used as a proxy for cost of capital. According to Bakaert and Harvey (2000), a change in the cost of capital may be reflected in a change in dividend yields. Patro and Wald (2002) argued that dividend yield is a superior measure of the cost of capital. Bhattacharya, Daouk, and Welker (2003) argue that the advantage of using dividend yields to measure the cost of capital is that dividend yields are observable and stationary. The International Asset Pricing Model (IAPMs), under capital market segmentation, predicts that as a capital market is integrated, the cost of capital will decline as risk is internationally diversified. In order to see whether the dividend yield declines after the stock market liberalization, I plotted the average dividend yield against time. If the dividend yield falls following the liberalization comparing to the pre-liberalization level, this implies that the cost of capital declines. If the cost of capital declines, investment is expected to rise. In other words, if stock market liberalization reduces the cost of capital, investment is expected to rise. Chari and Henry (2004) mentioned the effect of stock market liberalization on firm investment. They related firm-specific risk sharing to a firm's physical investment. They used the variable DIFCOV, that is, the difference between the covariance of firm i's stock return with the local market index with the covariance of firm i's stock return with the world market index. The variable DIFCOV represented the risk sharing that occurs after stock market liberalization. Chari and Henry (2004) argued that they should observe relatively more

investment by firms whose systematic risk falls and relatively less by those whose systematic risk rises after stock market liberalization. As a result, a firm that has high DIFCOV should experience faster capital stock growth than a firm that has low DIFCOV following the stock market liberalization.

Chari and Henry (2005) assume a standard neoclassical production framework, that is all firms are price-takers, the production function is linear homogenous in capital and labor, and the cost of installing capital is linear homogenous in investment (I) and K (stock of capital). They assume all investors have an identical coefficient of relative risk aversion. They assume the marginal Tobin's Q and average Tobin's Q are equal. Therefore, the investment equation before the liberalization can be written as:

$$\left(\frac{\boldsymbol{I}}{\boldsymbol{K}}\right)_{\boldsymbol{i}} = \boldsymbol{a} + \boldsymbol{b}\boldsymbol{Q}_{\boldsymbol{i}} \qquad (14)$$

Where Q= Tobin's Q = $\frac{\boldsymbol{V}_{\boldsymbol{i}}}{\boldsymbol{K}_{\boldsymbol{i}}}$ where $\boldsymbol{V}_{\boldsymbol{i}}$ is the stock market value of firm and $\boldsymbol{K}_{\boldsymbol{i}}$ is the replacement cost of firm capital stock. $\boldsymbol{V}_{\boldsymbol{i}}$ is the present discounted value of the firm's expected future cash flow. Let's $\bar{\pi}_{\boldsymbol{i}}$ = firm's stochastic cash flow, which is expected to grow at a rate $\boldsymbol{g}_{\boldsymbol{i}}$. It follows

$$\text{Q} = \frac{\boldsymbol{V}_{\boldsymbol{i}}}{\boldsymbol{K}_{\boldsymbol{i}}} = \frac{\bar{\pi}}{\boldsymbol{K}_{\boldsymbol{i}}\left[\boldsymbol{r} + \theta_{\boldsymbol{i}} - \boldsymbol{g}_{\boldsymbol{i}}\right]} \qquad (15)$$

Where r is the economy's risk free rate, $\bar{\pi}_{\boldsymbol{i}}$ is the expected value of $\pi_{\boldsymbol{i}}$, $\theta_{\boldsymbol{i}}$ is the risk premium, $\boldsymbol{g}_{\boldsymbol{i}}$ is the expected growth rate of firm's future cash flow. Equation (15) is derived from the Constant Growth Model. The firm's stochastic cash

flow grows at rate g. The firm's stochastic cash flow is discounted by the risk free rate and risk premium. θ_i and $\boldsymbol{g}_i$ have to be constant for each firm.

When the country liberalizes the stock market, the firm cost of capital as shown by the risk free rate, the risk premium, and the expected future growth rates change. Let $\boldsymbol{r}^*$, θ_i*, and $\boldsymbol{g}_i$* denote the post-liberalization value of risk free rate, risk premium and the expected future growth. Changes in Q will drive a subsequent adjustment in the firm capital stock to reestablish equilibrium. Q* denotes the Tobin's Q after the liberalization. Therefore, change in investment after liberalization can be written as follow:

$$\Delta\left(\frac{\boldsymbol{I}}{\boldsymbol{K}}\right)_i^* = \boldsymbol{b}\Delta\boldsymbol{Q}_i^* \tag{16}$$

$$\left(\frac{\boldsymbol{I}}{\boldsymbol{K}}\right)_i^* - \left(\frac{\boldsymbol{I}}{\boldsymbol{K}}\right)_i = \frac{\boldsymbol{b}\bar{\pi}}{\boldsymbol{K}_i\left[\boldsymbol{r}^* + \theta_i^* - \boldsymbol{g}_i^*\right]} - \frac{\boldsymbol{b}\bar{\pi}}{\boldsymbol{K}_i\left[\boldsymbol{r} + \theta_i - \boldsymbol{g}_i\right]}$$

$$= \frac{\boldsymbol{b}\bar{\pi}}{\boldsymbol{K}_i\left[\boldsymbol{r} + \theta_i - \boldsymbol{g}_i\right]\left[\boldsymbol{r}^* + \theta_i^* - \boldsymbol{g}_i^*\right]}\left[(\boldsymbol{r} - \boldsymbol{r}^*) + (\theta_i - \theta_i^*) + (\boldsymbol{g}_i^* - \boldsymbol{g}_i)\right]$$

$$= \lambda_i\left[(\boldsymbol{r} - \boldsymbol{r}^*) + (\theta_i - \theta_i^*) + (\boldsymbol{g}_i^* - \boldsymbol{g}_i)\right] \tag{17}$$

Where $\lambda_i = \dfrac{\boldsymbol{b}\bar{\pi}}{\boldsymbol{K}_i\left[\boldsymbol{r} + \theta_i - \boldsymbol{g}_i\right]\left[\boldsymbol{r}^* + \theta_i^* - \boldsymbol{g}_i^*\right]}$

$(\boldsymbol{r} - \boldsymbol{r}^*)$, $(\theta_i - \theta_i^*)$, and $(\boldsymbol{g}_i - \boldsymbol{g}_i^*)$ are change in risk free rate, change in risk premiums, and change in expected future growth rate of firm cash flow as the result of the stock market liberalization. Refer to equation (2) and (4), risk premium before liberalization is $\beta_{im}\gamma\sigma^2{}_m$ and risk premium after liberalization is $\beta_{iw}\gamma\sigma^2{}_w$. Refer to equation (5) and (6) and assume all investors have constant coefficient of risk aversion, I can rewrite $(\theta_i - \theta_i^*)$ as follow.

$$(\theta_i - \theta_i^*) = \beta_{im}\gamma\sigma^2{}_m - \beta_{iw}\gamma\sigma^2{}_w$$

$$= \frac{COV(R_i, R_m)}{\sigma^2_m}\gamma\sigma^2{}_m - \frac{COV(R_i, R_w)}{\sigma^2_w}\gamma\sigma^2{}_w$$

$$= \gamma\, COV(R_i, R_m) - \gamma\, COV(R_i, R_w)$$

$$= \gamma\, DIFCOV_i \qquad (18)$$

Where $DIFCOV_i = [COV(R_i, R_m) - COV(R_i, R_w)]$. Therefore, $\Delta\left(\frac{I}{K}\right)_i^*$ can be rewritten as follow:

$$\Delta\left(\frac{I}{K}\right)_i^* = \lambda\left[(r - r^*) + \gamma DIFCOV_i + (g_i^* - g_i)\right] \qquad (19)$$

Where $(r - r^*) + \gamma\, DIFCOV_i$ is change in the firm cost of capital and $(g_i - g_i^*)$ is change in firm growth rate of earning. Therefore, post-liberalization investment is affected by the change in firm cost of capital and change in firm growth rate of earning. $(r - r^*)$ is change in risk free rate after liberalization and is the common shock to all firms in the economy. According to the International Asset Pricing model, the relevant benchmark for pricing the individual stocks changes from the local stock market index to a world market index after liberalization (Chari and Henry 2005). Therefore, if the COV (R_i, R_m) is before liberalization is larger than COV (R_i, R_w) after liberalization, the cost of capital should fall following the liberalization. As the cost of capital falls, the investment is expected to increase following the liberalization. In other words, the firms that experience a fall in their cost of capital should invest more (Chari and Henry 2005). For change in firm growth rate of future cash flow $(g_i - g_i^*)$, the larger the growth rate of the firm's future cash flow, the greater the change in firm investment rate following the liberalization (Chari and Henry 2005). I use dividend yields as proxy of the firm cost

of capital and follow Chari and Henry 2005 by using the growth rate of firm sales to proxy for the firm's future cash flow.

In order to estimate the liberalization effect on firm investment rate, I first conducted a t-test to identify whether there is a significant change in firm investment rates following each stock market liberalization year under four scenarios: 1) all years before and after liberalization, 2) 5 years before and 5 years after liberalization, 3) 3 years before and 3 years after liberalization, and 4) 1 year before and 1 year after liberalization. According to the International Asset Pricing model prediction, the cost of capital should decline from the pre-liberalization level following the stock market liberalization due to risk is diversified. Therefore, if the International Asset Pricing Model is correct, I should observe an increase in firm investment following the liberalization. In addition to a t-test for a significant change in firm investment rate, I also conduct a t-test to identify whether there is a significant change in firm cost of capital following the stock market liberalization.

In order to find whether stock market liberalization affects firm investment rate, I use the same methodology for the stock market return.

$$REALG\_PPE_{it} = FIRM_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi_4 LIBAF + \Theta_4 D97 + e_{it} \quad (20a)$$

$$REALG\_PPE_{it} = SECTOR_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi_4 LIBAF + \Theta_4 D97 + e_{it} \quad (20b)$$

Equation (20) is used to capture the direct effect of stock market liberalization on firm investment rate. REALG-PPE is real growth rate in firm property plant and equipment used to proxy for firm investment rate. REALG_PPE is calculated as a

change in log of firm property plant and equipment this period from the last period minus a change in log of gross capital formation index (GCFI) this period from the last period. That is, REALG_PPE = $[\ln(PPE_t)-\ln(PPE_{t-1})] - [\ln(GCFI_t)-\ln(GCFI_{t-1})]$. The domestic gross capital formation index is generated from the domestic gross fixed capital formation at current price divided by the domestic gross fixed capital formation at constant price. The domestic gross capital formation data is obtained from the World Development Indicators.

Then I add the control variables to see whether the liberalization effects are different when controlled variables are included.

$$REALG\_PPE_{it} = FIRM_i + \lambda_1 DIV_{it-1} + \lambda_2 G\_SALES_{it} + \lambda_3 LNTA_{it-1} + \delta PRELIB + \theta_1 LIB0 + \theta_2 POSTLIB + \theta_3 LIBAF + \Theta_4 D97 + e_{it} \quad (21a)$$

$$REALG\_PPE_{it} = SECTOR_i + \lambda_1 DIV_{it-1} + \lambda_2 G\_SALES_{it} + \lambda_3 LNTA_{it-1} + \delta PRELIB + \theta_1 LIB0 + \theta_2 POSTLIB1 + \theta_3 LIBAF + \Theta_4 D97 + e_{it} \quad (21b)$$

The firm investment rate (REALG_PPE) is a function of firm cost of capital (DIV), growth rate of firm's expected future cash flow (G_SALES), and firm size (LNTA). DIV_{it-1} is cost of capital last period and $LNTA_{it-1}$ is firm size last period. I expect λ_1 to be negative as investment is negatively related to cost of capital. I expect λ_2 to be positive according to equation (19), the larger increase in the growth rate of the firm's future cash flow, the greater the change in firm investment rate following the liberalization (Chari and Henry 2005). Chari and Henry (2005) find that 1% increase in firm's expected future cash flow predicts a 4.1% increase in firm investment rate. If λ_3 is positive, this implies that a firm size is positively related to firm investment. If stock

market liberalization has a positive effect on a firm investment rate, the θ-coefficients will be positive and significant. If Henry (2000a) is correct, the θ-coefficients will be positive since he found that the stock market liberalization leads to private investment booms. According to Henry (2000a), from a sample of 11 developing countries that liberalized their stock markets, 9 experienced growth rates in private investment above their non-liberalization median in the first year after liberalization. In the second and third years after liberalization, this number is 10 of 11, and 8 of 11, respectively (Henry, 2000a). I concentrate on the during and post-liberalization effects of stock market liberalization on firm investment rate (θ_1 and θ_2).

B.2.2. The Effect of Stock Market Liberalization on Firm Cost of Capital

According to the International Asset Pricing Model under capital market segmentation, the firm cost of capital should decline following the stock market liberalization. I first conduct a t-test to identify whether there is a significant change in firm cost of capital following the stock market liberalization under the same four main scenarios. The following models are used to identify the pre, during, post, and after effects of stock market liberalization on firm cost of capital.

$$DIV_{it} = FIRM_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (22a)$$

$$DIV_{it} = SECTOR_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (22b)$$

Equation (22) is used to capture the direct effect of stock market liberalization on cost of capital. DIV is firm dividend yield used as a proxy for firm cost of capital. I expect the cost of capital to declines following the liberalization. Then I add the control variables to see whether the liberalization effects are different when controlled variables are included.

$$DIV_{it} = FIRM_i + \Theta_1 LNTA_{it} + \Theta_2 G\_EPS_{it} + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4 LIBAF + \Theta_4 D97 + e_{it} \quad (23a)$$

$$DIV_{it} = SECTOR_i + \Theta_1 LNTA_{it} + \Theta_2 G\_EPS_{it} + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4 LIBAF + \Theta_4 D97 + e_{it} \quad (23b)$$

LNTA is the log of firm total asset as a proxy for firm size. G_EPS is growth rate of firm earning per shares. In corporate finance theory, the cost of capital composed of dividend yield plus the growth rate of firm earning per share. The growth rate of firm earning per share for the case of Thailand is large and unstable. Therefore, I use only the dividend yield to measure the cost of capital. If the cost of capital is fixed, I should observe an inverse relationship between dividend yield and the firm growth rate of earning per share. Therefore, I expect a negative relationship between firm dividend yield and firm growth rate of earning per share. Higher dividend payment implies lower retained earning. When retained earning is lower, this implies lower investment. This will further reduce the firm growth rate of net income and lower firm growth rate of earning per share. I follow the same estimation method in estimating equations (22) and (23). If the International Asset Pricing Model, is true, the firm cost of capital should fall following the stock market liberalization.

B.3. The Effect of Stock Market Liberalization on Firm Performance

In order to find the effect of stock market liberalization on firm performance, Tobin's Q ratio is used to measure firm performance. Tobin's Q ratio is a ratio of a firm's financial market value divided by the replacement cost of its assets. James Tobin first introduced the ratio in 1969 as a predictor of a firm's future investment (Bharadwaj, Bharadwaj, and Konsynski, 1999). According to Bharadwaj, Bharadwaj, and Konsynski (1999), Tobin's Q can be used as a) an alternative measure of business performance, b) a predictor of profitable investment opportunity, c) a measure of the capitalized value of monopoly rents, d) a measure of returns from diversification, e) an indicator of a firm's intangible value, f) a measure of brand equity, and g) a measure of the value of technological assets. In addition, industrial organization economists and strategy researchers have used Tobin' s Q ratio to study the effects of market power on performance, especially where accounting measures have failed to detect any performance effects (Bharadwaj, Bharadwaj, and Konsynski, 1999). Tobin's Q ratio measures market power from both existing assets and future growth potential of the firm (Bharadwaj, Bharadwaj, and Konsynski, 1999).

In this study, I first use Tobin's Q to measure firm performance. Bharadwaj, Bharadwaj, and Konsynski (1999) argue that Tobin's Q is a better measure of firm performance in terms of future profitability than standard accounting-based measures. The standard accounting measures to measure firm performance are return on asset, return on equity, and return on sales. They argue that one drawback of standard accounting measures is that they typically reflect only past information and are not forward looking. Other drawbacks are that the standard accounting measures are not

adjusted for risk, and they are distorted by temporary disequilibrium effects, tax laws, and accounting convention (Bharadwaj, Bharadwaj, and Konsynski, 1999). In addition, they argue that accounting measures of firm performance are insensitive to the time lags necessary for realizing the potential of capital investment. Bharadwaj, Bharadwaj, and Konsynski (1999) mention that Tobin's Q has been shown to reflect ex ante financial market valuation of the level and risk of future profitability. Therefore, it provides a market estimate of the firm's long-run performance (Bharadwaj, Bharadwaj, and Konsynski, 1999). Therefore, I use both Tobin's Q and ROA, the standard accounting measure of firm performance, in measuring the firm performance to see whether the liberalization effects are different between the two measures of firm performance.

I follow Chari and Henry (2005) and calculate Tobin's Q as:

$$\text{Tobin's Q} = \frac{\text{Market Value of equity + Book value of debt}}{\text{Book value of total asset}} \qquad (24)$$

That is, Tobin's Q equal the sum of market value of equity and the book value of debt all divided by book value of total assets. Then book value of debt is used instead of market value of debt due to market value of debt is not available. The market value of equity is the firm stock price multiplied by firm number of shares outstanding, which is the firm market capitalization. The book value of debt is the book value of total liability. According to equation (17), change in Tobin's Q following the liberalization equals to $\lambda_i\left[(\boldsymbol{r}-\boldsymbol{r}^*)+(\theta_i-\theta_i^*)+(\boldsymbol{g}_i^*-\boldsymbol{g}_i)\right]$, which is sum of firm cost of capital and change in growth rate of firm future cash flow. According to the International Asset Pricing model, the cost of capital falls following the liberalization. If the liberalization reduces firm cost of capital and increase growth rate of firm future cash flow, Tobin's Q value should rise

following the liberalization. Chari and Henry (2005) find the average firm experiences a 46.1% increase in Tobin's Q during liberalization. Therefore, I expect Tobin's Q value to increase following the stock market liberalization.

To identify whether there is significant change in firm Tobin's Q value following the stock market liberalization, I conduct a t-test under four main scenarios. In order to estimate the effect of stock market liberalization on firm Tobin's Q, I use the following equation.

$$TOBINQ_{it} = FIRM_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (25a)$$

$$TOBINQ_{it} = SECTOR_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (25b)$$

Equation (25) captures the direct effect of the stock market liberalization. The dummy variable LIB0 will take years 1985 and 1987 one at a time in separated model. I expect to see an improvement in firm performance following the liberalization. Then I add the control variables to see whether the liberalization effects are different when controlled variables are included.

$$TOBINQ_{it} = FIRM_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (26a)$$

$$TOBINQ_{it} = SECTOR_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (26b)$$

Firm performance is a function of firm market share (MKTSHARE), firm debt to equity ratio (DEBTEQ), firm size (LNSL), and liberalization dummy variables. Firm

debt to equity ratio is calculated as firm total liability divided by firm total equity, used to measure firm leverage. Haksar and Kongsamut (2003) find a larger market share is associated with stronger firm performance while a high debt to equity ratio is associated with poor performance. Therefore, I expect a positive relationship between firm market share and firm Tobin's Q and a negative relationship between firm debt to equity ratio and firm Tobin's Q. Bharadwaj, Bharawaj, and Konsynski (1999) also find a positive relationship between firm performance and market share. Therefore, I expect τ_1 to be positive. If the coefficients of the dummy variables are significant and positive, this implies that the stock market liberalization has positively affected firm performance in the pre, during, post, and after the stock market liberalization periods.

Besides using Tobin's Q to measure firm performance, I also use firm Return on Asset (ROA) since it is a standard accounting measure to evaluate firm performance. I try to identify whether the effect of stock market liberalization is different between those two measures of firm performance. The firm performance as measured by ROA is as follows.

$$ROA_{it} = FIRM_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (27a)$$

$$ROA_{it} = SECTOR_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (27b)$$

$$ROA_{it} = FIRM_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (28a)$$

$$ROA_{it} = SECTOR_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (28b)$$

ROA is firm return on asset calculated as firm net income divided by firm total asset. $MKTSHARE_{it-1}$ is firm market share last period and $DEBTEQ_{it-1}$ is firm debt to equity ratio last period. Lag value of DEBTEQ is used to avoid the problem of simultaneity. I follow the same estimation method for the effect of stock market liberalization on firm Main board share price, firm investment, and firm cost of capital. I expect the estimation results using ROA as a proxy for firm performance to be similar to the estimation results using Tobin's Q as a proxy for firm performance.

CHAPTER V

FINDINGS

A. The Revaluation Effect of Stock Market Liberalization

Many studies of stock market liberalization have shown that stock market liberalization will lead to an increase in the stock return during liberalization period (Henry, 2000b; Bakeart and Harvey, 2000). Kim and Singal (2000) found increases in stock market return soon after the opening of markets, is followed by a subsequent reduction in returns that was sometime significant. According to the International Asset Pricing Model (IAPMs), holding expected future cash flow constant, we should see an increase in an emerging country's equity price index when the market learns of impending stock market liberalization. According to investment theory, in a segmented market, the market portfolio of securities is priced according to the home market index (Chan and Yu, 2003). When the market is liberalized, the market portfolio of securities is priced according to the world index, and the securities are revalued according to the world market price of risk (Chan and Yu, 2003). Stulz (1999) argued that stock market liberalization results in risk sharing between domestic and foreign investors. Chari and Henry (2004) found that the historical covariance of the average investible firm stock return with the local market index is roughly 200 times larger than its historical

covariance with the world market index. That is, the risk declines following stock market liberalization. As international diversification reduces risk, investors are willing to accept lower returns on their investments (Chan and Yu, 2003). However, the risk is diversified in the long-run. Therefore, I would expect a short term surge in stock prices level around stock market liberalization and a long-run reduction in the stock price. According to Henry (2000b), the International Asset Pricing Model (IAPMs) predicts that stock market liberalization will reduce the country's cost of equity capital by allowing for risk sharing among domestic and foreign investors and holding expected future cash flows constant, and the reduction in the country's cost of capital is likely to increase the country's equity price index following liberalization. Therefore, I tried to identify whether the International Asset Pricing Model holds using firm-level data from the Stock Exchange of Thailand.

According to Stulz (1999), liberalization transforms the relationship between the firms and the providers of capital. Before liberalization, the only source for a firm capital is from domestic saving. After stock market liberalization, firms are able to access external sources of capital beyond domestic saving thereby enabling them to raise funds using new securities and to invest in new projects. According to Stulz (1999), saving and investment can differ when liberalization takes place. Liberalization affects the cost of capital through its effect on domestic interest rate and risk premium. Stock market liberalization induces the capital to flow into a country thereby reducing the cost of capital by reducing the risk free rate. Stock market liberalization also allows risk sharing, thereby reducing risk premium, which is another cost of capital.

Since the reduction in the risk free rate from stock market liberalization is

likely to affect all the firms in the Stock Exchange of Thailand equally, I focus on the changes in risk premium following stock market liberalization. Following Stulz (1999), I assume that investors in Thailand are risk averse and care only about their investment's expected return and the variance of the stock return. According to Stulz (1999), risk is measured by the variance of the stock return. Stulz (1999) also argued that if the investors have the same coefficient of risk aversion, the risk premium is the coefficient of relative risk aversion times the variance of the return on the market portfolio. Therefore, a decline in the variance of the return declines or in other words, the return volatility implies a decline in risk premium. Stulz (1999) argued that as a country liberalizes, the domestic investors no longer have to bear all the risk. The foreign investors who invest in liberalizing country have to bear some of the risk. The diversification in risk because of liberalization will cause a reduction in return volatility thereby causing a reduction in the risk premium. Therefore, liberalization induces risk sharing and thereby reduces the firm cost of capital. To see the impact of stock market liberalization on firm stock return and firm cost of capital, I follow Stulz (1999) using the small country case because Thailand is a small country. I assume that investors in Thailand have constant risk aversion and that the price per unit of risk is constant. Following stock market liberalization, the Thailand Stock market is part of the world equity market, and I assume that the capital asset pricing model holds for both Thailand and for the world equity market. Therefore, following stock market liberalization, the gap in the risk premium is the difference between the risk premium before and after stock market liberalization. The differences in firm risk premium following stock market liberalization is the differences between the covariance of Thai firm stock return with the return of local market index

before the stock market liberalization and the covariance of the Thai firm stock return and the world market portfolio return. If the covariance of the Thai firm stock return with the return on local market index is higher than the covariance of the Thai firm stock return and the return of the world market portfolio, this implies that the risk premium declines following stock market liberalization. As risk premium declines, the firm cost of capital falls since the risk is diversified. That is, before liberalization, the volatility of the return depends only on the covariance of the Thai firm stock return with the return of the local market index. After liberalization, the risk is diversified since the risk of holding the Thai securities now depends on the covariance of the Thai firm stock return and the return of the world market portfolio, and the firm cost of capital declines. A reduction in firm cost of capital through a reduction in firm risk premium will cause a reduction in firm expected stock return. As the firm expected stock return falls, the securities price is likely to rise. If the securities price rises enough, the stock return will also rise.

In order to prove whether the firm cost of capital falls following Thailand stock market liberalization, I calculated the covariance of Thai firm stock return with the return of the local market index. In the period of study, the covariance of the Thai firm stock return with the local market index is 0.1611 and the covariance of the Thai firm stock return with the world market index is -0.0078. Therefore, the covariance of the Thai firm stock return with local market index is higher than the covariance of the Thai firm stock return with the world market index. Since the covariance of the Thai firm stock return with the return on local market index is higher than the covariance of the Thai firm stock return and the return of the world market portfolio, this implies that the risk premium declines following stock market liberalization. As risk premium declines, the firm cost of

capital falls and the expected return falls. Therefore, according to the prediction of the International Asset Pricing model, the firm stock price should rise following the liberalization.

In order to identify whether the firm stock price and firm stock return rises following the 1985, 1987, and 1991 stock market liberalization, I first plot the mean value of the firm Main board share price from 1976 to 2003 to see the movement of the firm stock prices. Figure 1 shows the behavior of the mean value of the firm Main board share price from 1976 to 2003. Since the Stock Exchange of Thailand was established on 1975, Figure 1 also shows the movement of the mean value of the firm Main board share price since the establishment of the Stock Exchange of Thailand. As shown in Figure 1, the firm Main board share price tends to move upward and reached the highest value in 1978. After 1978, it goes down and bounces back again after 1985, which is the first liberalization year in my sample. In 1985 the Bangkok fund limited was first launched on the London Stock Exchange according to Bakeart and Harvey's chronology of economics, political, and financial events in emerging markets. The firm Main board share price reaches the second highest value in 1987, which is the second liberalization year in my sample. In September 1987, the Alien board was inaugurated in the Stock Exchange of Thailand in addition to the Main board to facilitate foreign trading. The firm Main board share price falls after reaching the third highest point in 1989 and bounced back a little bit again after 1991, the additional liberalization year in my sample and the year that the first ADR was announced. As shown in Figure 1, the firm Main board share price increases slightly when the 1985 stock market liberalization takes place but increases sharply when the 1987 stock market liberalization takes place.

Figure 2 illustrates the mean value of the firm Main board stock return from 1976 to 2003. Firm Main board stock return reduces when 1985 stock market liberalization takes place. Firm Main board stock return reaches the highest point in 1987, the year that the Alien board was inaugurated. Firm Main board stock return then falls and rises again after 1988. The firm Main board stock return then falls and rises again after 1990. The firm Main board stock return also rises after 1991 and then falls after 1993. Slightly different from the effect of stock market liberalization on firm Main board share price, the firm Main board stock return declines slightly when the 1985 stock market liberalization takes place. However, the firm Main board stock return rises sharply when the 1987 stock market liberalization takes place. An increase in the firm Main board stock return when the 1987 stock market liberalization takes place shows that the establishment of the Alien board has a large positive effect on both firm Main board share price and firm Main board stock return.

To see more closely the impact of stock market liberalization on firm Main board share price using 1985, 1987, and 1991 as during liberalization years, I calculate the mean value of firm Main board share price in pre, during, post, and after period of each liberalization year. Figure 3 plots the movement of the mean value of firm Main board share prices following each stock market liberalization year. The firm Main board share price does not change much from pre- liberalization level following the 1985 liberalization. The firm Main board share price then increases in one and two years after 1985 liberalization and falls after that. The post-liberalization value of the firm Main board share price following the 1985 liberalization is higher than the pre-liberalization level. However, the firm Main board share price increases sharply from the pre-

liberalization levels when the 1987 stock market liberalization takes place. The firm Main board share price following the 1987 stock market liberalization, however, declines both one and two years after the 1987 liberalization and the period after that. The post-liberalization value of the firm Main board share price following the 1987 stock market liberalization is still higher than the pre- liberalization but the after-liberalization value is lower. A larger increase in the firm Main board share price from pre-liberalization levels during the 1987 stock market liberalization is consistent with the study of Patro and Wald (2002). The long run reduction in the firm Main board share price following liberalization in all liberalization years is consistent with the results found by Kim and Singal (2000). Figure 4 shows the movement of the mean value of the firm Main board stock return. The results in Figure 4 are similar to the results in Figure 3. The firm Main board stock return declines slightly during the 1985 liberalization. The firm Main board stock return increases in the post period and declines afterward. As in the case of the firm Main board share price, the firm Main board stock return increases sharply during the 1987 stock market liberalization. This shows that the establishment of the Alien board has a short-run positive impact on firm Main board stock return and stock price. The firm Main board stock return then falls sharply in the post and after period of the 1987 liberalization. The post and after liberalization values of the firm Main board stock return are lower than pre-liberalization levels following the 1987 liberalization.

I compute a t-test to identify significant changes in the mean value of firm Main board share price and firm Main board stock return before and after each liberalization year under four main scenarios: all years before and after liberalization, 5 years before and 5 years after liberalization, 3 years before and 3 years after liberalization, and 1 year

before and 1 year after liberalization. The 1985 and 1987 are used as the liberalization years to study the revaluation effect of the firm Main board and 1991 is used as the liberalization year to study the revaluation effect of the firm Alien board. The results in Table 6 show that, under all years before and all years after liberalization, the firm Main board share price (P) and the firm Alien board share price (PAB) are significantly lower than pre-liberalization level in all three liberalization years. For the results of the firm Main board stock return, the absolute value of firm Main board stock return also falls in all liberalization years. However, the only year that had significant change in the firm Main board stock return is 1987. The firm Alien board stock return also falls following the 1991 liberalization but a decline is not statistically significant.

In the 5 years before and 5 years after liberalization case, the firm Main board share price was significantly higher than pre-liberalization levels following the 1985 liberalization. The change in firm Main board share price following the 1987 liberalization was positive but not statistically significant. The firm Alien board share price significantly declines following the 1991 liberalization. The firm Main board stock return significantly declines following the 1987 liberalization.

When the period is 3 years before and 3 years after liberalization, the firm Main board share price significantly increases from pre-liberalization levels following the 1985 liberalization. The firm Main board share price also significantly increases from pre-liberalization levels following the 1987 liberalization despite a significant reduction in firm Main board stock return following 1987. However, the firm Alien board share price is significantly lower than pre-liberalization level following the 1991 liberalization. A

change in firm Alien board stock return following the 1991 liberalization is not statistically significant.

When the time period is 1 year before and 1 year after liberalization, the firm Main board stock return significantly increases from pre-liberalization levels following the 1985 liberalization. The firm Main board share price also increases from pre-liberalization levels following 1985 liberalization but the increase is not statistically significant. The firm Main board share price also significantly increases from pre-liberalization level following 1987 stock liberalization. However, despite this, the firm Main board stock return is significantly less than pre-liberalization levels. Both firm Alien board stock price and stock return are significantly lower than pre-liberalization level following the 1991 liberalization. Therefore, the 1991 stock market liberalization seems to have negative impact on both firm Alien board stock price and stock return regardless of which time interval is.

In the next section, I develop the model to evaluate the effect of 1985, 1987, and 1991 stock market liberalization. The main concentration is on the revaluation effect of the firm Main board stock return following the 1987 liberalization and the revaluation effect of the firm Alien board stock return following the 1991 liberalization.

A.1 The During, Post, and After Effects of the 1985 and 1987 Stock Market Liberalization on Firm Main Board Stock Return

Kim and Singal (2000) found that stock return increases soon after the opening of the market and is followed by subsequent reductions in return that are sometimes

significant. Patro and Wald (2002) also found a larger increase in return during liberalization and a large decrease in return after liberalization. The International Asset Pricing model also predicts that the stock market liberalization should induce an increase in firm share price because of lower cost of capital following the liberalization. Therefore, to get a better understanding of how firm Main board stock return is affected by stock market liberalization, I evaluated the pre, during, post, and after effect of stock market liberalization using the following model.

$$RETURN_{it} = \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Firm_i + e_{m\,it} \quad (8a)$$

$$RETURN_{it} = \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Sector_i + e_{m\,it} \quad (8b)$$

I focus on the effect of the 1987 stock market liberalization. LIB0 represents during 1987 liberalization. In estimating model (8), I compare the effect of 1987 stock market liberalization to two years before liberalization level (PRELIB).

The heteroskedasticity test shows that heteroskedasticity exists, therefore the consistent standard error is used. I estimate model (8) using the Ordinary least squares estimation, the fixed effect estimation, and the panel-generalized least squares estimation. I use the Hausman Specification test to pick the best estimation method. The Hausman Specification test is an asymptotic test based on the distribution of the quadratic form that results form the differences between a consistent estimator under null and alternative hypothesis and an inconsistent estimator under the alternative hypothesis but efficient under the null hypothesis. The null hypothesis is that the difference in coefficients between the two estimation methods is not systematic. If the Hausman Specification test does not reject the null hypothesis, there is no systematic difference between the two

estimators. Using the whole sample dataset, regardless of whether firm or sector differences are controlled, the Hausman Specification test picks the fixed effect estimation over others estimation methods. Therefore, the results of the fixed effect estimation are in Table 8.

The whole sample dataset, which is the total dataset, and sub sample dataset, which includes only the firms that have observations before and after 1987, are used in estimating the models to identify whether the revaluation effects are different when dataset is smaller. The estimation results with only dummy variables using the whole and sub-sample dataset both show that the firm Main board stock return increases from the pre-liberalization level in the liberalization period regardless of whether firm or sector differences are controlled. The difference between the pre and the post liberalization return is negative and in most cases significant. The estimation results using whole and sub-sample dataset both shows that the firm Main board stock return declines from the pre-liberalization level in the after liberalization period. When the whole sample dataset is used, the firm Main board stock return increases from the pre-liberalization level by 71.50% when firm differences are controlled and by 71.54% when sector differences are controlled in the liberalization year. When the sub sample dataset is used, the firm Main board stock return increases from the pre-liberalization level by 71.48% when firm differences are controlled and by 71.37% when sector differences are controlled in the liberalization year. When sub-sample dataset is used, the firm Main board stock return declines from the pre-liberalization period by 19.47% when firm differences are controlled and by 18.52% when sector differences are controlled in POSTLIB period. The firm Main board stock return also significantly declines from the pre-liberalization

level in the LIBAF period of the 1987 liberalization regardless of which dataset is used and which firm or sector differences are controlled. Next, I add the control variables to identify whether the liberalization results are different using the following models.

$$RETURN_{it} = \gamma_{1m} LNSL_{m\,it} + \gamma_{2\,m} MB_{mit-1} + \gamma_{3m} LNNS_{mit-1} + \gamma_{4m} WRETURN_{m\,it} + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Firm_i + e_{m\,it} \quad (9a)$$

$$RETURN_{it} = \gamma_{1m} LNSL_{m\,it} + \gamma_{2\,m} MB_{mit-1} + \gamma_{3m} LNNS_{mit-1} + \gamma_{4m} WRETURN_{m\,it} + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Sector_i + e_{m\,it} \quad (9b)$$

The firm specific fixed effect estimation and sector specific fixed effect estimation using either dataset shows that the firm Main board stock return falls when firm size is larger. This might due to the fact that larger firms have lower growth opportunity thereby causing the revaluation effects to be smaller. The negative relation between firm stock return and firm size and firm market to book ratio are consistent with the study of Fama and French (1995). In addition, the high level of firm liquidity positively affects the firm stock return. The positive correlation between firm stock return and world stock return is consistent with the study of Christoffersen, Chung, and Erruza (2002). However, the world stock return variable is positive but not statistically significant when sub-sample dataset is used. When the control variables are included, the revaluation effects on the firm Main board stock return are similar to the results without controll variables. Using either dataset, the firm Main board stock return increases from the pre-liberalization level in the liberalization period and falls from the pre-liberalization level in the post and after periods. The firm specific fixed effect estimation shows that the firm Main board stock return increase from the pre-liberalization level by 73.83%

when whole sample dataset is used an by 71.61% when sub-sample dataset is used in the LIB0 period. The sector specific fixed effect estimation shows a slightly smaller positive effect in the LIB0 period. The firm specific fixed effect estimation shows that the firm Main board stock return declines from the pre-liberalization level by 14.95% when whole sample dataset is used and by 17.49% when sub sample dataset is used in the POSTLIB period. The firm specific fixed effect estimation shows that the firm Main board stock return declines by 41.21% when whole sample dataset is used and by 41.04% when sub-sample dataset is used in the LIBAF period of 1987 liberalization. Therefore, regardless of whether control variables are included, the firm Main board stock return significantly increases from the pre-liberalization level in the during period and declines from the pre-liberalization level in the post and after periods.

To identify whether a change in firm size in LIB0, POSTLIB, and LIBAF period affects the revaluation of the firm Main board share price following the 1987 liberalization, I use the following models.

$$RETURN_{it} = \gamma_{1m} LNSL_{m\,it} + \gamma_{2\,m} MB_{mit-1} + \gamma_{3m} LNNS_{mit-1} + \gamma_{4m} WRETURN_{m\,it} + \gamma_{5m} LNSL_{m\,it} * PRELIB + \gamma_{6m} LNSL_{m\,it} * LIB0 + \gamma_{7m} LNSL_{m\,it} * POSTLIB + \gamma_{8m} LNSL_{m\,it} * LIBAF + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Firm_i + e_{m\,it} \quad (10a)$$

$$RETURN_{it} = \gamma_{1m} LNSL_{m\,it} + \gamma_{2\,m} MB_{mit-1} + \gamma_{3m} LNNS_{mit-1} + \gamma_{4m} WRETURN_{m\,it} + \gamma_{5m} LNSL_{m\,it} * PRELIB + \gamma_{6m} LNSL_{m\,it} * LIB0 + \gamma_{7m} LNSL_{m\,it} * POSTLIB + \gamma_{8m} LNSL_{m\,it} * LIBAF + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Sector_i + e_{m\,it} \quad (10b)$$

The effects of firm size on firm Main board stock return in the LIB0, POSTLIB, and LIBAF periods are not statistically significant. That is, an increase in firm size in the

LIB0 and POSTLIB period of 1987 liberalization does not affect the firm Main board stock return. The F-test of whether the coefficients of the interaction variables are equal to zero does not reject the null hypothesis whether the whole or the sub-sample dataset is used when firm differences are controlled. The null hypothesis is rejected when the whole sample dataset is used but not when the sub-sample dataset is used when the sector differences are controlled. When the interaction variables are included, the LIB0 and POSTLIB effects of the 1987 liberalization are not statistically significant when firm differences are controlled using either dataset.

Since the F-test does not reject the null hypothesis that the coefficients of the interaction variables are jointly equal to zero, a change in firm size in the LIB0, POSTLIB and LIBAF periods of the 1987 liberalization does not affect the revaluation effect of the firm Main board stock return. Therefore, I use the results without the interaction variable and conclude that the 1987 stock market liberalization increases the firm Main board stock return in the LIB0 period and reduces the firm Main board stock return in the POSTLIB and LIBAF period. An increase in firm Main board stock return in the LIB0 period following the 1987 liberalization is consistent with the predictions of the International Asset Pricing model that the firm stock price and stock return should be higher following the liberalization due to risk sharing occurs following the liberalization. Therefore, the inauguration of the Alien board in 1987 positively affects the firm Main board stock return during the liberalization takes place.

The estimation results of the effect of 1985 stock market liberalization on the firm Main board stock return are in Table 7. When liberalization year is 1985, the firm Main board stock return declines from the pre-liberalization level in the LIB0 period, increases

in the POSTLIB period, and declines again in the LIBAF period regardless of which dataset is used and whether firm or sector differences are controlled. When control variables are included, both firm and sector specific fixed effect estimations using either dataset also shows a reduction of the firm Main board stock return in the LIB0 and LIBAF period and an increase in firm Main board stock return in the POSTLIB period. Thus, the positive effect of the 1985 liberalization on firm Main board stock return seems to occur in one and two years after liberalization. When the interaction variables are included, the coefficient of the POSTLIB variable is no longer statistic significant. The F-test does not reject the null hypothesis that the coefficients of the interaction variables are jointly equal to zero when firm differences are controlled. Since, the null hypothesis is not rejected, I conclude that a change in firm size in LIB0, POSTLIB, and LIBAF periods of 1985 stock market liberalization does not affect the firm Main board stock return.

Therefore, the 1985 stock market liberalization causes an immediate negative impact on the firm Main board stock return during the liberalization period while the 1987 stock market liberalization causes an immediate positive impact. The 1985 stock market liberalization then causes a positive impact on the firm Main board stock return in the POSTLIB period while the 1987 stock market liberalization causes a negative impact. The firm Main board stock return declines in the LIBAF period following both 1985 and 1987 liberalization.

In the next section, I evaluate the effect of stock market liberalization on firm Alien board Stock Return to see whether the revaluation effects are different from the Main board. The Alien board is established in order to facilitate foreign investment,

therefore, the movement of Alien board share price following the liberalization is important to understand the complete revaluation effect.

A.2. The Effect of Stock Market Liberalization on Firm Alien Board Stock Return

Figure 5 shows that movement of the firm Alien board share price closely resembles the movement of the firm Main board share price. In Figure 2, the mean value of the firm Alien board stock return also closely resembles the mean value of the firm Main board stock return. Khanthavit and Pattarathammas (2004) studied the common factors in stock returns between Main board and Alien board and found that the stock returns in both Main board and Alien board were driven by a common factor and by a specific factor of their own. They found that the common factor such as same common sources of news and fundamental factors that existed for each pair of same stocks drove stock return in the Main and Alien boards to move together. As shown in Figure 5, the mean value of the firm Alien board share price is higher than the mean value of the firm Main board share price. Baily and Jagtiani (1994) mentioned various reasons why the Alien board share price is higher than the Main board share price. They first argued that cross- sectional differences in the supply of shares available to the foreigners in the Alien board could generate cross-sectional differences in Alien board share price and Main board share price. In other words, they argued that the firms with a relatively high weight in foreign investor portfolios but with a tight foreign ownership limits would be in high demand and would exhibit large differences between Alien and Main board share price. Their study found that firms that have tighter foreign ownership limit were associated

with a higher Alien board premium. They further argued that the relative liquidity of Main board and Alien board shares affected the price in the Alien board and Main board. They argued that in terms of foreigners' view, the Alien board had higher liquidity than Main board. Their study found that foreign investors offered a relatively high price for relatively liquid Alien board listings, thereby causing the Alien board share price to be higher than the Main board share price. Lastly their study found that the firms that are information rich from the foreign investors point of view would tend to exhibit a large Alien board share price premium. Bailey, Mao, and Sirodom (2004) found that foreign investors have superior information-processing ability compared to local investors. The fact that foreign investors have superior information-processing skill caused a difference in the share price between the Main board and the Alien board. Bailey, Mao, and Sirodom (2004) argued that the gap between price and volume traded between the two boards could increase as cross-market information flows and information processing declined. Since Thai investors normally traded shares through the Main board and foreigners normally traded shares through the Alien board, the price difference between two boards might be due to the Main board being populated by poorly informed investors with inferior information-processing ability while the unrestricted market was populated by foreign investors with superior information-processing ability (Bailey, Mao, and Sirodom, 2004). In order to evaluate the effect of stock market liberalization on firm Alien board share price and to see whether the revaluation effect of the Alien board share price is different, I followed the same methodology. However, the only liberalization year that I included in the model is 1991 since the Alien board share price starts to appear

on the Alien board in 1988. To evaluate the direct effect of the stock market liberalization on the firm Alien board stock return, I use the following models.

$$RETURNPAB_{it} = \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Firm_i + e_{ab\,it} \quad (11a)$$

$$RETURNPAB_{it} = \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF\ \Theta_5 D97 + Sector_i + e_{ab\,it} \quad (11b)$$

RETURNPAB is firm Alien board stock return. I followed the same estimation methods and first tested for the presence of heteroskedasticity, which exists. Therefore, I use consistent standard error in my estimations. The estimation is done using both whole sample dataset and sub sample dataset that contains only the firms that have observation before and after 1991. I first control for firm differences then later for sector differences.

The fixed effect estimation results are in Table 9. The Hausman specification test cannot reject the null hypothesis that the difference in coefficients between the fixed effect estimation and panel generalized least square are not systematic. Since the results of the fixed effect estimation and panel generalized least square are similar, I use the result of the fixed effect estimation. The firm specific fixed effect estimations using either dataset show that the firm Alien board stock return significantly increases from the pre-liberalization level in the POSTLIB period of the 1991 liberalization The effects of the 1991 liberalization in the LIB0 and LIBAF period of the 1991 liberalization are negative but not statistically significant. When sector differences are controlled, the sector specific fixed effect estimations using either whole or sub-sample dataset show that the firm Alien board stock return significantly declines in the LIB0 period and significantly increases in the POSTLIB period. A reduction in the firm Alien board stock return from the pre-liberalization level in the LIB0 period contrasts to the prediction of

the International Asset Pricing model. Nevertheless, the introduction of the ADRs in 1991 positively affects the firm Alien board stock return in one and two years after the 1991 liberalization.

Next, I included the control variables to see whether the revaluation effects are different when control variables are included.

$$RETURNPAB_{it} = \gamma_{1\,ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Firm_i + e_{ab\,it} \quad (12a)$$

$$RETURNPAB_{it} = \gamma_{1\,ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Sector_i + e_{ab\,it} \quad (12b)$$

The estimation results are in Table 9. The control variables are log of world stock return, log of firm sales to proxy for firm size, firm Alien board market to book ratio to capture firm growth rate, and firm Alien board number of share traded to capture the firm stock liquidity. As in the case of firm Main board stock return, all estimation methods show that the firm Alien board stock return rises when firm size is smaller and when firm growth rate declines. This result contrasts with the result found by Bailey and Jagtiani (1994) that larger firm size positively correlates to firm Alien board stock return. The firm Alien board stock return is positive related to the world stock return. The positive correlation between firm stock return and world stock return is consistent with the study of Christoffersen, Chung, and Erruza (2002). The effect of the firm Alien board stock liquidity is not statistically significant implies the Alien board stock liquidity does not affect the Alien board stock return. The firm specific fixed effect estimation method shows that the firm Alien board stock return significantly declines from the pre-

liberalization level in the LIB0 period and significantly increases in the POSTLIB period. The sector specific fixed effect estimations using either whole or sub-sample dataset show a reduction in the firm Alien board stock return in both LIB0 and LIBAF period of the 1991 stock market liberalization. Therefore, the immediate impact of the introduction of the first ADRs on 1991 causes a negative impact on the firm Alien board stock return during the 1991 liberalization takes place. The positive revaluation effect of the firm Alien board stock return in the POSTLIB following the 1991 liberalization occurs only when firm differences are controlled and when sector specific fixed effect estimation using the whole sample dataset.

To identify whether a change in firm size in LIB0, POSTLIB, and LIBAF period affects the firm Alien board stock return, I add the interaction variables and estimate the following equation.

$$RETURNPAB_{it} = \gamma_{1ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \gamma_{5ab} LNSL_{ab\,it} * PRELIB + \gamma_{6ab} LNSL_{ab\,it} * LIB0 + \gamma_{7ab} LNSL_{ab\,it} * POSTLIB + \gamma_{8ab} LNSL_{ab\,it} * LIBAF + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Firm_i + e_{ab\,it} \quad (13a)$$

$$RETURNPAB_{it} = \gamma_{1ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \gamma_{5ab} LNSL_{ab\,it} * PRELIB + \gamma_{6ab} LNSL_{ab\,it} * LIB0 + \gamma_{7ab} LNSL_{ab\,it} * POSTLIB + \gamma_{8ab} LNSL_{ab\,it} * LIBAF + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Sector_i + e_{ab\,it} \quad (13b)$$

The fixed effect estimation results are in Table 9. When the firm differences are controlled, the coefficients of the interaction variables are not statistically significant. The F-test does not reject the null hypothesis that the coefficients of the interaction variables are jointly different from zero whether firm or sector differences are controlled

and whether the whole or sub-sample dataset is used. Therefore, a change in firm size does not affect the firm Alien board stock return.

In conclusion, the introduction of the first ADRs in 1991 negatively affects the firm Alien board stock return during the liberalization period. The positive effect of the introduction of the ADRs on the firm Alien board stock return occurs only in the POSTLIB period. A reduction of the firm Alien board stock return following the 1991 liberalization in the LIB0 period contrasts with the prediction of the International Asset Pricing model. Since local investors normally trade shares through the Main board and foreign investors normally trade shares through the Alien board, the ability to utilize the information available during those periods might be different. Bailey, Mao, and Sirodom (2004) argued that foreign investors had superior information-processing ability compared to local investors, one factor that drove up the difference between firm Main board and Alien board share prices. Therefore, the difference in information-processing ability between two groups of investors might explain the different effect of the 1991 stock market liberalization between the two boards.

B. The Effect of Stock Market Liberalization on Firm Investment Level and the Effect on Firm Cost of Capital

Figure 8 illustrates the mean value of the real growth rate of firm property plant and equipment, which is used to proxy for firm investment rate from 1976 to 2003. The real growth rate of firm property plant and equipment is calculated as the growth rate of firm property plant and equipment minus the growth rate of the gross capital formation index. From Figure 8, the growth rate of firm investment declines during the 1985 stock

market liberalization. The firm investment rate starts to rise after 1985 and continues to rise and reaches the second highest value in 1990. After 1990, the firm investment rate drops sharply and starts to rise again after 1991. The firm investment rate reaches the highest value in 1992 and falls sharply after that.

Firm investment is significantly related to the cost of capital. I use the dividend yield as a proxy for the cost of capital. Bhattacharya, Daouk and Welker (2003) argue that the advantage of using dividend yields to measure cost of capital is that dividend yields are stationary, observable, and stable. Patro and Wald (2002) argue that dividend yields are a superior measure of the cost of capital. According to the International Asset Pricing model (IAMPs) under capital market segmentation, the cost of capital will decline as risk is diversified internationally. Therefore, the cost of capital should decline following stock market liberalization. Stulz (1999), Patro and Wald (2002), Bakaert and Harvey (1998), and Henry (2003) find that the cost of capital falls following stock market liberalization. Since investment is expected to be negatively related to the cost of capital, the cost of capital is expected to fall following the stock market liberalization. Figure 9 shows the dividend yield from 1976 to 2003. The mean value of the firm cost of capital starts to decline after 1976, picks up after 1978, starts to fall again after 1984, picks up after 1987, and reaches its highest value in 1997, which is the year that Thailand experienced the financial crisis. In order to see the movement of the mean value of firm investment and the firm cost of capital, I plot them together in Figure 10. Figure 10 shows that when firm investment rate rises, firm cost of capital falls especially over the period of 1983 to 1988. The movement of firm investment rate and the cost of capital has a huge gap over the period of 1986 to 1996.

Table 10 shows t-test for whether there are significant changes in firm investment rate following 1985 and 1987 stock market liberalization year. I determine significant changes in four different periods: all years before and all years after the stock market liberalization, 5 years before and 5 years after the liberalization, 3 years before and 3 years after the liberalization, and 1 year before and 1 year after the liberalization. The real growth rate of firm property plant and equipment is used to represent firm investment rate. When the period of study is all years before and all years after the liberalization, there is no significant change in firm investment following each stock market liberalization year, despite the fact that the mean value of firm investment rate in the after liberalization period seems to be higher than the pre-liberalization level. When the period of study is five years before and five years after the liberalization, the investment rate increases significantly following the 1985 and 1987 stock market liberalizations. The firm investment rate significantly increases following the 1985 liberalization when time interval is 5 years before and 5 years after and 3 years before and 3 years after but significantly declines when time period is 1 year before and 1 year after.

I also follow Chari and Henry (2005) by calculating the investment deviation variable following each stock market liberalization year. The investment deviation variable is calculated as the real growth rate of the firm property plant and equipment after the liberalization year minus the mean value of the real growth rate of the firm property plant and equipment calculated over years -3 to -1 where year 0 is the liberalization year. Thus, the investment deviation represents the post-liberalization investment rate compared to the mean value of the pre-liberalization level calculated over three years before liberalization. Therefore, a positive investment deviation implies that

the investment rate in post-liberalization is higher than in pre-liberalization. Following the 1985 liberalization, the investment deviation is less than the mean value of the real growth rate of firm property plant and equipment calculated over years -3 to -1 slightly during the 1985 liberalization. However, the investment deviation is higher than the mean value by 1.48% in the first year following the liberalization. The investment rate is higher by 8.79% and by 16.76% respectively in the second and third year following the liberalization. Following the 1987 liberalization, the investment deviation is higher than the mean value by 8.63% during the 1987 liberalization. The investment rate is higher than the mean value by 11.60%, 28.62%, and by 35.23% respectively in the first year, second year, and third year following the liberalization. Therefore, introduction of the first Thailand fund seems to cause the firm investment rate to be higher than the pre-liberalization level after one year of liberalization. Unlike the 1985 stock market liberalization, an increase in firm investment rate occurs immediately in the year that 1987 stock market liberalization takes place. The increase in firm investment rate continues to be higher than the pre-liberalization level especially over the six-year horizon. Thus, the inauguration of the Alien board causes an immediate positive effect on firm investment rate.

The result on Table 11 shows the t-test for whether there is a significant change in firm cost of capital following each stock market liberalization year in four main periods as for the firm investment rate. When the period of study is all years before and all years after the stock market liberalization, the firm cost of capital significantly declines following the 1985 and 1987 stock market liberalizations. The reductions in firm cost of capital are 44.35% and 43.54% respectively after the 1985 and 1987 liberalizations. The

firm cost of capital also significantly declines following the 1985 and 1987 stock market liberalization when time interval is 5 years before and 5 years after, 3 years before and 3 years after, and 1 year before and 1 year after liberalization. Therefore, the significant reduction in firm cost of capital following the 1987 liberalization is consistent with the International Asset Pricing model. Since the cost of capital reduces, the investment is expected to rise following the liberalization.

B.1. The During, Post, and After Effects of 1985 and 1987 Stock Market Liberalization on Firm Investment

From a sample of 11 countries that liberalized their stock markets, Henry (2000a) finds 9 countries experience a growth rate in private investment above their non liberalization median in the first year after liberalizing. In the second and third years, this number is 10 of 11 and 8 of 11, respectively. Henry argues that the stock market liberalization increases private investment. In addition, Chari and Henry (2005) find that the growth rate of the firm investment exceeds its pre-liberalization mean by an average of 5.4% in the three-year period following stock market liberalization. Therefore, according to the International Asset Pricing model, the firm cost of capital should decline and I expect the firm investment to rise following the liberalization.

In order to find the movement of the firm investment in the pre, during, post, and after periods of the stock market liberalization, I plot the mean value of the firm investment rate when the liberalization year changes. The results are in Figure 11. Real growth rate of firm property plant and equipment as a proxy for firm investment rate falls

from the pre-liberalization level during the 1985 stock market liberalization. Firm investment rate increases from the pre-liberalization level during the 1987 stock market liberalization. Firm investment rate then increases steeply from the pre-liberalization level in the post 1985 and 1987 stock market liberalization. The firm investment rate, despite falling sharply from the post 1987 stock market liberalization level, is still higher than pre-1987 stock market liberalization level in the after-1987 stock market liberalization period. The firm investment rate is slightly higher than the pre-liberalization level in the after period of the 1985 stock market liberalization.

In order to find the pre, during, post, and after effect of the 1985 and 1987 stock market liberalization on firm investment rate, I use the following the models. The main concentration is on the effect of the 1987 stock market liberalization on firm investment rate.

$$REALG\_PPE_{it} = FIRM_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi_4 LIBAF + \Theta_4 D97 + e_{it} \quad (20a)$$

$$REALG\_PPE_{it} = SECTOR_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi_4 LIBAF + \Theta_4 D97 + e_{it} \quad (20b)$$

REALG_PPE is the real growth rate of firm property plant and equipment used to measure the firm investment rate. The consistent standard error is used since the heteroskedastic problem exists. The fixed effect estimation results are in Table 13. Two datasets are used in the estimation. The first dataset is the whole dataset and the second dataset includes only the firms that have observation before and after 1987. In estimating the model, I control for firm differences and sector differences since those factors might affect the differences in firm investment rate. When the firm differences are controlled,

the Hausman specification test picks the fixed effect estimation over the panel-generalized least squares. When the sector differences are controlled, the Hausman specification test shows that either estimation method can be used. Therefore, I present the results of the fixed effect estimation in Table 13. When the firm specific fixed effect estimation is used as the estimation method, the firm investment rate significantly increases from the pre-liberalization level in the LIB0, POSTLIB, and LIBAF periods of the 1987 liberalization regardless of which dataset is used. The largest increase in firm investment rate is in the LIBAF period. The result of the sector specific fixed effect estimation also shows that the firm investment rate significantly increases from the pre-liberalization level in the LIB0, POSTLIB and LIBAF periods of the 1987 liberalization. Therefore, the inauguration of the Alien board positively affects the firm investment rate in all three periods of the 1987 liberalization.

Next, I include the control variables to see whether the liberalization effects are different when control variables are included.

$$REALG\_PPE_{it} = FIRM_i + \lambda_1 DIV_{it-1} + \lambda_2 G\_SALES_{it} + \lambda_3 LNTA_{it-1} + \delta PRELIB + \theta_1 LIB0 + \theta_2 POSTLIB + \theta_3 LIBAF + \Theta_4 D97 + e_{it} \quad (21a)$$

$$REALG\_PPE_{it} = SECTOR_i + \lambda_1 DIV_{it-1} + \lambda_2 G\_SALES_{it} + \lambda_3 LNTA_{it-1} + \delta PRELIB + \theta_1 LIB0 + \theta_2 POSTLIB1 + \theta_3 LIBAF + \Theta_4 D97 + e_{it} \quad (21b)$$

G_SALES is the growth rate of firm sales used to capture the growth rate of the firm future cash flow. LNTA is log of firm total asset used to capture the firm size. DIV is the firm dividend yield to capture for the cost of capital. Two main datasets are used in estimating equation (21) to determine whether the liberalization effect is different when

the model is estimated with a smaller dataset. The fixed effect estimation with consistent standard error results are in Table 13. The International Asset Pricing model also predicts that the cost of capital should decline following the liberalization because risk is diversified. Therefore, if the International Asset Pricing is true, I should observe an increase in firm investment rate compared to the pre-liberalization level following the stock market liberalization.

The fixed effect estimation with consistent standard error shows that the firm investment rate negatively relates to the cost of capital and positive relates to growth rate of firm future cash flow. However, the effect of firm cost of capital and growth rate of firm future cash flow are not statistically significant when whole sample dataset is used. When the sub-sample dataset is used, the firm investment rate positively relates to growth rate of firm future cash flow. The positive relation between firm investment and growth rate of firm future cash flow is consistent with the study of Chari and Henry (2005). The firm specific fixed effect estimations using either whole sample or sub-sample dataset show that the firm investment rate negatively relates to firm size. That is, larger firm size negatively affects the firm investment rate. The negative relationship between firm size and firm investment rate due to larger firms normally have lower growth opportunity while smaller firms normally have higher growth opportunity. Therefore, firm that has larger size might have lower investment rate. When sector differences are controlled, the positive effect of the growth rate of firm future cash flow on firm investment rate is only statistically significant when sub-sample dataset is used. When sector differences are controlled and whole sample dataset is used, the larger firm size positively affects the firm investment rate. However, the statistically significant level is not highly significant

compared to when firm differences are controlled. The firm size does not affect the firm investment rate when sub sample dataset is used in sector fixed effect estimation.

When the control variables are included, the LIB0 effect of the 1987 liberalization is no longer statistically significant whether the firm or sector differences are controlled or which dataset is used. Both firm and sector specific fixed effect estimation shows that the firm investment rate significantly increases from the pre-liberalization level in the POSTLIB and LIBAF periods of the 1987 stock market liberalization. Therefore, the firm investment rate significantly increases especially in one and two years following the 1987 liberalization.

The fixed effect estimation results using the 1985 as the stock market liberalization year is on Table 12. The sub-sample dataset is changed to the one that includes only the firms that have observation before and after 1985. When estimating equation (20), both firm and sector specific fixed effect estimation using either whole or sub-sample dataset shows that the firm investment rate declines from the pre-liberalization level in the LIB0 period of the 1985 stock market liberalization. However, when control variables are included, the LIB0 effect is no longer statistically significant regardless of whether firm or sector differences are controlled. The fixed effect estimation results using either dataset shows that the firm investment rate significantly higher than the pre-liberalization level in the LIBAF period of the 1985 stock market liberalization. The 1985 stock market liberalization does not have immediate effect on firm investment rate when control variables are included.

Therefore, the inauguration of the Alien board in 1987 positively affects the firm investment rate especially in the POSTLIB period of the 1987 liberalization. The higher

investment rate following the 1987 stock market liberalization is consistent with the International Asset Pricing model, which predicts that the cost of capita should decline following the liberalization. As the cost of capital declines, the firm investment rate should rise following the liberalization. On the contrary, the introduction of the first Thailand funds in 1985 negatively affects the firm investment rate during the 1985 liberalization takes place.

B.2. The During, Post, and After Effects of the 1985 and 1987 Stock Market Liberalization on Firm Cost of Capital

According to the International Asset Pricing model under capital market segmentation, the firm cost of capital should decline following stock market liberalization. Table 11 shows a significant reduction in the mean value of the cost of capital following the 1985 and 1987 liberalization regardless of which time interval is Figure 12 shows that the cost of capital both declines from the pre-liberalization level during the period of the 1985 and 1987 stock market liberalization. The cost of capital continues to decrease from the pre-liberalization level in the POSTLIB period of the 1985 stock market liberalization. The cost of capital increases slightly from the LIB0 level in the POSTLIB period of the 1987 liberalization. However, the POSTLIB value of the cost of capital following the 1987 liberalization is still lower than the pre-liberalization level. The LIBAF value of the cost of capital following both 1985 and 1987 liberalization seems to be lower than the pre-liberalization level. The reduction in the cost of capital following the 1985 and 1987 liberalization is consistent with the the International Asset Pricing model prediction.

To evaluate the effect of the 1987 stock market liberalization on the cost of capital, I use the following model.

$$DIV_{it} = FIRM_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (22a)$$

$$DIV_{it} = SECTOR_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (22b)$$

DIV is firm dividend yield to proxy for firm cost of capital. The Hausman Specification test picks the fixed effect estimation over the panel generalized least squares regardless of which dataset is used and whether firm or sector differences are controlled. The fixed effect estimation results are in Table 15. Both firm and sector specific fixed effect estimation shows that the firm cost of capital significantly declines from the pre-liberalization level in the LIB0, POSTLIB, and LIBAF period following the 1987 stock market liberalization. The magnitude of a reduction in the cost of capital is largest in the LIB0 period. The reduction in firm cost of capital is consistent with the International Asset Pricing model prediction. In addition, the reduction in cost of capital in the LIB0, POSTLIB, and LIBAF period is also consistent with the results in Table 13, which shows a significant increase in the firm investment rate in the same periods.

Next, I add the control variables to see whether the liberalization effects on the firm cost of capital are different.

$$DIV_{it} = FIRM_i + \Theta_1 LNTA_{it} + \Theta_2 G\_EPS_{it} + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (23a)$$

$$DIV_{it} = SECTOR_i + \Theta_1 LNTA_{it} + \Theta_2 G\_EPS_{it} + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (23b)$$

The cost of capital is a function of firm size and growth rate of firm earning per share. When firm differences are controlled, the Hausman specification test picks the fixed effect estimation over the panel-generalized least squares. The fixed effect estimation results are in Table 15. The firm specific fixed effect estimation using either dataset show that the cost of capital increases when firm size is smaller. However, when sector differences are controlled, the firm cost of capital positively relates to firm size. The positive effect of firm size and firm cost of capital might be due to larger firm paying higher dividend because larger firm has lower growth opportunity. The effect of the firm growth rate of earning per share is only statistically significant when sub-sample dataset is used. The firm specific fixed effect estimation and the sector specific fixed effect estimation using sub-sample dataset both shows that the cost of capital declines when firm growth rate of earning per share rises. Since the cost of capital is composed of dividend yield plus growth rate of earning per share. If the cost of capital is fixed, an increase in growth rate of earning per share should reduce dividend yield. Since net income is used to pay dividends or keep as retained earning for the investment, when the retained earning rises, this implies more investment and higher growth rate of net income. When retained earning rises, firm dividend yield should decline. The inclusion of the control variables in the equation does not affect the 1987 liberalization effects of the cost of capital. The 1987 liberalization reduces the cost of capital from the liberalization level in LIB0, POSTLIB, and LIBAF period of the 1987 liberalization.

When 1985 is used as the stock market liberalization year, the LIB0 effect of the 1985 liberalization on firm cost of capital is still negative but no longer statistically significant. The fixed effect estimation results using either whole dataset or sub-sample

dataset that contains only the firms that have observation before and after 1985 shows that the cost of capital significantly declines from the pre-liberalization level in both POSTLIB and LIBAF period. Therefore, the effects of the 1985 and 1987 stock market liberalization on the cost of capital is consistent with the prediction of the International Asset Pricing model that the cost of capital should declines following the liberalization. The inauguration of the Alien board in 1987 seems to have stronger effect on cost of capital since the cost of capital significantly declines in all three periods of the 1987 liberalization.

C. The Effect of Stock Market Liberalization on Firm Performance

The effect of stock market liberalization on firm performance is measured using Tobin's Q. According to Bharadwaj, Bharadwaj, and Konsynski (1999), Tobin's Q is a better measure of firm performance in terms of future profitability than standard accounting measures. Tobin's Q is a ratio of the asset market value of capital goods divided by replacement cost. Following Chari and Henry (2005), I calculate Tobin's Q as the sum of the market value of equity and the book value of debt all divided by the book value of total assets. The market value of equity is firm stock price multiplied by the firm number of shares traded, which is the firm market capitalization. The book value of debt is book value of the total liability. According to the International Asset Pricing model, stock market liberalization will cause a reduction in the cost of capital and thereby cause the stock price to increase. Therefore, the Tobin's Q value should rise following the stock market liberalization. Figure 13 shows the movement of the mean value of Tobin's Q from 1976 to 2003. As shown in Figure 13, the mean value of Tobin's Q

reaches the highest level in 1989, which is two years after the 1987 stock market liberalization. After 1989, the firm performance declines sharply and picks up again after 1992. The firm performance declines sharply after 1993 and reaches the lowest level around 1997, the year of Thailand's financial crisis, to 2000. The firm performance picks up after 2000.

In order to see the behavior of firm performance before and after the liberalization year, I conduct a t-test to identify whether there are significant changes in firm performance following the 1985 and 1987 stock market liberalizations. I identify the significant changes in firm performance under four main scenarios: all years before and all years after liberalization, five years before and five years after liberalization, three years before and three years after liberalization, and one year before and one year after the liberalization. The results are in Table 16.

The t-test of significant changes in the mean value of firm performance as measured by Tobin's Q shows that there are significant improvements in firm performance following the 1985 and 1987 stock market liberalizations. The results show that firm performance significantly improves following the 1985 and 1987 stock market liberalizations over all years before and all years after, 5 years before and 5 years after, and 3 years before and 3 years after liberalization. When time interval is one year before and one year after the liberalization, the firm performance significantly improves following the 1987 liberalization. An improvement in firm performance in one year before and one year after 1985 liberalization is not statistically significant.

A significant improvement in firm performance as measured by Tobin's Q following the 1985 and 1987 stock market liberalizations is consistent with Chari and

Henry's (2005) findings since they find Tobin's Q increases during the liberalization. A significant improvement in firm performance following the 1985 and 1987 stock market liberalization over the 5 years before and 5 years after liberalization and the 3 years before and 3 years after liberalization also occurs when the ROA is used as the measure of firm performance. The significant change in firm performance as measured by the ROA is illustrated in Table 17.

In order to identify whether firms in the Stock Exchange of Thailand generate wasteful investments following each stock market liberalization year that might cause a reduction in firm performance, I divide firm net income by firm property plant and equipment to generate the firm's rate of return on investment (NIPPE). Then I take the average NIPPE for all firms to generate the mean value of firm rate of return on investment. According to Chari and Henry (2005), if the rate of return on investment is higher in the post liberalization period, we cannot conclude that liberalization stimulates wasteful investment. Figure 16 shows the mean value of firm rate of return on investment from 1976 to 2003. Figure 16 shows that the mean value of firm rate of return on investment significantly increases during the 1985 and slightly increase during 1987. To see the movement of the mean value of firm rate of return on investment in various scenarios, I calculate the mean value of firm rate of return on investment following each stock market liberalization year in Table 18. The first scenario is all years before and after each stock market liberalization year. The results show that the firm rate of return on investment significantly falls following the 1985 and 1987 liberalization under the first scenario. The changes in firm rate of return on investment are not statistically significant under other scenarios. However, though the changes in firm rate

of return are not statistically significant, the firm rate of return increases following the 1985 liberalization under 3 years before and 3 years after liberalization and increases following the 1987 liberalization under 1 year before and 1 year after liberalization.

Haksar and Kongsamut (2003) found that a high level of debt, in other words, high leverage is correlated with poor performance. I use the debt to equity ratio to measure company financial leverage. Firm debt to equity ratio is calculated as firm total liabilities divided by firm total equity. A debt to equity ratio reveals the extent to which firm management is willing to fund its operations with debt rather than its equity. A high debt to equity ratio generally implies that a firm has been aggressive in financing its growth with debt. A firm that has a high debt to equity ratio is at risk for bankruptcy and has a high chance of becoming insolvent. According to Haksar and Kongsamut (2003), high leverage could reflect poor corporate governance and expose firms to risk in the event of economic volatility. Figure 18 shows that the mean value of debt to equity ratio declines after the 1985 and reaches the second lowest value in 1987. Table 19 shows the significant change in firm debt to equity ratio under four main scenarios. It shows that significant changes in firm debt to equity ratio occurs only when the time horizon is all years before and all years after and five years before and five years after liberalization. Under the all years before and all years after liberalization, the firm debt to equity ratio significant declines from the pre-liberalization level in both liberalization years. Liberalization year 1987 has the largest significant reduction in firm debt to equity ratio. Figures 19 and 20 show the average post 1985 and 1987 debt to equity ratio compared to pre-liberalization ratios calculated over year -3 to -1 where year 0 is liberalization.

Figures 19 and 20 show that the firm debt to equity ratio is much lower than the pre-liberalization level for 1985 and 1987.

C.1. The During, Post, and After Effects of 1985 and 1987 Stock Market Liberalization on Firm Performance

International Asset Pricing Model predicts a reduction in firm cost of capital and increase in firm share price following the liberalization, therefore, Tobin's Q value should rise following the liberalization. In order to find the pre, during, post, and after effects of the 1985, and 1987 stock market liberalizations, I plot the movement of mean value of firm performance in Figure 21. Figure 21 shows that the mean value of firm performance does not change much when the 1985 stock market liberalization takes place. The mean value of firm performance is higher than the pre-liberalization level in both post and after periods of 1985 stock market liberalization. When the year of liberalization is 1987, the mean value of firm performance improves sharply when the liberalization takes place. Then the mean value of firm performance declines from the during liberalization level in both post and after liberalization periods. However, the mean value of firm performance in both post and after liberalization periods is still higher than the pre-liberalization level.

Figure 22 shows the movement of the mean value of firm performance as measure by ROA. The firm performance improves significantly during the 1987 liberalization and continues to improve in the post-liberalization period. The firm performance falls in the after-liberalization period but the after-liberalization value is still higher than the pre-liberalization value. The movement of the firm performance as

measured by ROA following the 1985 liberalization is similar to the movement of firm performance as measured by Tobin's Q.

Since the above results simply describe the behavior of the firm performance as measured by Tobin's Q without control for firm and sector differences that might drive up the differences in Tobin's Q value, I first measure firm performance using the following equation.

$$TOBINQ_{it} = FIRM_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (25a)$$

$$TOBINQ_{it} = SECTOR_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (25b)$$

TOBINQ is used to measure firm performance. Year 1987 is used as the stock market liberalization year. Whole sample and sub-sample datasets are used in the estimation. The Hausman Specification test picks the fixed effect estimation over the panel generalized least square regardless of which dataset is used. The results of the fixed effect estimation are in Table 22. The firm specific fixed effect estimation using either dataset shows a significant improvement in firm performance in the LIB0, POSTLIB and LIBAF periods. The sector specific fixed effect estimation shows that the firm performance significantly improves from the pre-liberalization level in all periods regardless of which dataset is used.

Then I add control variables to identify whether the liberalization effects of the 1987 liberalization are different.

$$TOBINQ_{it} = FIRM_i + \tau_1 MKTSHARE_{it} + \tau_2 DEBTEQ_{it} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (26a)$$

$$TOBINQ_{it} = SECTOR_i + \tau_1 MKTSHARE_{it} + \tau_2 DEBTEQ_{it} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (26b)$$

Firm performance is a function of firm market share, firm debt to equity ratio, firm size, and liberalization dummy variables. Haksar and Kongsamut (2003) found that a larger market share is associated with stronger firm performance while a high debt to equity ratio is associated with poor performance. Therefore, I expect a positive relationship between firm market share and firm Tobin's Q and expect a negative relationship between firm debt to equity ratio and firm Tobin's Q. The fixed effect estimation with consistent standard error is in Table 22. The firm and sector specific fixed effect estimation and using either dataset show that the firm performance positively relates to firm market share. That is larger market share improves firm performance. However, the coefficient of the market share is not statistically significant when firm differences are controlled. When the whole sample dataset is used and firm differences are controlled, the firm performance is negatively related to firm size. However, when sub-sample dataset is used, firm performance is positively related to firm size. When sector differences are controlled and sub-sample dataset is used, firm performance is positively related to firm size. Since the results of both firm specific and sector specific using sub sample dataset both shows the positive statistic relation between firm size and firm Tobin's Q, I use the results of the sub-sample dataset and conclude that larger firms have higher Tobin's Q. An inclusion of the control variables does not affect the significance of the liberalization effects in LIB0, POSTLIB, and LIBAF periods. That is, firm performance sill significantly improves in LIB0, POSTLIB, and LIBAF periods of the 1987 liberalization regardless of which dataset is used or whether the firm or sector

differences are controlled. Therefore, the firm performance significantly improves following the 1987 liberalization when Tobin's Q is used as a proxy of firm performance.

When I change the liberalization year to be 1985, the liberalization effects change slightly. The fixed effect estimation results are in Table 20. When liberalization years is 1985, the firm performance as measured by Tobin's Q significantly improves only in POSTLIB and LIBAF period. The LIB0 effect is still positive but no longer statistically significant when sector differences are controlled. Therefore, the firm performance significantly improves in the POSTLIB and LIBAF periods following the 1985 stock market liberalization.

Next, I use ROA as a measure of firm performance to identify whether the liberalization effects are different.

$$ROA_{it} = FIRM_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \qquad (27a)$$

$$ROA_{it} = SECTOR_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \qquad (27b)$$

The liberalization year is 1987. The Hausman Specification test picks the fixed effect estimation over the panel generalized least square estimation. The fixed effect estimation with consistent standard error is in Table 23. When firm differences are controlled, the firm performance, as measured by ROA, significantly improves in LIB0, POSTLIB, and LIBAF periods of the 1987 liberalization. The sector specific fixed effect estimation also finds the same results. Then I add control variables to identify whether the liberalization effects are different.

$$ROA_{it} = FIRM_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \qquad (28a)$$

$$ROA_{it} = SECTOR_i + \tau_1 MKTSHARE_{it-1} + \tau_2 \ DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (28b)$$

Firm performance as measured by ROA is a function of firm market share, firm debt to equity last period, firm size, and liberalization dummy variables. The fixed effect estimation results are in Table 23. The firm performance is positively related to firm market share and firm size. That is, a larger firm has better firm performance. A larger firm has higher net income because they can generate higher sales and therefore has better firm performance as measured by ROA. In addition, the firm that has larger market share also has better firm performance. The relationship between ROA and firm leverage is negative but not statistically significant. When control variables are included, the liberalization effects do not change. That is, firm performance significantly improves from pre-liberalization level in LIB0, POSTLIB, and LIBAF periods of the 1987 liberalization.

Table 21 shows the fixed effect estimation results when liberalization year is changed to 1985 and ROA is used as a measure of firm performance, the estimation results without the control variables show that the firm performance significantly improves from the pre-liberalization level in the POSTLIB and LIBAF period of the 1985 liberalization. When control variables are included, the firm specific fixed effect estimation and sector specific fixed effect estimation show that the firm performance significantly improves in the POSTLIB and LIBAF periods of 1985 liberalization.

In conclusion, the effect of the stock market liberalization on firm performance is similar whether the ROA or Tobin's Q is used to measure firm performance. That is, firm performance significantly improves following the 1985 and 1987 stock market

liberalization. The improvement in firm performance is much stronger when liberalization year is 1987 since the firm performance improves immediately during the 1987 liberalization. The during effect is not statistically significant when liberalization year is 1985. . Therefore, the inauguration of the Alien board in 1987 causes a large positive impact on firm performance.

CHAPTER VI

SUMMARY

Stock market liberalization is a decision by country to allow foreign investors to participate in its stock market through buying and selling shares. Stock market liberalization is one form of financial and capital account liberalization. Many people have cast doubt on the benefits of stock market liberalization. Using annual firm level data, this study tries to identify the effects of stock market liberalization in Thailand in three main areas: the effect on the firm stock return in the Main and Alien boards; the effect on firm investment rate and firm cost of capital; and lastly the effect on firm performance. The total number of firms in this study is 469 firms in 31 sectors in the Stock Exchange of Thailand (SET). The period of study is from 1976 to 2003. Using firm level data instead of country level data allows to see how the firms in the Stock Exchange of Thailand are affected by the country's decision to liberalize the stock market. Since stock market liberalization is a gradual process, I concentrate on three years that had significant changes in liberalization policies; 1985 and 1987 in evaluating the effect of the liberalization on firm Main board revaluation, firm investment and firm cost of capital and firm performance, and 1991 in evaluating the effect of liberalization on firm Alien board revaluation.

The first effect of the stock market liberalization is the revaluation effect on firm stock return, composed of firm Main board stock return and firm Alien board stock

return. The Alien board was inaugurated in 1987 in addition to the Main board to facilitate foreign investment in the Stock Exchange of Thailand. According to the International Asset Pricing Model (IAPMs), the cost of capital will fall following the stock market liberalization. That is, holding the expected future cash flow constant, the liberalizing countries should observe an increase in equity price index following the stock market liberalization. To find whether the firm Main board share stock return increases following the 1985 and 1987 stock market liberalization, I estimate models by first controlling for firm differences and then for sector differences since those factors might affect revaluation among firms. The firm Main board stock return is negatively related to firm size and firm growth rate, but positively related to firm stock liquidity and world stock return. The estimation results show that the firm Main board stock return falls during liberalization, but rise in the post-liberalization period and falls again in the after-liberalization period following the 1985 stock market liberalization.

When the liberalization year is 1987, the firm Main board stock return is significantly higher than the pre-liberalization level during the 1987 stock market liberalization. The firm Main board stock return is significantly lower than the pre-liberalization level in the post and after-period of the 1987 stock market liberalization. A change in firm size in during, post, and after periods of the 1987 stock market liberalization does not affect the revaluation effect of the firm Main board stock return. Therefore, the inauguration of the Alien board in 1987 has immediate positive impact on the firm Main board stock return during the 1987 stock market liberalization takes place and negatively impact later on.

Since the Alien board share price started to appear in the Stock Exchange of Thailand in 1988, 1991 is the only liberalization year used in identifying the effect of stock market liberalization on firm Alien board stock return. The immediate effect of the 1991 liberalization on firm Alien board stock return is negative, that is, the firm Alien board stock return declines from the pre-liberalization level following the 1991 liberalization. However, the firm Alien board stock return increases from the pre-liberalization level in the post-liberalization period. A change in firm size for the during, post, and after period does not affect the firm Alien board stock return. When sector differences are controlled, the firm Alien board stock return significantly declines from the pre-liberalization level during the 1991 liberalization regardless of which estimation models are used. Since local investors normally trade shares through the Main board while foreign investors normally trades shares through the Alien board, the differing ability to use the information available between local and foreign investors might be a reason for the different revaluation effects between the two boards following the stock market liberalization.

In addition to the revaluation effect of the stock market liberalization on firm stock return, I evaluate the effect of the 1985 and 1987 stock market liberalization on firm investment rate and firm cost of capital. Larger firm size negatively affects firm investment rate when firm differences are controlled. The firm investment rate is negatively related to the cost of capital but the relationship is not statistically significant. When a sub-sample dataset is used, the firm investment rate is positively related to the growth rate of firm future cash flow. That is, the firm that has higher growth rate of future cash flows will have a higher investment rate. The 1985 stock market

liberalization negatively affects the firm investment rate since the firm investment rate significantly declines from the pre-liberalization level during the 1985 stock market liberalization. When control variables are included in the estimation, the 1985 stock market liberalization positively affects the firm investment rate in the after-period.The 1987 stock market liberalization affects the firm investment rate differently. The firm investment rate significantly increases from the pre-liberalization level in the during, post, and after-periods of the 1987 stock market liberalization. When control variables are included in the estimation, the during effect is still positive but no longer statistically significant. However, the firm investment rate still significantly improves from the pre-liberalization level in the post and after 1987 periods. The increase in firm investment rate following the liberalization is consistent with the International Asset Pricing model that predicts a fall in firm cost of capital following the liberalization. As the cost of capital falls following the liberalization, the investment is expected to rise. Between the two liberalization events, the inauguration of the Alien board has the stronger immediate positive impact on firm investment rate following the liberalization.

The firm cost of capital immediately declines from the pre-liberalization level following the 1985 and 1987 liberalizations regardless of which pre-liberalization period is used. The effect of the 1987 stock market liberalization on firm cost of capital is stronger than the effect of the 1985 liberalization since the firm cost of capital declines from the pre-liberalization level in the during-liberalization period in addition to the post and after-liberalization periods. This confirms that the inauguration of the Alien board in 1987 is the major liberalization event since the firm cost of capital immediately declines and investment rate rises following the liberalization.

Both Tobin's Q and ROA are used as proxies for firm performance when evaluating the effect of stock market liberalization on firm performance. The firm performance as proxied by Tobin's Q is positively related to firm market share. The effect of firm size on firm performance depends on whether the whole sample or the sub-sample dataset is used. Firm performance as measured by ROA is positively related to firm market share and firm size. That is a firm that has higher market share and a larger firm will have better performance. Firm performance significantly improves from the pre-liberalization level following the 1985 and 1987 liberalizations. The improvement in firm performance is larger when Tobin's Q is used as a proxy of firm performance. When liberalization year is 1985, the firm performance significantly improves from the pre-liberalization level in the post and after-period of stock market liberalization regardless of which firm performance proxy is used. The during-effect of the 1985 stock market liberalization on firm performance is not statistically significant.

When liberalization year is 1987, the improvement in firm performance following the liberalization is much stronger. The firm performance immediately improves from the pre-liberalization level during the 1987 stock market liberalization period regardless of which firm performance proxy is used. The firm performance significantly improves from the pre-liberalization level in during, post, and after liberalization period regardless of firm performance proxy is used. Therefore, the inauguration of the Alien board in 1987 has a positive effect on firm performance.

The analysis of the effect of stock market liberalization on firm stock return, firm investment/ firm cost of capital, and firm performance would be clearer if monthly firm level data were used since the announcements of certain liberalizations policies occurred

in certain months as shown in Table 1. However, because monthly firm level data and even quarterly firm level data are not available for the early years, it is only possible to use annual firm level data in analyzing the effects of the stock market liberalization. The effect of stock market liberalization in Thailand can also be further analyzed to see the effect of liberalization in each sector in addition to the overall effects to see how each sector is affected by the country's decision to liberalize the stock market.

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APPENDIXES

APPENDIX A

Table 1
Thailand Official Stock Market Liberalization
Dates and Policies to Promote Foreign Investment

Date	Details about liberalization and policies
April 1975	The Securities Exchange of Thailand (old SET) was established
April 1977	Foreign Promotion Act, guarantees that no private business will be nationalized. Tax exemptions are granted for three to eight years, as are tariff exemptions and reduction in income taxes. Free repatriation of profits and dividends.
1980	Interest rate ceilings for financial institutions from 15 percent limit imposed by usury law.
August 1981	The tax holding for interest payment on foreign loans. Originally scheduled to end on September 30, 81 and to apply only to loans with an original maturity exceeding 12 months, was extended until the end of the year and to cover loans of all maturities.
September 1981	The Exchange Equalization fund introduced a forward exchange over facility for U.S. dollar funds borrowed abroad by the commercial banks and their customers; the facility provided coverage for three months, with a premium of Baht 0.04 per US$ 1 for forward sales.
1983	Board of Investments criteria were changed to facilitate export-oriented investment. While new criteria require majority local ownership for firms producing in the domestic market, they permit majority foreign ownership of export-oriented firms; plants whose output is wholly exports are permitted to be owned 100 percent by foreigners
1983	Banking crisis; 15 % of banks asset were non-performing. Causes; oil shock in 1979/80, deficient bank management, short-comings in regulatory and accounting framework as will as inadequate supervision. Overall change in macro policies: devaluation of exchange rate and tight fiscal and monetary policy.
January 1983	The exemption from the withholding tax on interest payments on foreign loans, originally scheduled to end at Dec 31, 1982, was extended to June 30, 1983 for loans with maturities of more than 12 months.

July 1983	The above exemption form the withholding tax further extended to June 30, 1984, but only for foreign loans with maturities of more than 24 months
September 1983	Special government bonds bearing 5% interest rate and with a 10 year maturities were issued for a period up to the end of fiscal year 1983 in Baht 1 million denominations in an amount not exceeding Baht 100 millions; they were offered for subscription to foreign investors intending to invest and reside in Thailand.
1984	Thailand abandons fixed exchange rate vis-à-vis the dollar. General credit restrictions abolished but restrictions on bank lending rates are re-imposed. Ceilings for loans to priority sectors lowered.
1984	The introduction of the Insider Trading Laws
June 1984	The exemption form the withholding tax granted to interest payments on foreign loans with maturities of more than 24 months was terminated
1985	IMF standby credit.
May 1985	All private foreign borrowing at the Bank of Thailand was required to register within seven days of the signature date, and not after the loan funds were imposed and sold to authorized banks.
July 1985	**Bangkok Fund Ltd launched on the London Stock Exchange with net asset value of $163.5 million (in December 1991)**
1986	SET policies to promote foreign investment: 1. SET sought the co-operation form the Bank of Thailand (BOT) to relax remittance procedures to foreign investors in repatriating their invested funds to their own countries. The BOT consequently allowed foreign investors to repatriate their invested funds at any TIME after being confirmed by member firms of the SET. 2. Printed Matters and videotapes on securities market and data for distribution to foreign investors were produced. 3. Co-ordination was sought from various government agencies, namely the Ministry of Foreign Affairs, the Tourism Authority of Thailand, etc., in spreading the information and understanding of securities investment in Thailand to foreign investors.
April 1986	The government announced the income tax rate decrease for foreign investors in the on-shore foreign investment fund as follows: Dividend tax—On juristic investor, down from 20% to 10 % On individual investor, down from the range of 7-55% to 7-10% Capital gain tax—On juristic investor, down form 25% to 12.5% On individual investor, tax-free
December 1986	**The Thailand Fund**, the first on-shore international mutual Fund approved by the BOT for mobilizing funds from abroad to be invested in Thai capital market, was officially launched with the initial value of US$ 30 million. The fund was launched by Morgan Stanley.
July 1987	ASEAN free trade agreement extended.
September 1987	**SET promote greater foreign investment by launching the "Alien Board" which is the special board for trading securities held by foreigners to ensure confidence in securities transfer.**

September 1987	Bekaert/ Harvey Official Liberalization date (Final Version)
1988	SET attempt at encouraging foreign investors to invest more fund in equities instead of giving loans with a view to raising the volume of securities transaction by foreign investors to 32000 million baht or 10 percent of total trading on SET
January 1988	Thailand official liberalization date according to Henry (2000). Country Fund Introduction: The Siam Fund Limited (from Henry (2000) paper). According to Henry (2000), there are restrictions on capital transaction using resident owned funds and restrictions on domestic residents' ability to own foreign securities.
August 1988	Kim and Singal Liberalization date
December 1988	Bakeart and Harvey Official Liberalization date (NBER version)
December 1988	Ceiling on foreign borrowing were raised.
1989	Attempt to encourage foreign investors to invest long-term funds in equities by targeting foreign investors holding 30 percent of total market value.
1989	Abolished deposit rate ceiling on commercial bank TIME deposits greater than
March 1989	The U.K. Department of Trade and Industry had added the Securities Exchange of Thailand to the list of markets approved under the regulations, which governed the investments of unit trusts (mutual funds) authorized in the United Kingdom. The principal effect of this approval was that a British registered Unit Trust was faced with no restrictions in investing its funds in the SET
July 1989	The BOT had issued a new rule that authorized commercial banks to administer and permit outward remittances of dividends foreign investors received from Thai companies if they had already submitted relevant documents as required by the rule and also governed the export of shares of certificates.
December 1989	The BOT had further changed its regulation on foreign exchange control to allow foreign investors who registered their inward fund with the BOT to remit the earnings, including capital gains from sale of their shares, directed through commercial banks without the prior approval of the BOT on the condition that sufficient documents should be submitted to the BOT later on.
January 1990	Allowance of dual prices quotation: the SET Board of Director had agreed to allow quoted and pre-quoted companies offering their shares to the public to adopt a dual prices policy through which their share prices might be fixed at two levels for sales to foreign and local investors. This regulation would make the company wishing to earn more premiums by selling their shares in the foreign market. Normally, foreign investors would buy shares of the companies that satisfied conditions concerning foreign shareholder limitation ceilings on the alien board, which had higher prices than the main board because of the higher demand. The ceiling of foreign share-ownerships were 49 percent for general companies and 25 percent for financial institutions but the level could be varied by approval of the Board of Investment or other authorities concerned.
January 1990	Domestic firms no longer need to get approval to pay dividend to foreigners.
March 1990	Ceiling on loan rates were raised

May 1990	Thai citizens gain access to foreign bank account.
May 1990	Announcement of Liberalization from the BOT: the Ministry of Finance and the Bank of Thailand announced new measures to liberalize financial system as follows: 1. Announcement to comply with Article 8 of the International Monetary Fund (IMF) Agreement which dismantled restrictions on current international payments and to avoid discriminations in currency practices to other members of IMF and to apply only one exchange rate for international business 2. The relaxation of foreign exchange controls was to facilitate foreign exchange settlements, which would help sustain long-term economic development of the country. 3. Thailand had changed its status from a debitor to a creditor country of the IMF by repaying all remaining debts to the IMF. The repayment would be made before the due date.
June 1990	The SET had applied to be a member of FIBV or Federal International des Bourses de Valeurs. FIBV will select high quality Stock Exchange all around the world to be member. The privilege of the members of this organization was the remittance the capital funds from the members own countries to invest in other member Stock Exchange without approval from any institutions. The FIBV approved the SET to be a permanent member in September 1990.
November 1990	The second step to ease foreign exchange: the BOT approved the second step to relax the foreign exchange control. This measure was to provide facility for remittances in and out and to reduce cost of exchange. The details were as follows: 1. An individual was allowed to open his or her own account abroad but the total amount should not exceed US$500,000. 2. A juristic person was allowed to open its own account abroad but the total amount should not exceed US$500,000.
1991	The bank of Thailand announced the deregulation of foreign exchange phrases II effective on April 1, 1991 as followed. 1. The benefit of investment on securities comprising capital gains, dividends and share certificates could freely be remitted and sent to overseas 2. Simplifying recipients Exchange Control form (EC) and reducing the number of evidences 3. Abolishing the registration of capital inflow for investment 4. Allowing the opening of foreign currencies bank accounts with no restrictions concerning currencies, accounting types and interest rates. However, the size of accounts should comply with the following; -individual investor not exceeding U.S$500,000 -juristic investor not exceeding U.S$500,000
January 1991	**First ADR announced**
April 1991	Announcement of the loosing of foreign exchange controls and the introduction of the value added tax system in January of 1992. Controls and reporting requirements for the repatriation of dividends, capital gains, foreign currencies, and share certificates were partially removed.
April 1991	ADR effective date. (Company = Asia Fiber Company limited, Exchange = OTC)

1992	The cabinet approved the establishment of the BIBF on September 8, 1992
1992	Ceiling on loan rates were removed.
May 1992	Controls and reporting requirements for the repatriation of dividends, capital gains, foreign currencies, and share certificates continued to be partially removed
May 1992	The Securities and Exchange Commission (SEC) was established and the old SET was reformulated as the Stock Exchange of Thailand (SET), which is the secondary equity market and is largely self-regulated for day to day operations.
1993	BIBF licenses: The Ministry of Finance announced a name list of 47 international and domestic commercial banks granted a permission to undertake BIBF license. The 47 banks included all 15 domestic commercial banks and 32 overseas banks comprising of ; 8 Japanese, 7 American, 4 French, 2 British, 2 Dutch, 2 Singaporean, 2 German and one each from 5 other countries.
1993	The first prosecution under the Insider Trading Laws.
December 1993	First exchange-traded overseas listing.
1994	Measures to encourage foreign investment: 1. The SET extended its trading hour for the afternoon session for another half and hour. As a consequence, the market ended its trading hour at 4:30 pm. This would help the SET to have comparable trading hour with other stock exchanges in the region and also to have overlapped trading hour with the London Stock Exchange and any other exchanges in the European countries. 2. The SET's Board of Governors approved in the principle for the incorporating of the Thai Trust Fund Company. This company would establish the mutual funds for foreign investors with major purposes of: -utilizing such funds as a tool for transformation of foreign investment's nationality. -preventing unfair usage of foreign investment information -providing trading efficiency at minimum cost increase, and -registering the stated mutual funds as listed securities This trust fund company would have 100 Million baht registered capital with the SET being a major shareholder. Further detail on the process of establishment of the Thai Trust Fund Company would be submitted to SET's Board of Governors for later consideration.
1994	A dealer's network serving as the central channel for all bond trading was established under the name of the Bond dealers club (BDC)
February 1994	The ceiling on the amount authorized banks are permitted to lend to nonresidents in foreign currency was eliminated. The max amount of FDI or loans that domestic residents may provided to their affiliates without authorized form the Bank of Thailand was increased form $5 million to $10 million a year
April 1994	Finance and securities companies were required to hold a daily long and short foreign exchange position not exceeding 25% and 20% respectively, or first-tier capital funds.
November 1994	The average weekly net long and short foreign exchange position that authorized banks are required to hold were changed to 20% and 15% , respectively, of first-tier capital funds.

1995	Regulation on Foreign investors: Restrictions: 1) maximum 49% foreign ownership (restricted foreign shareholding in some specific areas of business, e.g., 25% of commercial banks and finance companies). 2) Foreign capital inflows need to be registered with free repatriation. Commercial banks are authorized to approve the purchase of foreign exchange for remittance abroad without limit. Taxation: 105 dividend tax rate, no tax on individual capital gains and 12.5-15% institution capital gains. No change on this regulation through 2001.
March 1995	The Bank of Thailand required banks to submit detailed information on risk control measures on trading in foreign exchange and derivatives
August 1995	The Bank of Thailand imposed a reserve requirement of 7% on nonresident baht accounts with maturities of less than one year.
September 1995	The Bank of Thailand adopted a new method of calculating non-trade net open foreign exchange positions for foreign and locally incorporated banks, whose foreign-exchange-denominated loans are not to be counted as foreign asset if the loans are used for purchasing unused land or for personal purposes. For certain other categories, only 50% of the loan would be allowed to be counted as a foreign asset. Borrowers who fully hedge the foreign exchange risk by buying foreign exchange forward form the bank that extended the loan are exempt form this requirement.
October 1995	The Thai prime rate stands at 13.75%, the highest in several years
November 95	The Bangkok Stock Dealing Center (BSDC) or the organized OTC market was established to bolster the liquidity of securities, which are offered to the public but are unqualified to be traded on the main SET
August 1996	The Bank of Thailand said it would pump more funds into the market by intervening in the foreign exchange and repurchase markets.
September 1996	The government unveil a tax cut package aimed at stimulating exports and reducing the current account deficit.
December 1996	The government plan to reduce the interest rates.
February 1997	The overnight rate rose to 25%. The baht fell to it lowest level in 10 years.
June 1997	(Controls on derivatives and other instruments) The BOT introduced a series of measures to limit capital inflows.
June 1997	(Controls on capital and money market instruments) The foreign ownership limit of 25% for financial institutions was lifted on a case by case basis
July 1997	Devaluation of Thai baht
August 1997	The central bank ordered 42 finance companies to suspend operations.
September 1997	S&P cut the ratings of seven financial institutions. Thailand was meeting conditions for $17.2 billion rescue package from the IMF.
October 1997	The foreign invertors were allowed full ownership of local financial institutions for up to 10 years

November 1997	The BOT announced that foreign investors would be allowed to hold more than 49% of the shares in existing financial institutions for a period of 10 years without the approval of the Ministry of Finance.
December 1997	58 finance companies were suspended, 56 of which would be closed. Moddy's lowered government debt and he debt of 11 banks and financial companies to junk status. Fitch IBCA cut the debt rating of ten banks.
January 1998	A new state owned commercial bank was launched to manage assets of 56 finance and securities firms closed by the government in 1997. The 49% of foreign ownership limit for securities companies was scapped. Creation of two tier baht exchange market (domestic and offshore). Decision to dismantle currency controls was made on January 30.
February 1998	Definition of bad loans changed to those in which no interest rate has been paid for three consecutive months, comparing to the current standard of six month.
April 1998	Interest rate in Thailand was at six year highs.
April 1998	The BDC was restructured and transform into the Thai Bond Dealing Center (Thai BDC) to cover Thailand's secondary market for bond-trading. It is Self- regulated but subject to SEC oversight.
May 1998	The government nationalized seven finance companies, including two publicly traded firms. S&P downgraded the long term foreign currency rating of the country's five biggest banks. Thailand has $90 billion in foreign debts, largely I in US$.
July 1998	Banks are required to classify loans for which payments have not been made for three months as NPLs
August 1998	Commercial banks are required to maintain at least 6% of their nonresident foreign exchange deposits in the form of (1) at least 2% as nonrenumerated balance at the BOT; (2) at most 2.5% vault cash; and (3) the rest in eligible securities.
September 1998	The government approved tax exemptions for those companies that restructure Delinquent loans.
September 1998	The central bank reported it would ease finance companies' limit on ownership of other companies to promote debt for equity swaps with delinquent borrower
December 1998	Approximately 46% of Thai bank loans were reported delinquent by at least three months.
May 1999	Thailand delinquent loans rose to a record 47.7% of all credit
September 1999	The number of nonperforming loans fell to 45.3% of total credits and continued to fall to 42.3% in November.
February 2000	Creditors fail to reach a debt restructuring agreement with Thai Petrochemical Industry, causing Thai stock market to be the worst performing stock market year to date in the Pacific Rim.
May 2000	Thai baht depreciated by 3%

June 2000	Moody's Investors service raised investment grade, but Thai market still became Asia's biggest decliner as foreign investors dumped shares.
August 2000	Inflation was up by 2.3%
November 2000	The Bank of Thailand tightened regulations on baht trading.
June 2001	The Board of Investment approved 11 investment projects to boost the economy. The government was allowed by the parliament to set up the Thai Asset Management Corp (TAMC), which would buy out nonperforming loans from state owned and private banks.
August 2001	Thailand successfully concluded Article IV consultation with the IMF.
October 2001	The Thai cabinet announced a 58 billion baht economic stimulus plan, and approved a US$ 250 million Thailand Equity fund to boost the country's investment.
October 2001	The cabinet approved Finance Ministry plans to issue up to US$4.46 billion of government bonds and treasury bills in order to finance the 2001-2002 state budget deficit. Thailand's budget deficit was expected to weigh in at around US$4.5 billion, up from initial projection of a US$2.3 billion shortfall.
November 2001	The government was preparing its first oversea sovereign bond issue since the 1997 financial crisis. Japan's Daiwa Securities SMBC and Nikko Solomon Smith Barney were approved by the Finance Ministry to act as co-lead underwriter for the US$281.5 million Samurai bond issue.
February 2002	Thailand's board of Investment (BOI) is to offer investors greater tax priviledge as part of efforts to attract more foreign direct investments (FDI) to the country. The BOI embarks on a series on investment promotion campaigns in countries such as the US, China, Japan, and the European Union (EU) and will open representative office in Hong Kong, San Francisco, California and China.
July 2003	The Central Bank of Thailand (BOT) eased foreign exchange controls, which were imposed following the 1997-1998 Asian financial crisis. Restrictions on participation by domestic entities in foreign debt market were relaxed to allow institutional investors to purchase up to a combined US$500 million in sovereign and quasi-sovereign paper, offered by investment grade issuers.
December 2003	The Bank of Thailand imposed a ceiling of Baht 300 million on deposits by non-residents in Thai bank accounts, with no interest paid on funds held for less than 6 months. Commercial banks will also ensure that current accounts held by non-residents are used solely for the settlement of transactions relating to trade and investment rather than for speculation.

Table 2
Summary Statistics for Total Dataset from 1976 to 2003

All data are yearly data started from 1976 to 2003. The unit of measurement is in Thai baht. The data from 1976 to 1996 are collected from the Stock Exchange of Thailand company profiles and Stock Exchange of Thailand company fact book. The data from 1997 to 2003 are collected from the Global Vantage Program. The unit of measurement for alien board share price (P_AB),main board share price (P), dividend per share (DPSNEW), earning per share (EPS) are in baht. The unit of measurement of sales, net income (NI), property plant and equipment (PPE), total liabilities (TOTAL_LIA), total equity (TOTALEQ), market capitalization (MKTCAP), and total asset (TA) are in thousand baht. The unit of measurement of number of alien board shares (AB_NS) and number of main board share (NS) are in thousand units. LNNS is ln of firm number of share traded. LNNSAB is log of firm alien board number of share traded. P_BV is firm market to book ratio. AB_P_BV is firm alien board market to book ratio. DIV is dividend yield and it is used to measure cost of the firm. DPOUT is dividend payout ratio. REALG_ppe is real growth rate of firm property plant and equipment used to capture firm investment rate. DEBTEQ is total liability divided by total equity to measure firm leverage. LNSL is log of firm sales. LNTA is log of firm total asset. MKTSHARE is firm's market capitalization divided by total market capitalization. LNMS is log of firm mktshare. ROA1 is return on asset used to measure firm's profit level and firm performance. TBQ3 is Tobin's Q which is the ratio of the sum of market capitalization and total liabilities divided by total asset to measure firm's performance. RETURN is the firm main board stock return. RETURNPAB is the firm alien board stock return. G_SALES is firm growth rate in sales. NIPPE is firm's net income divided property plant and equipment to measure firm's rate of return on investment. WRETURN is world stock return. SETRETURN is local index stock return. Invdev85 = investment deviation because of 1985 liberalization. Invdev87 is investment deviation because of 1987 liberalization. Invdev91 is investment deviation because of 1991 liberalization.

Variable	Obs	Mean	Std. Dev.	Min	Max
total_lia	5501	1.54e+07	8.11e+07	0	1.31e+09
ta	5594	1.79e+07	8.68e+07	1297	1.42e+09
totaleq	5473	2817873	1.19e+07	-2.36e+07	4.49e+08
p_ab	1720	167.8992	398.4606	.3	9000
p	4880	143.8325	356.2351	.085	8020
AB_P_BV	1703	2.415183	5.500403	-.374	122.075
p_bv	4839	1.794858	8.68251	-.414	470
sales	5572	4029992	2.20e+07	90	1.32e+09
ni	5600	85353.62	2796645	-9.20e+07	3.94e+07
ppe	4823	2435795	1.04e+07	180	2.33e+08
eps	5580	13.14725	83.59672	-409.62	3331.833
debteq	5463	4.196049	32.44254	-765.11	1176.09
return	4390	-.0813331	.8130804	-5.960012	4.79165
returnpab	1223	-.1759912	.7967569	-5.141132	4.692182
g_eps	5093	3.026457	194.9392	-4308.768	10062
g_sales	5096	.3574496	3.037658	-.9983088	164.9542
g_ta	5121	.3795584	5.205554	-.9193525	322.3019
mktcap	4811	6048445	2.64e+07	13000	6.79e+08
tbq3	4709	1.546785	2.43762	.111277	89.92342
nippe	4813	.2666184	4.19912	-157.8593	85.13842
worldindex	10778	499.2905	352.5583	108.521	1420.89
xrate	10778	26.91533	6.871947	20.4	44.5
windex1	10778	15478.4	14687.87	2213.828	53709.64
lnwindex1	10778	9.192147	.9879995	7.702478	10.89135
wreturn	10309	.1098684	.1646403	-.4553148	.8302045

pbvlag	4397	1.944035	9.091689	-.414	470
abpbvlag	1574	2.562731	5.617622	-.374	122.075
g_nippe	4350	-2.413544	96.51149	-5294.419	317.6768
dpsnew	4480	6.47569	28.63976	0	1699.04
dpout	4445	7.365345	198.4595	-19.23077	12575.88
DIV	4495	.0492581	.1767253	0	5.43913
lnDIV	2840	-3.194072	.9813202	-8.334871	1.693619
debtta	5469	.6067445	.3351971	0	9.296731
debtsl	5419	3.630124	39.72695	0	2774.667
g_ppenew	4361	.1451788	.5196701	-5.551793	7.362415
gfcf_curre~p	10778	735.3858	561.7557	79.4	1892.923
gfcf_const~p	10778	583.0667	333.5111	181.788	1323.009
p_investment	10778	1.097218	.4464601	.4368	1.9738
gfcfindex	10778	109.7214	44.64537	43.6773	197.3818
chgfcfindex	10309	.056891	.0492045	-.0367419	.2608056
realg_ppe	4361	.0957882	.5218683	-5.612743	7.305727
invdev85	4361	.0596355	.5218683	-5.648896	7.269575
debteqlag	5024	4.341545	33.76934	-765.11	1176.09
totalmktcap	10778	9.81e+08	1.20e+09	7708960	4.80e+09
mktshare	4811	.00582	.0191987	8.11e-06	.4280733
lnms	4811	-6.764598	1.767193	-11.7226	-.8484608
roa1	5564	.0377328	.1399683	-3.56702	3.959808
ns	5313	322416	1999982	1	6.80e+07
invdev87	4361	.058042	.5218683	-5.65049	7.267981
lnns	5313	10.10183	2.376308	1.19e-07	18.03467
lnnslag	4868	9.95605	2.369753	1.19e-07	17.62217
DIVlag	4077	.0518464	.1841026	0	5.43913
lntalag	5145	14.41814	1.829341	7.167809	21.07141
lnnsab	1732	5.651273	3.121522	-3.816713	15.2043
ab_ns	1732	35350.13	223961.6	.022	4010000
lnnsablag	1586	5.67415	3.090705	-3.816713	15.2043
mktsharene~g	4361	.0061577	.0199494	8.11e-06	.4280733
set	10778	488.7326	430.7465	82.7	1682.85
lnset	10778	5.816465	.8728292	4.41522	7.428244
setreturn	10309	.0922697	.4021624	-.8489189	1.053761

Table 3

Summary Statistics for the Sub-Sample Dataset that includes the Firms that have Observation before and after 1985

All data are yearly data started from 1976 to 2003. The unit of measurement is in Thai baht. The data from 1976 to 1996 are collected from the Stock Exchange of Thailand company profiles and Stock Exchange of Thailand company fact book. The data from 1997 to 2003 are collected from the Global Vantage Program. The unit of measurement for alien board share price (P_AB),main board share price (P), dividend per share (DPSNEW), earning per share (EPS) are in baht. The unit of measurement of sales, net income (NI), property plant and equipment (PPE), total liabilities (TOTAL_LIA), total equity (TOTALEQ), market capitalization (MKTCAP), and total asset (TA) are in thousand baht. The unit of measurement of number of alien board shares (AB_NS) and number of main board share (NS) are in thousand units. LNNS is ln of firm number of share traded. LNNSAB is log of firm alien board number of share traded. P_BV is firm market to book ratio. AB_P_BV is firm alien board market to book ratio. DIV is dividend yield and it is used to measure cost of the firm. DPOUT is dividend payout ratio. REALG_ppe is real growth rate of firm property plant and equipment used to capture firm investment rate. DEBTEQ is total liability divided by total equity to measure firm leverage. LNSL is log of firm sales. LNTA is log of firm total asset. MKTSHARE is firm's market capitalization divided by total market capitalization. LNMS is log of firm mktshare. ROA1 is return on asset used to measure firm's profit level and firm performance. TBQ3 is Tobin's Q which is the ratio of the sum of market capitalization and total liabilities divided by total asset to measure firm's performance. RETURN is the firm main board stock return. RETURNPAB is the firm alien board stock return. G_SALES is firm growth rate in sales. NIPPE is firm's net income divided property plant and equipment to measure firm's rate of return on investment. WRETURN is world stock return. SETRETURN is local index stock return Invdev85 = investment deviation because of 1985 liberalization. Invdev87 is investment deviation because of 1987 liberalization. Invdev91 is investment deviation because of 1991 liberalization.

Variable	Obs	Mean	Std. Dev.	Min	Max
total_lia	2263	2.54e+07	1.09e+08	2242	1.31e+09
ta	2309	2.85e+07	1.16e+08	13650	1.42e+09
totaleq	2260	3775760	1.70e+07	-3348742	4.49e+08
p_ab	749	258.7029	572.7046	3.7	9000
p	2073	264.0824	509.7244	.49	8020
AB_P_BV	748	2.675786	5.300689	-.044	82.29
p_bv	2061	1.906049	3.598045	-.13	129.14
sales	2327	4322137	1.28e+07	1199	1.49e+08
ni	2337	126513.6	2877857	-5.98e+07	2.08e+07
ppe	1772	2168384	1.21e+07	180	2.33e+08
debteq	2251	5.124067	26.50342	-409.5849	1056.111
return	1951	-.1112493	.7688349	-4.258822	2.171516
returnpab	585	-.181853	.7535652	-3.954734	2.084496
g_eps	2179	.7414499	46.89551	-343.3686	2138.568
g_sales	2219	.2332618	.8405324	-.9980803	23.34027
g_ta	2202	.2180745	.6297025	-.9193525	12.12414
mktcap	2066	5515587	1.75e+07	17550	2.18e+08
tbq3	2031	1.470273	1.667645	.111277	43.89329
lntbq3	2031	.2217447	.4716879	-2.195733	3.781761
nippe	1767	.4292288	3.298025	-37.95655	57.26025
worldindex	2609	480.8246	341.4458	108.521	1420.89
windex1	2609	14580.11	13990.27	2213.828	53709.64
wreturn	2505	.1101127	.1612623	-.2707253	.4817001
abpbvlag	707	2.743754	5.27023	-.044	82.29

pbvlag	1964	1.979882	3.667404	-.13	129.14
invdev85	1663	.1797935	1.546166	-1.104639	34.61201
invdev87	1663	.2037735	1.546166	-1.080659	34.63599
invdev91	1663	-.1558985	1.546166	-1.440331	34.27632
DIV	1899	.0562982	.1337155	0	2.96
lnDIV	1598	-3.116585	.8317081	-7.26443	1.085189
g_ppenew	1663	.1323782	.4214709	-3.82213	3.576229
gfcf_curre~p	2609	718.6922	562.0925	79.4	1892.923
gfcf_const~p	2609	579.9208	337.6271	181.788	1323.009
p_investment	2609	1.072661	.4315291	.4368	1.9738
gfcfindex	2609	107.2658	43.1522	43.6773	197.3818
chgfcfindex	2505	.0573453	.0490777	-.0367419	.2608056
realg_ppe	1663	.0764687	.4229646	-3.860719	3.544974
debteqlag	2156	5.178272	27.05009	-409.5849	1056.111
totalmktcap	2609	9.34e+08	1.16e+09	7708960	4.80e+09
mktshare	2066	.0092435	.0246812	.0000193	.4280733
ns	2133	119580.9	453481	55	8420000
lnns	2133	9.134847	2.303823	4.007333	15.94612
roa1	2303	.0461605	.0880042	-1.846962	.9563348
roe1	2256	.12446	1.497964	-43.29424	44.55206
lnnslag	2037	2.117479	2.269321	-2.900422	8.536102
DIVlag	1807	.0578333	.1365889	0	2.96
lntalag	2211	14.4605	2.104304	9.521495	21.07141
lnnsablag	710	12.84633	3.113579	3.091043	22.11206
ab_ns	753	55755.49	291461.3	.022	4010000
lnnsab	753	5.942917	3.201266	-3.816713	15.2043
lnnsablag	710	5.938578	3.113579	-3.816713	15.2043
lnnslag	2037	9.025246	2.269319	4.007333	15.44475
mktsharene~g	1967	.0095599	.0252072	.0000297	.4280733
set	2609	489.418	436.4021	82.7	1682.85
_merge	2609	3	0	3	3
lnset	2609	5.808112	.8832077	4.41522	7.428244
setreturn	2505	.0936521	.3987585	-.8025689	.9326448

Table 4

Summary Statistics for the Sub-Sample Dataset that includes the Firms that have Observation before and after 1987

All data are yearly data started from 1976 to 2003. The unit of measurement is in Thai baht. The data from 1976 to 1996 are collected from the Stock Exchange of Thailand company profiles and Stock Exchange of Thailand company fact book. The data from 1997 to 2003 are collected from the Global Vantage Program. The unit of measurement for alien board share price (P_AB),main board share price (P), dividend per share (DPSNEW), earning per share (EPS) are in baht. The unit of measurement of sales, net income (NI), property plant and equipment (PPE), total liabilities (TOTAL_LIA), total equity (TOTALEQ), market capitalization (MKTCAP), and total asset (TA) are in thousand baht. The unit of measurement of number of alien board shares (AB_NS) and number of main board share (NS) are in thousand units. LNNS is ln of firm number of share traded. LNNSAB is log of firm alien board number of share traded. P_BV is firm market to book ratio. AB_P_BV is firm alien board market to book ratio. DIV is dividend yield and it is used to measure cost of the firm. DPOUT is dividend payout ratio. REALG_ppe is real growth rate of firm property plant and equipment used to capture firm investment rate. DEBTEQ is total liability divided by total equity to measure firm leverage. LNSL is log of firm sales. LNTA is log of firm total asset. MKTSHARE is firm's market capitalization divided by total market capitalization. LNMS is log of firm mktshare. ROA1 is return on asset used to measure firm's profit level and firm performance. TBQ3 is Tobin's Q which is the ratio of the sum of market capitalization and total liabilities divided by total asset to measure firm's performance. RETURN is the firm main board stock return. RETURNPAB is the firm alien board stock return. G_SALES is firm growth rate in sales. NIPPE is firm's net income divided property plant and equipment to measure firm's rate of return on investment. WRETURN is world stock return. SETRETURN is local index stock return Invdev85 = investment deviation because of 1985 liberalization. Invdev87 is investment deviation because of 1987 liberalization. Invdev91 is investment deviation because of 1991 liberalization.

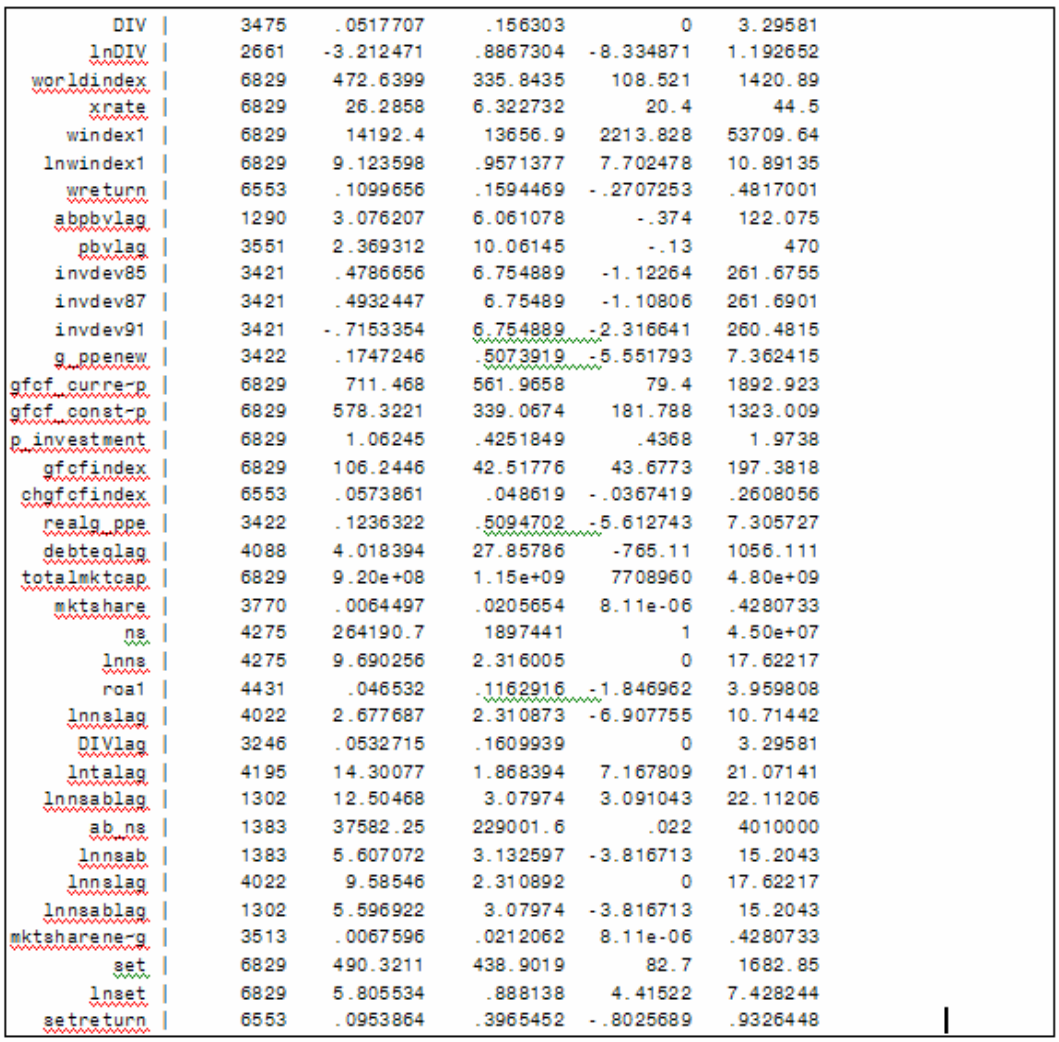
Variable	Obs	Mean	Std. Dev.	Min	Max
total_lia	2421	2.40e+07	1.06e+08	99	1.31e+09
ta	2473	2.69e+07	1.13e+08	1297	1.42e+09
totaleq	2418	3631670	1.64e+07	-3359100	4.49e+08
p_ab	809	247.9272	553.215	2	9000
p	2208	252.9338	496.6206	.49	8020
AB_P_BV	806	2.803516	5.511709	-.044	82.29
p_bv	2195	1.932037	3.534718	-.13	129.14
sales	2487	4688086	2.92e+07	951	1.32e+09
ni	2499	123132.4	2786661	-5.98e+07	2.08e+07
ppe	1899	2149312	1.17e+07	180	2.33e+08
debteq	2409	5.048478	25.95276	-409.5849	1056.111
return	2074	-.1139223	.7697977	-4.258822	2.171516
returnpab	623	-.1795196	.7426359	-3.954734	2.084496
g_ppe	1780	.5668435	7.482325	-.9961195	261.802
g_eps	2337	5.002977	212.9951	-343.3686	10062
g_sales	2366	.2630401	1.053471	-.9983088	26.0656
g_ta	2354	.3634733	6.66804	-.9193525	322.3019
mktcap	2201	5378094	1.70e+07	17550	2.18e+08
tbq3	2162	1.473178	1.635338	.111277	43.89329
nippe	1894	.4384492	3.845504	-37.95655	85.13842
worldindex	2896	477.9438	339.4883	108.521	1420.89
windex1	2896	14443.65	13874.16	2213.828	53709.64
wreturn	2780	.1100837	.1606489	-.2707253	.4817001
abpbvlag	762	2.88447	5.502068	-.044	82.29

pbvlag	2088	2.009655	3.6043	-.13	129.14
lntbq3	2162	.2251756	.4726733	-2.195733	3.781761
invdev85	1780	.4403235	7.482325	-1.12264	261.6755
invdev87	1780	.4549025	7.482325	-1.10806	261.6901
invdev91	1780	.0096369	7.482325	-1.553326	261.2448
DIV	2021	.0562881	.1397613	0	2.96
lnDIV	1690	-3.132664	.8420595	-7.26443	1.085189
g_ppenew	1780	.1440822	.487672	-5.551793	5.571401
gfcf_curre~p	2896	716.2034	562.1031	79.4	1892.923
gfcf_const~p	2896	579.384	338.1532	181.788	1323.009
p_investment	2896	1.069097	.4293678	.4368	1.9738
gfcfindex	2896	106.9094	42.93606	43.6773	197.3818
chgfcfindex	2780	.0573731	.0489612	-.0367419	.2608056
realg_ppe	1780	.0887331	.4886213	-5.612743	5.420103
debteqlag	2303	5.11038	26.51217	-409.5849	1056.111
totalmktcap	2896	9.29e+08	1.15e+09	7708960	4.80e+09
mktshare	2201	.0088085	.0239814	.0000193	.4280733
ns	2303	117839.4	439149.1	4	8420000
lnns	2303	9.205448	2.29523	1.386294	15.94612
roa1	2465	.0451956	.0881883	-1.846962	.9563348
roe1	2412	.121274	1.60403	-43.29424	44.55206
lnnslag	2196	2.18558	2.262156	-5.521461	8.536102
DIVlag	1920	.0578351	.1429086	0	2.96
lntalag	2364	14.45866	2.078445	7.167809	21.07141
lnnsablag	765	12.75314	3.136478	3.091043	22.11206
ab_ns	813	51845.98	280837.5	.022	4010000
lnnsab	813	5.846172	3.21087	-3.816713	15.2043
lnnsablag	765	5.845388	3.136478	-3.816713	15.2043
lnnslag	2196	9.093343	2.262154	1.386294	15.44475
mktsharene~g	2091	.0091249	.024518	.0000297	.4280733
set	2896	489.7373	437.2842	82.7	1682.85
_merge	2896	3	0	3	3
lnset	2896	5.807227	.8849505	4.41522	7.428244
setreturn	2780	.0942176	.3980519	-.8025689	.9326448

Table 5
Summary Statistics for the Sub-Sample Dataset that includes the Firms that have Observation before and after 1991

All data are yearly data started from 1976 to 2003. The unit of measurement is in Thai baht. The data from 1976 to 1996 are collected from the Stock Exchange of Thailand company profiles and Stock Exchange of Thailand company fact book. The data from 1997 to 2003 are collected from the Global Vantage Program. The unit of measurement for alien board share price (P_AB),main board share price (P), dividend per share (DPSNEW), earning per share (EPS) are in baht. The unit of measurement of sales, net income (NI), property plant and equipment (PPE), total liabilities (TOTAL_LIA), total equity (TOTALEQ), market capitalization (MKTCAP), and total asset (TA) are in thousand baht. The unit of measurement of number of alien board shares (AB_NS) and number of main board share (NS) are in thousand units. LNNS is ln of firm number of share traded. LNNSAB is log of firm alien board number of share traded. P_BV is firm market to book ratio. AB_P_BV is firm alien board market to book ratio. DIV is dividend yield and it is used to measure cost of the firm. DPOUT is dividend payout ratio. REALG_ppe is real growth rate of firm property plant and equipment used to capture firm investment rate. DEBTEQ is total liability divided by total equity to measure firm leverage. LNSL is log of firm sales. LNTA is log of firm total asset. MKTSHARE is firm's market capitalization divided by total market capitalization. LNMS is log of firm mktshare. ROA1 is return on asset used to measure firm's profit level and firm performance. TBQ3 is Tobin's Q which is the ratio of the sum of market capitalization and total liabilities divided by total asset to measure firm's performance. RETURN is the firm main board stock return. RETURNPAB is the firm alien board stock return. G_SALES is firm growth rate in sales. NIPPE is firm's net income divided property plant and equipment to measure firm's rate of return on investment. WRETURN is world stock return. SETRETURN is local index stock return Invdev85 = investment deviation because of 1985 liberalization. Invdev87 is investment deviation because of 1987 liberalization. Invdev91 is investment deviation because of 1991 liberalization.

Variable	Obs	Mean	Std. Dev.	Min	Max
total_lia	4352	1.73e+07	9.02e+07	0	1.31e+09
ta	4451	1.96e+07	9.61e+07	1297	1.42e+09
totaleq	4346	2785816	1.29e+07	-9277158	4.49e+08
p_ab	1377	197.884	438.6619	.3	9000
p	3831	176.4505	394.0272	.085	8020
AB_P_BV	1364	2.965794	5.996398	-.374	122.075
p_bv	3800	2.248171	9.740247	-.13	470
sales	4442	3737577	2.23e+07	393	1.32e+09
ni	4467	91889.47	2854630	-9.20e+07	2.08e+07
ppe	3690	1827123	9126076	180	2.33e+08
debteq	4337	3.969362	27.0838	-765.11	1056.111
return	3534	-.1367755	.8070054	-5.960012	4.79165
returnpab	1015	-.1891312	.8009136	-5.141132	4.692182
g_ppe	3421	.6051856	6.754889	-.9961195	261.802
g_eps	4219	5.167804	202.2261	-617.3364	10062
g_sales	4160	.371539	3.190043	-.9983088	164.9542
mktcap	3770	5532394	2.28e+07	15152	6.76e+08
tbq3	3682	1.567991	1.813499	.111277	48.95583
lntbq3	3682	.2613569	.5247588	-2.195733	3.890918
nippe	3680	.3847454	3.017074	-37.95655	85.13842
dpsnew	3467	8.280401	32.32924	0	1699.04
dpout	3444	9.061552	224.4857	-19.23077	12575.88
roe1	4328	.140621	2.956569	-54.60139	161.0089
g1	2861	.0184643	1.601778	-54.60139	23.6224



DIV	3475	.0517707	.156303	0	3.29581
lnDIV	2661	-3.212471	.8867304	-8.334871	1.192652
worldindex	6829	472.6399	335.8435	108.521	1420.89
xrate	6829	26.2858	6.322732	20.4	44.5
windex1	6829	14192.4	13656.9	2213.828	53709.64
lnwindex1	6829	9.123598	.9571377	7.702478	10.89135
wreturn	6553	.1099656	.1594469	-.2707253	.4817001
abpbvlag	1290	3.076207	6.061078	-.374	122.075
pbvlag	3551	2.369312	10.06145	-.13	470
invdev85	3421	.4786656	6.754889	-1.12264	261.6755
invdev87	3421	.4932447	6.75489	-1.10806	261.6901
invdev91	3421	-.7153354	6.754889	-2.316641	260.4815
g_ppenew	3422	.1747246	.5073919	-5.551793	7.362415
gfcf_curre~p	6829	711.468	561.9658	79.4	1892.923
gfcf_const~p	6829	578.3221	339.0674	181.788	1323.009
p_investment	6829	1.06245	.4251849	.4368	1.9738
gfcfindex	6829	106.2446	42.51776	43.6773	197.3818
chgfcfindex	6553	.0573861	.048619	-.0367419	.2608056
realg_ppe	3422	.1236322	.5094702	-5.612743	7.305727
debteglag	4088	4.018394	27.85786	-765.11	1056.111
totalmktcap	6829	9.20e+08	1.15e+09	7708960	4.80e+09
mktshare	3770	.0064497	.0205654	8.11e-06	.4280733
ns	4275	264190.7	1897441	1	4.50e+07
lnns	4275	9.690256	2.316005	0	17.62217
roa1	4431	.046532	.1162916	-1.846962	3.959808
lnnslag	4022	2.677687	2.310873	-6.907755	10.71442
DIVlag	3246	.0532715	.1609939	0	3.29581
lntalag	4195	14.30077	1.868394	7.167809	21.07141
lnnsablag	1302	12.50468	3.07974	3.091043	22.11206
ab_ns	1383	37582.25	229001.6	.022	4010000
lnnsab	1383	5.607072	3.132597	-3.816713	15.2043
lnnslag	4022	9.58546	2.310892	0	17.62217
lnnsablag	1302	5.596922	3.07974	-3.816713	15.2043
mktsharene~g	3513	.0067596	.0212062	8.11e-06	.4280733
set	6829	490.3211	438.9019	82.7	1682.85
lnset	6829	5.805534	.888138	4.41522	7.428244
setreturn	6553	.0953864	.3965452	-.8025689	.9326448

Table 6
The t-Test of Significant Changes in the Mean Value of Firm Main Board/Alien Board Share Price and Firm Main Board/ Alien Board Stock Return Following Each Stock Market Liberalization Year

The Standard error is in parenthesis. The parenthesis under the t-statistic is the p value. The null hypothesis is that the difference between the mean value of Firm Main Board Share Price before and after the stock market liberalization is equal to zero. ***, **, * means significant at 1%, 5%, and 10% respectively.

Firm Main Board Share Price	Liberalization Year	Mean	T-test	Significant Change
I) Period: All years before and all years after liberalization				
P (Baht)	1985			
Before Liberalization		347.8852	-13.4096***	Yes
		(23.07987)	(0.0000)	
After Liberalization		121.7264		
		(4.956747)		
LNP				
Before Liberalization		5.53395	-25.4774***	Yes
		(0.0327414)	(0.0000)	
After Liberalization		3.406134		
		(0.0272574)		
Stock Return (LNP_t-LNP_{t-1})				
Before Liberalization		-0.0609131	-0.5232	No
		(0.0208937)	(0.6009)	
After Liberalization		-0.0833521		
		(0.133259)		
P (Baht)	1987			
Before Liberalization		329.7	-14.3916***	Yes
		(18.02115)	(0.0000)	
After Liberalization		116.029		
		(5.070567)		
LNP				
Before Liberalization		5.47976	-29.6995***	Yes
		(0.0292999)	(0.0000)	
After Liberalization		3.335042		
		(0.0292999)		
Stock Return (LNP_t-LNP_{t-1})				
Before Liberalization		-0.0217838	-1.8255*	Yes
		(0.0172039)	(0.0680)	
After Liberalization		-0.089756		
		(0.0137895		
PAB (Baht)	1991			
Before Liberalization		436.9339	-12.6280***	Yes
		(53.6476)	(0.0000)	
After Liberalization		117.8031		
		(4.4019)		
LNPAB				
Before Liberalization		5.3804	-16.0869***	Yes
		(0.0668)	(0.0000)	
After Liberalization		3.9900		
		(0.0352)		

Alien Board Stock Return ($LNPAB_t - LNPAB_{t-1}$)				
Before Liberalization		-0.1633	-0.1972	No
		(0.0861)	(0.8437)	
After Liberalization		-0.1776		
		(0.0233)		
II) Period: 5 years before and 5 years after liberalization				
P (Baht)	**1985**			
Before Liberalization		239.9595	3.7426***	Yes
		(10.27009)	(0.0000)	
After Liberalization		380.6728		
		(23.8868)		
LNP				
Before Liberalization		5.289209	-0.9048	No
		(0.0331491)	(0.3657)	
After Liberalization		5.22618		
		(0.0428013)		
Stock Return ($LNP_t - LNP_{t-1}$)				
Before Liberalization		-0.1016376	0.3135	No
		(0.0188508)	(0.7540)	
After Liberalization		-0.0833427		
		(0.0388301)		
P (Baht)	**1987**			
Before Liberalization		250.6959	1.3056	No
		(10.73528)	(0.1919)	
After Liberalization		290.8826		
		(17.14351)		
LNP				
Before Liberalization		5.280129	-5.7589***	Yes
		(0.0363863)	(0.0000)	
After Liberalization		4.905094		
		(0.0350909)		
Stock Return ($LNP_t - LNP_{t-1}$)				
Before Liberalization		0.0499306	-2.9118***	Yes
		(0.0153338)	(0.0037)	
After Liberalization		-0.0973676		
		(0.0297181)		
PAB (Baht)	**1991**			
Before Liberalization		436.9339	-7.3456***	Yes
		(53.6476)	(0.0000)	
After Liberalization		179.6406		
		(7.3517)		
LNPAB				
Before Liberalization		5.380401	-8.9781***	Yes
		(0.0668198)	(0.0000)	
After Liberalization		4.707513		
		(0.0385151)		
Alien Board Stock Return ($LNP_t - LNP_{t-1}$)				
Before Liberalization		-0.1633368	-0.5369	No
		(0.086106)	(0.5915)	
After Liberalization		-0.2015396		
		(0.028236)		

III) Period: 3 years before and 3 years after liberalization

P (Baht)	**1985**			
Before Liberalization		232.2983	4.6602***	Yes
		(11.81798)	(0.0000)	
After Liberalization		382.3117		
		(22.22436)		
LNP				
Before Liberalization		5.252624	1.6858*	Yes
		(0.0430293)	(0.0923)	
After Liberalization		5.395278		
		(0.0564013)		
Stock Return (LNP_t-LNP_{t-1})				
Before Liberalization		0.024555	-0.3067	No
		(0.0160615)	(0.7592)	
After Liberalization		0.0044097		
		(0.0487133)		
P (Baht)	**1987**			
Before Liberalization		264.3419	2.9168***	Yes
		(15.06025)	(0.0036)	
After Liberalization		407.3386		
		(29.43041)		
LNP				
Before Liberalization		5.292401	-0.9983	No
		(0.0494525)	(0.3184)	
After Liberalization		5.203468		
		(0.0512188)		
Stock Return (LNP_t-LNP_{t-1})				
Before Liberalization		0.0505909	-2.4317**	Yes
		(0.020723)	(0.0153)	
After Liberalization		-0.1335022		
		(0.0496898)		
PAB (Baht)	**1991**			
Before Liberalization		436.9339	-5.7244***	Yes
		(9.312659)	(0.0000)	
After Liberalization		200.3849		
		(53.64757)		
LNPAB				
Before Liberalization		5.380401	-6.8856***	Yes
		(0.0668198)	(0.0000)	
After Liberalization		4.842886		
		(0.0445679)		
Alien Board Stock Return (LNP_t-LNP_{t-1})				
Before Liberalization		-0.1633368	0.2813	No
		(0.086106)	(0.7786)	
After Liberalization		-0.1407585		
		(0.0369818)		

IV) Period: 1 year before and 1 year after liberalization

P (Baht)	**1985**			
Before Liberalization		242.602	1.0012	No
		(23.49819)	(0.3178)	
After Liberalization		274.7991		
		(19.22221)		
LNP				
Before Liberalization		5.242999	0.6921	No
		(0.0799934)	(0.4846)	
After Liberalization		5.316164		
		(0.0623997)		
Stock Return (LNP_t-LNP_{t-1})				
Before Liberalization		-0.0161551	2.2276**	Yes
		(0.0239188)	(0.0269)	
After Liberalization		0.0819481		
		(0.0279935)		
P (Baht)	**1987**			
Before Liberalization		298.8639	2.4726**	Yes
		(29.11052)	(0.0139)	
After Liberalization		451.3646		
		(33.65159)		
LNP				
Before Liberalization		5.410179	0.2308	No
		(0.0879977)	(0.8176)	
After Liberalization		5.446091		
		(0.0834495)		
Stock Return (LNP_t-LNP_{t-1})				
Before Liberalization		0.2162113	-2.0258**	Yes
		(0.0437364)	(0.0438)	
After Liberalization		-0.0594203		
		(0.0855992)		
PAB (Baht)	**1991**			
Before Liberalization		293.1551	-2.5697**	Yes
		(56.66427)	(0.0106)	
After Liberalization		185.398		
		(11.32065)		
LNPAB				
Before Liberalization		5.121679	-2.7572***	Yes
		(0.088812)	(0.0061)	
After Liberalization		4.843784		
		(0.0548868)		
Alien Board Stock Return (LNP_t-LNP_{t-1})				
Before Liberalization		-0.5693804	3.5195***	Yes
		(0.1064426)	(0.0005)	
After Liberalization		-0.2015458		
		(0.0512793)		

Table 7
The During, Post, and After Effects of the 1985 Stock Market Liberalization on Firm Main Board Stock Return (RETURN)

$$RETURN_{it}=\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Firm_i+e_{m\,it} \quad (8a)$$

$$RETURN_{it}=\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Sector_i+e_{m\,it} \quad (8b)$$

$$RETURN_{it}=\gamma_{1\,m} LNSL_{m\,it}+\gamma_{2\,m} MB_{mit-1}+\gamma_{3m} LNNS_{mit-1}+\gamma_{4m} WRETURN_{m\,it}+\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Firm_i+e_{m\,it} \quad (9a)$$

$$RETURN_{it}=\gamma_{1\,m} LNSL_{m\,it}+\gamma_{2\,m} MB_{mit-1}+\gamma_{3m} LNNS_{mit-1}+\gamma_{4m} WRETURN_{m\,it}+\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Sector_i+e_{m\,it} \quad (9b)$$

$$RETURN_{it}=\gamma_{1\,m} LNSL_{m\,it}+\gamma_{2\,m} MB_{mit-1}+\gamma_{3m} LNNS_{mit-1}+\gamma_{4m} WRETURN_{m\,it}+\gamma_{5m} LNSL_{m\,it}*PRELIB+\gamma_{6m} LNSL_{m\,it}*LIB0+\gamma_{7m} LNSL_{m\,it}*POSTLIB+\gamma_{8m} LNSL_{m\,it}*LIBAF+\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Firm_i+e_{m\,it} \quad (10a)$$

$$RETURN_{it}=\gamma_{1\,m} LNSL_{m\,it}+\gamma_{2\,m} MB_{mit-1}+\gamma_{3m} LNNS_{mit-1}+\gamma_{4m} WRETURN_{m\,it}+\gamma_{5m} LNSL_{m\,it}*PRELIB+\gamma_{6m} LNSL_{m\,it}*LIB0+\gamma_{7m} LNSL_{m\,it}*POSTLIB+\gamma_{8m} LNSL_{m\,it}*LIBAF+\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Sector_i+e_{m\,it} \quad (10b)$$

are used to evaluate the revaluation effect of stock market liberalization on firm Main board stock return. LNSL is log of sales to represent firm size. MB is market to book ratio to represent growth rate of the firm. LNNS is log of firm's number of share traded to represent liquidity level. WRETURN is log of world stock return. PRELIB is the pre-liberalization dummy variable to capture two years before the liberalization. LIB0 is the during -liberalization variable. POSTLIB is the post-liberalization dummy variable. LIBAF is the after-liberalization variable. PRELIBSL is PRELIB*LNSL. LIB0SL is LIB0*LNSL. POSTLIBSL is POSTLIB*LNSL. LIBAFSL is LIBAF*LNSL. Firm is firm specific fixed effect dummies. Sector is sector specific fixed effect dummies. The consistent standard error is in parenthesis. The parenthesis under the Hausman test is probability of chi-square value. Fixed effect estimation with consistent standard error is the estimation method. The first half of the table represents the estimation results after controlling for firm differences. The second half of the table represents the estimation results after controlling for sector differences. WS is whole sample dataset. SS is sub sample dataset. *, **, *** represents the statistically significant at 10%, 5%, and 1% respectively. Sub sample contains only firms that have observation before and after 1985.

Main Board Stock Return	**(1)**		**(2)**		**(3)**	
(RETURN)	**WS**	**SS**	**WS**	**SS**	**WS**	**SS**
Firm Fixed Effect						
LNSL			-0.1035***	-0.0702***	-0.1051***	-0.0715***
			(0.0255)	(0.0178)	(0.0261)	(0.0180)
MB			-0.0058	-0.0289**	-0.0058	-0.0286*
			(0.0040)	(0.0172)	(0.0041)	(0.0171)
LNNS			0.1202***	0.0856***	0.1207***	0.0864***
			(0.0152)	(0.0161)	(0.0153)	(0.0162)
WRETURN			0.1687**	0.1010	0.1692**	0.1118
			(0.0660)	(0.1133)	(0.0660)	(0.1130)
PRELIBSL					-0.0272	-0.0166
					(0.0207)	(0.0199)

Main Board Stock Return	**(1)**		**(2)**		**(3)**	
(RETURN)	**WS**	**SS**	**WS**	**SS**	**WS**	**SS**
LIB0SL					0.0214	0.0254
					(0.0221)	(0.0211)
POSTLIBSL					0.0107	0.0155
					(0.0398)	(0.0383)
LIBAFSL					0.0108	0.0383
					(0.0343)	(0.0406)
PRELIB	0.1511***	0.1629***	0.3629***	0.3340***	0.7223**	0.5550**
	(0.0296)	(0.0284)	(0.0399)	(0.0476)	(0.2785)	(0.2645)
LIB0	0.0457	0.0580*	0.1916***	0.1684***	-0.0947	-0.1731
	(0.0346)	(0.0334)	(0.0496)	(0.0598)	(0.3038)	(0.2920)
POSTLIB	0.6127***	0.6242***	0.7851***	0.7547***	0.6420	0.5475
	(0.0547)	(0.0536)	(0.0627)	(0.0643)	(0.5456)	(0.5245)
LIBAF	-0.2384***	-0.2073***	-0.0874***	-0.0471	-0.2343	-0.5740
	(0.0590)	(0.0708)	(0.0603)	(0.0734)	(0.4786)	(0.5821)
D97	-1.6359***	-1.3900***	-1.6601***	-1.3907***	-1.6599***	-1.3932***
	(0.1232)	(0.1536)	(0.1235)	(0.1535)	(0.1235)	(0.1535)
LIB0-PRELIB	-0.1053***	-0.1048***	-0.1713***	-0.1656***		
	(0.0331)	(0.0321)	(0.0433)	(0.0555)		
POSTLIB-PRELIB	0.4616***	0.4613***	0.4222***	0.4207***		
	(0.0548)	(0.0536)	(0.0585)	(0.0607)		
LIBAF-PRELIB	-0.3895***	-0.3701***	-0.4503***	-0.3811***		
	(0.0621)	(0.0712)	(0.0652)	(0.0883)		
F-Test: $\gamma_5 = \gamma_6 = \gamma_7 = \gamma_8 = 0$					1.42	1.30
					(0.2239)	(0.2660)
Number of OBS	4390	1951	4290	1930	4290	1930
Number of Group	432	104	431	104	431	104
Hausman test	25.57	33.34	32.83	15.41	32.82	15.74
	(0.0001)	(0.0000)	(0.0001)	(0.0803)	(0.0018)	(0.2634)
R^2	0.2312	0.1931	0.2581	0.2233	0.2582	0.2242
Sector Fixed Effect						
LNSL			-0.0486***	-0.0469***	-0.0493***	-0.0496***
			(0.0066)	(0.0117)	(0.0067)	(0.0119)
MB			-0.0068*	-0.0277*	-0.0067*	-0.0274*
			(0.0040)	(0.0167)	(0.0041)	(0.0165)
LNNS			0.0665***	0.0639***	0.0669***	0.0653***
			(0.0085)	(0.0132)	(0.0085)	(0.0133)
WRETURN			0.1262**	0.0814	0.1284**	0.0976
			(0.0640)	(0.1110)	(0.0639)	(0.1107)

Main Board Stock Return (RETURN)	**(1)**		**(2)**		**(3)**	
	WS	**SS**	**WS**	**SS**	**WS**	**SS**
PRELIBSL					0.0041	0.0066
					(0.0165)	(0.0164)
LIB0SL					0.0505***	0.0472**
					(0.0185)	(0.0183)
POSTLIBSL					0.0347	0.0301
					(0.0347)	(0.0350)
LIBAFSL					0.0188	0.0477
					(0.0316)	(0.0396)
PRELIB	0.0998***	0.1464***	0.2811***	0.2921***	0.2289	0.2072
	(0.0238)	(0.0253)	(0.0328)	(0.0450)	(0.2177)	(0.2155)
LIB0	-0.0088	0.0424	0.1188***	0.1336**	-0.5552**	-0.5016**
	(0.0310)	(0.0322)	(0.0446)	(0.0579)	(0.2542)	(0.2548)
POSTLIB	0.5585***	0.6058***	0.7072***	0.7156***	0.2451	0.3141
	(0.0500)	(0.0511)	(0.0558)	(0.0609)	(0.4752)	(0.4803)
LIBAF	-0.2761***	-0.2166***	-0.1515***	-0.0796***	-0.4049	-0.7338
	(0.0546)	(0.0677)	(0.0558)	(0.0718)	(0.4396)	(0.5683)
D97	-1.6320***	-1.3760***	-1.6655***	-1.3841***	-1.6651***	-1.3869***
	(0.1241)	(0.1518)	(0.1265)	(0.1536)	(0.1266)	(0.1537)
LIB0-PRELIB	-0.1085***	-0.1040***	-0.1623***	-0.1586***		
	(0.0326)	(0.0323)	(0.0413)	(0.0543)		
POSTLIB-PRELIB	0.4588***	0.4594***	0.4261***	0.4235***		
	(0.0514)	(0.0516)	(0.0535)	(0.0581)		
LIBAF-PRELIB	-0.3758***	-0.3630***	-0.4326***	-0.3218***		
	(0.0565)	(0.0680)	(0.0600)	(0.0862)		
F-Test: $\gamma_5 = \gamma_6 = \gamma_7 = \gamma_8 = 0$					2.07	1.96
					(0.0826)	(0.0978)
Number of OBS	4390	1951	4290	1930	4290	1930
Number of Group	31	19	31	19	31	19
Hausman test			4.60	6.16	5.31	0.45
			(0.8677)	(0.7242)	(0.9677)	(1.0000)
R^2	0.1813	0.1828	0.2038	0.2075	0.2041	0.2090

Table 8
The During, Post, and After Effects of the 1987 Stock Market Liberalization on Firm Main Board Stock Return (RETURN)

$$RETURN_{it}=\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Firm_i+e_{m\,it} \quad (1a)$$

$$RETURN_{it}=\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Sector_i+e_{m\,it} \quad (1b)$$

$$RETURN_{it}=\gamma_{1\,m} LNSL_{m\,it}+\gamma_{2\,m} MB_{mit-1}+\gamma_{3m} LNNS_{mit-1}+\gamma_{4m} WRETURN_{m\,it}+\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Firm_i+e_{m\,it} \quad (2a)$$

$$RETURN_{it}=\gamma_{1\,m} LNSL_{m\,it}+\gamma_{2\,m} MB_{mit-1}+\gamma_{3m} LNNS_{mit-1}+\gamma_{4m} WRETURN_{m\,it}+\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Sector_i+e_{m\,it} \quad (2b)$$

$$RETURN_{it}=\gamma_{1\,m} LNSL_{m\,it}+\gamma_{2\,m} MB_{mit-1}+\gamma_{3m} LNNS_{mit-1}+\gamma_{4m} WRETURN_{m\,it}+\gamma_{5m} LNSL_{m\,it}*PRELIB+\gamma_{6m} LNSL_{m\,it}*LIB0+\gamma_{7m} LNSL_{m\,it}*POSTLIB+\gamma_{8m} LNSL_{m\,it}*LIBAF+\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Firm_i+e_{m\,it} \quad (3a)$$

$$RETURN_{it}=\gamma_{1\,m} LNSL_{m\,it}+\gamma_{2\,m} MB_{mit-1}+\gamma_{3m} LNNS_{mit-1}+\gamma_{4m} WRETURN_{m\,it}+\gamma_{5m} LNSL_{m\,it}*PRELIB+\gamma_{6m} LNSL_{m\,it}*LIB0+\gamma_{7m} LNSL_{m\,it}*POSTLIB+\gamma_{8m} LNSL_{m\,it}*LIBAF+\theta_1 PRELIB+\theta_2 LIB0+\theta_3 POSTLIB+\theta_4 LIBAF+\Theta_5 D97+Sector_i+e_{m\,it} \quad (3b)$$

are used to evaluate the revaluation effect of stock market liberalization on firm Main board stock return. LNSL is log of sales to represent firm size. MB is market to book ratio to represent growth rate of the firm. LNNS is log of firm's number of share traded to represent liquidity level. WRETURN is log of world stock return. PRELIB is the pre-liberalization dummy variable to capture two years before the liberalization. LIB0 is the during -liberalization variable. POSTLIB is the post-liberalization dummy variable. LIBAF is the after-liberalization variable. PRELIBSL is PRELIB*LNSL. LIB0SL is LIB0*LNSL. POSTLIBSL is POSTLIB*LNSL. LIBAFSL is LIBAF*LNSL. Firm is firm specific fixed effect dummies. Sector is sector specific fixed effect dummies. The consistent standard error is in parenthesis. The parenthesis under the Hausman test is probability of chi-square value. The Parenthesis under F-test is probability of F-value. Fixed effect estimation with consistent standard error is the estimation method. The first half of the table represents the estimation results after controlling for firm differences. The second half of the table represents the estimation results after controlling for sector differences. WS is whole sample dataset. SS is sub sample dataset. *, **, *** represents the statistically significant at 10%, 5%, and 1% respectively. Sub sample contains only firms that have observation before and after 1985.

Main Board Stock Return	**(1)**		**(2)**		**(3)**	
(RETURN)	**WS**	**SS**	**WS**	**SS**	**WS**	**SS**
Firm Fixed Effect						
LNSL			-0.1011***	-0.0615***	-0.1141***	-0.0654***
			(0.0256)	(0.0163)	(0.0271)	(0.0169)
MB			-0.0059	-0.0294	-0.0054	-0.0285
			(0.0040)	(0.0188)	(0.0040)	(0.0185)
LNNS			0.1157***	0.0753***	0.1202***	0.0783***
			(0.0146)	(0.0141)	(0.0150)	(0.0145)
WRETURN			0.1397**	0.0433	0.1378**	0.0401
			(0.0656)	(0.1017)	(0.0656)	(0.1013)
PRELIBSL					0.0302	0.0307
					(0.0232)	(0.0219)

Main Board Stock Return	**(1)**		**(2)**		**(3)**	
(RETURN)	**WS**	**SS**	**WS**	**SS**	**WS**	**SS**
LIB0SL					0.0158	0.0160
					(0.0568)	(0.0539)
POSTLIBSL					-0.0258	-0.0018
					(0.0423)	(0.0451)
LIBAFSL					0.0770***	0.0685*
					(0.0286)	(0.0360)
PRELIB	0.1867***	0.1700***	0.3208***	0.2768***	-0.0776	-0.1262
	(0.0348)	(0.0337)	(0.0457)	(0.0509)	(0.3214)	(0.3042)
LIB0	0.9017***	0.8849***	1.0591***	0.9929***	0.8510	0.7835
	(0.0760)	(0.0748)	(0.0807)	(0.0790)	(0.7783)	(0.7391)
POSTLIB	0.0617	-0.0247	0.1713***	0.1019	0.5170	0.1270
	(0.0761)	(0.0827)	(0.0766)	(0.0854)	(0.5906)	(0.6388)
LIBAF	-0.1615***	-0.2144***	-0.0913**	-0.1337**	-1.1562***	-1.0990**
	(0.0380)	(0.0533)	(0.0387)	(0.0605)	(0.3958)	(0.5170)
D97	-1.6381***	-1.4997***	-1.6573***	-1.4920***	-1.6542***	-1.4918***
	(0.1233)	(0.1485)	(0.1236)	(0.1485)	(0.1234)	(0.1486)
LIB0-PRELIB	0.7150***	0.7148***	0.7383***	0.7161***		
	(0.0794)	(0.0782)	(0.0850)	(0.0861)		
POSTLIB-PRELIB	-0.1250	-0.1947**	-0.1495*	-0.1749*		
	(0.0798)	(0.0851)	(0.0825)	(0.0939)		
LIBAF-PRELIB	-0.3482***	-0.3845***	-0.4121***	-0.4104***		
	(0.0492)	(0.0589)	(0.0604)	(0.0840)		
F-Test: $\gamma_5 = \gamma_6 = \gamma_7 = \gamma_8 = 0$					2.44	1.33
					(0.0451)	(0.2555)
Number of OBS	4390	2074	4290	2053	4290	2053
Number of Group	432	116	431	116	431	116
Hausman test	22.25	15.69	45.77	22.27	49.13	29.08
	(0.0005)	(0.0078)	(0.0000)	(0.0080)	(0.0000)	(0.0064)
R^2	0.2316	0.2112	0.2591	0.2395	0.2613	0.2419
Sector Fixed Effect						
LNSL			-0.0465***	-0.0408***	-0.0495***	-0.0457***
			(0.0062)	(0.0101)	(0.0063)	(0.0106)
MB			-0.0067*	-0.0281	-0.0062	-0.0272
			(0.0040)	(0.0181)	(0.0039)	(0.0177)
LNNS			0.0642***	0.0568***	0.0671***	0.0602***
			(0.0078)	(0.0113)	(0.0079)	(0.0116)
WRETURN			0.0857	0.0231	0.0890	0.0247
			(0.0633)	(0.0998)	(0.0634)	(0.0996)

Main Board Stock Return (RETURN)	(1) WS	SS	(2) WS	SS	(3) WS	SS
PRELIBSL					0.0476**	0.0448**
					(0.0192)	(0.0194)
LIB0SL					0.0319	0.0270
					(0.0504)	(0.0504)
POSTLIBSL					-0.0216	0.0035
					(0.0395)	(0.0443)
LIBAFSL					0.0702***	0.0684**
					(0.0240)	(0.0339)
PRELIB	0.1223***	0.1525***	0.2561***	0.2504***	-0.3715	-0.3421
	(0.0318)	(0.0326)	(0.0416)	(0.0494)	(0.2669)	(0.2715)
LIB0	0.8377***	0.8662***	0.9831***	0.9618***	0.5642	0.6075
	(0.0712)	(0.0722)	(0.0733)	(0.0746)	(0.6902)	(0.6896)
POSTLIB	0.0148	-0.0327	0.1076	0.0775	0.4012	0.0328
	(0.0717)	(0.0802)	(0.0721)	(0.0838)	(0.5503)	(0.6281)
LIBAF	-0.2198***	-0.2229***	-0.1619***	-0.1526**	-0.1272***	-1.1140**
	(0.0335)	(0.0508)	(0.0348)	(0.0588)	(0.3308)	(0.4861)
D97	-1.6380***	-1.4815***	-1.6649***	-1.4820***	-1.6636***	-1.4816***
	(0.1243)	(0.1460)	(0.1265)	(0.1477)	(0.1266)	(0.1480)
LIB0-PRELIB	0.7154***	0.7137***	0.7270***	0.7114***		
	(0.0757)	(0.0764)	(0.0785)	(0.0827)		
POSTLIB-PRELIB	-0.1075	-0.1852**	-0.1485*	-0.1729*		
	(0.0764)	(0.0839)	(0.0789)	(0.0926)		
LIBAF-PRELIB	-0.3421***	-0.3754***	-0.4180***	-0.4031***		
	(0.0431)	(0.0561)	(0.0547)	(0.0813)		
F-Test $\gamma_5 = \gamma_6 = \gamma_7 = \gamma_8 = 0$					3.59	2.13
					(0.0062)	(0.0741)
Number of OBS	4390	2074	4290	2053	4290	2053
Number of Group	31	22	31	22	31	22
Hausman test	2.93				1.61	
	(0.7106)				(0.9999)	
R^2	0.1834	0.1998	0.2064	0.2236	0.2086	0.2264

Table 9
The During, Post, and After Effects of the 1991 Stock Market Liberalization on Firm Alien Board Stock Return (RETURNPAB)

$$RETURNPAB_{it} = \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Firm_i + e_{ab\,it} \quad (11a)$$

$$RETURNPAB_{it} = \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF\, \Theta_5 D97 + Sector_i + e_{ab\,it} \quad (11b)$$

$$RETURNPAB_{it} = \gamma_{1\,ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Firm_i + e_{ab\,it} \quad (12a)$$

$$RETURNPAB_{it} = \gamma_{1\,ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Sector_i + e_{ab\,it} \quad (12b)$$

$$RETURNPAB_{it} = \gamma_{1\,ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \gamma_{5ab} LNSL_{ab\,it} * PRELIB + \gamma_{6ab} LNSL_{ab\,it} * LIB0 + \gamma_{7ab} LNSL_{ab\,it} * POSTLIB + \gamma_{8ab} LNSL_{ab\,it} * LIBAF + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Firm_i + e_{ab\,it} \quad (13a)$$

$$RETURNPAB_{it} = \gamma_{1\,ab} LNSL_{ab\,it} + \gamma_{2\,ab} MB_{abit-1} + \gamma_{3\,ab} LNNS_{abit-1} + \gamma_{4ab} WRETURN_{ab\,it} + \gamma_{5ab} LNSL_{ab\,it} * PRELIB + \gamma_{6ab} LNSL_{ab\,it} * LIB0 + \gamma_{7ab} LNSL_{ab\,it} * POSTLIB + \gamma_{8ab} LNSL_{ab\,it} * LIBAF + \theta_1 PRELIB + \theta_2 LIB0 + \theta_3 POSTLIB + \theta_4 LIBAF + \Theta_5 D97 + Sector_i + e_{ab\,it} \quad (13b)$$

are used to evaluate the revaluation effect of stock market liberalization on Firm Alien Board Stock Return. LNSL is log of sales to represent firm size. MB is the Alien board market to book ratio to represent growth rate of the firm. LNNS is log of firm's number of Alien board share traded to represent liquidity level. WRETURN is log of world stock return. PRELIB is the pre-liberalization dummy variable to capture two years before the liberalization. LIB0 is the during -liberalization variable. POSTLIB is the post-liberalization dummy variable. LIBAF is the after-liberalization variable. PRELIBSL is PRELIB*LNSL. LIB0SL is LIB0*LNSL. POSTLIBSL is POSTLIB*LNSL. LIBAFSL is LIBAF*LNSL. Firm is firm specific fixed effect dummies. Sector is sector specific fixed effect dummies. The consistent standard error is in parenthesis. The parenthesis under the Hausman test is probability of chi-square value. Fixed effect estimation with consistent standard error is the estimation method. The first half of the table represents the estimation results after controlling for firm differences. The second half of the table represents the estimation results after controlling for sector differences. WS is whole sample dataset. SS is sub sample dataset *, **, *** represents the statistically significant at 10%, 5%, and 1% respectively. Sub sample contains only firms that have observation before and after 1991.

Alien Board Stock Return (RETURNPAB)	**(1)**		**(2)**		**(3)**	
	WS	**SS**	**WS**	**SS**	**WS**	**SS**
Firm Fixed Effect						
LNSL			-0.0922	-0.1483**	-0.0772	-0.1485***
			(0.0707)	(0.0321)	(0.0817)	(0.0333)
MB			-0.0101	-0.0102	-0.0102	-0.0102
			(0.0065)	(0.0064)	(0.0066)	(0.0065)
LNNS			-0.0149	-0.0072	-0.0167	-0.0071
			(0.0145)	(0.0154)	(0.0152)	(0.0161)
WRETURN			0.3112**	0.5186***	0.3187**	0.5252***
			(0.1547)	(0.1962)	(0.1550)	(0.1968)
PRELIBSL					-0.0529	-0.0250
					(0.0686)	(0.0607)

Alien Board Stock Return	**(1)**		**(2)**		**(3)**	
(RETURNPAB)	**WS**	**SS**	**WS**	**SS**	**WS**	**SS**
LIB0SL					0.0388	0.0687
					(0.0898)	(0.0866)
POSTLIBSL					-0.0643	-0.0426
					(0.0714)	(0.0681)
LIBAFSL					-0.0016	0.0172
					(0.0491)	(0.0446)
PRELIB	-0.0511***	-0.0540***	-0.0706	-0.0897	0.7036	0.2649
	(0.1299)	(0.1287)	(0.1658)	(0.1382)	(1.0352)	(0.8771)
LIB0	-0.2343**	-0.2372**	-0.3046**	-0.3626***	-0.8326	-1.3426
	(0.1069)	(0.1060)	(0.1302)	(0.1175)	(1.3149)	(1.2479)
POSTLIB	0.1792**	0.1763**	0.1479	0.1301	1.1023	0.7497
	(0.0873)	(0.0870)	(0.1068)	(0.0953)	(1.0420)	(0.9757)
LIBAF	-0.2150***	-0.2157***	-0.2084**	-0.2129***	0.1729	-0.4726
	(0.0763)	(0.0773)	(0.0816)	(0.0812)	(0.7581)	(0.6802)
D97	-0.7635***	-0.7948***	-0.8352***	-0.9098***	-0.8367***	-0.9118***
	(0.1595)	(0.1613)	(0.1712)	(0.1765)	(0.1721)	(0.1767)
LIB0-PRELIB	-0.1832	-0.1831	-0.2340*	-0.2729**		
	(0.1295)	(0.1276)	(0.1353)	(0.1313)		
POSTLIB-PRELIB	0.2304*	0.2304**	0.2186*	0.2198*		
	(0.1185)	(0.1168)	(0.1239)	(0.1141)		
LIBAF-PRELIB	-0.1639	-0.1616	-0.1378	-0.1232		
	(0.1159)	(0.1143)	(0.1407)	(0.1190)		
F-Test: $\gamma_5 = \gamma_6 = \gamma_7 = \gamma_8 = 0$					0.57	0.54
					(0.6854)	(0.7067)
Number of OBS	1223	1015	1214	1007	1214	1007
Number of Group	237	173	234	170	234	170
Hausman test	7.33	6.86	10.04	33.37	13.02	35.01
	(0.1972)	(0.2312)	(0.3473)	(0.0001)	(0.4460)	(0.0008)
R^2	0.2266	0.2121	0.2430	0.2384	0.2451	0.2407
Sector Fixed Effect						
LNSL			-0.0034	-0.0063	-0.0057	-0.0090
			(0.0074)	(0.0082)	(0.0076)	(0.0085)
MB			-0.0114***	-0.0112***	-0.0113***	-0.0112***
			(0.0041)	(0.0041)	(0.0041)	(0.0042)
LNNS			-0.0004	0.0016	0.0003	0.0025
			(0.0101)	(0.0110)	(0.0101)	(0.0110)
WRETURN			0.2557*	0.5000***	0.2558*	0.5020***
			(0.1378)	(0.1756)	(0.1380)	(0.1757)

Alien Board Stock Return (RETURNPAB)	**(1)**		**(2)**		**(3)**	
	WS	**SS**	**WS**	**SS**	**WS**	**SS**
PRELIBSL					-0.0058	-0.0046
					(0.0540)	(0.0536)
LIB0SL					0.1284*	0.1307*
					(0.0726)	(0.0729)
POSTLIBSL					0.0006	-0.0033
					(0.0508)	(0.0513)
LIBAFSL					0.0242	0.0323
					(0.0315)	(0.0319)
PRELIB	-0.0937	-0.0957	0.0093	-0.0477	0.0941	0.1143
	(0.0927)	(0.0974)	(0.0937)	(0.0974)	(0.7685)	(0.7633)
LIB0	-0.3208***	-0.3227***	-0.2902***	-0.3075***	-2.1135**	-2.1650**
	(0.0918)	(0.0958)	(0.0946)	(0.1003)	(1.0423)	(1.0471)
POSTLIB	0.1418**	0.1493**	0.1834***	0.2005***	0.1732	0.2461
	(0.0609)	(0.0686)	(0.0638)	(0.0725)	(0.7136)	(0.7184)
LIBAF	-0.2458*	-0.2442***	-0.1991***	-0.2021***	-0.5633	-0.6881
	(0.0508)	(0.0587)	(0.0568)	(0.0664)	(0.4769)	(0.4834)
D97	-0.7548***	-0.7856***	-0.7943***	-0.8902***	-0.7913***	-0.8885***
	(0.1479)	(0.1517)	(0.1562)	(0.1648)	(0.1561)	(0.1647)
LIB0-PRELIB	-0.2271*	-0.2270*	-0.2995**	-0.3552***		
	(0.1214)	(0.1217)	(0.1223)	(0.1232)		
POSTLIB-PRELIB	0.2355**	0.2450**	0.1740*	0.1527		
	(0.0999)	(0.1004)	(0.0990)	(0.0981)		
LIBAF-PRELIB	-0.1521	-0.1484	-0.2085**	-0.2499***		
	(0.0943)	(0.0949)	(0.0937)	(0.0939)		
F-Test: $\gamma_5 = \gamma_6 = \gamma_7 = \gamma_8 = 0$					0.89	1.00
					(0.4699)	(0.4090)
Number of OBS	1223	1015	1214	1007	1214	1007
Number of Group	29	27	29	27	29	27
Hausman test	11.52	5.85		21.52	2.30	
	(0.0420)	(0.3214)		(0.0105)	(0.9995)	
R^2	0.1131	0.1326	0.1229	0.1493	0.1265	0.1539

Table 10
The t-Test of Significant Changes in the Mean Value of Firm Investment rate Following Each Stock Market Liberalization Year Under Four Scenarios

The parenthesis under the t-statistic is the p value. The null hypothesis is that the difference between the mean value of firm's main board share price before and after the stock market liberalization is equal to zero. ***, **, * means significant at 1%, 5%, and 10% respectively.

Firm Investment	Liberalization Year	Mean	T-test	Significant Change
Variable: REALG_PPE				
I).Period: All Years Before and After Liberalization				
	1985			
Before Liberalization		0.0811	0.6386	No
After Liberalization		0.0975	(0.5231)	
	1987			
Before Liberalization		0.0657	1.5187	No
After Liberalization		0.1006	(0.1289)	
II).Period: 5 Years Before Liberalization and 5 Years After Liberalization				
	1985			
Before Liberalization		0.0249	5.9618***	Yes
After Liberalization		0.2366	(0.000)	
	1987			
Before Liberalization		0.0272	8.4903***	Yes
After Liberalization		0.3340	(0.0000)	
III).Period: 3 Years Before Liberalization and 3 Years After Liberalization				
	1985			
Before Liberalization		0.0362	2.1963***	Yes
After Liberalization		0.1159	(0.0285)	
	1987			
Before Liberalization		0.0377	5.4194***	Yes
After Liberalization		0.2886	(0.0000)	
IV).Period: 1 Years Before Liberalization and 1 Years After Liberalization				
	1985			
Before Liberalization		0.0846	-1.8442*	Yes
After Liberalization		0.0148	(0.0666)	
	1987			
Before Liberalization		0.0510	1.9345*	Yes
After Liberalization		0.1775	(0.0540)	

Table 11
The t-Test of Significant Changes in the Mean Value of Firm Cost of Capital Following Each Stock Market Liberalization Year Under Four Scenarios

The parenthesis under the t-statistic is the p value. The null hypothesis is that the difference between the mean value of firm's main board share price before and after the stock market liberalization is equal to zero. ***, **, * means significant at 1%, 5%, and 10% respectively.

Firm Investment	Liberalization Year	Mean	T-test	Significant Change
A) Variable: DIV (Dividend Yield)				
I).Period: All Years Before and After Liberalization				
	1985			
Before Liberalization		0.0823	-4.0878***	Yes
After Liberalization		0.0458	(0.0000)	
	1987			
Before Liberalization		0.0797	-4.3200***	Yes
After Liberalization		0.0450	(0.0000)	
II).Period: 5 Years Before Liberalization and 5 Years After Liberalization				
	1985			
Before Liberalization		0.0943	-8.1640***	Yes
After Liberalization		0.0444	(0.0000)	
	1987			
Before Liberalization		0.0875	-6.9093***	Yes
After Liberalization		0.0420	(0.0000)	
III).Period: 3 Years Before Liberalization and 3 Years After Liberalization				
	1985			
Before Liberalization		0.0933	-4.2129***	Yes
After Liberalization		0.0538	(0.0000)	
	1987			
Before Liberalization		0.0889	-6.0401***	Yes
After Liberalization		0.0391	(0.0000)	
IV).Period: 1 Years Before Liberalization and 1 Years After Liberalization				
	1985			
Before Liberalization		0.1251	-1.8254*	Yes
After Liberalization		0.0703	(0.0696)	
	1987			
Before Liberalization		0.0595	-3.5565***	Yes
After Liberalization		0.0449	(0.0004)	

Firm Investment	Liberalization Year	Mean	T-test	Significant Change
B) Variable: LNDIV (log of dividend yield value)				
I).Period: All Years Before and After Liberalization				
	1985			
Before Liberalization		-2.6842	-11.9353***	Yes
After Liberalization		-3.2843	(0.0000)	
	1987			
Before Liberalization		-2.6991	-13.5266***	Yes
After Liberalization		-3.3119	(0.0000)	
II).Period: 5 Years Before Liberalization and 5 Years After Liberalization				
	1985			
Before Liberalization		-2.5234	-18.1352***	Yes
After Liberalization		-3.3252	(0.0000)	
	1987			
Before Liberalization		-2.6191	-18.5557***	Yes
After Liberalization		-3.4395	(0.0000)	
III).Period: 3 Years Before Liberalization and 3 Years After Liberalization				
	1985			
Before Liberalization		-2.5265	-10.5806***	Yes
After Liberalization		-3.0840	(0.0000)	
	1987			
Before Liberalization		-2.6759	-14.4103***	Yes
After Liberalization		-3.4431	(0.0000)	
IV).Period: 1 Year Before Liberalization and 1 Year After Liberalization				
	1985			
Before Liberalization		-2.5258	-2.6324***	Yes
After Liberalization		-2.7529	(0.0092)	
	1987			
Before Liberalization		-2.8813	-5.1160****	Yes
After Liberalization		-3.2615	(0.0000)	

Table 12
During, Post, and After Effects of the 1985 Stock Market Liberalization on Firm Investment Rate

$$REALG\_PPE_{it} = FIRM_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi_4 LIBAF + \Theta_4 D97 + e_{it} \quad (20a)$$

$$REALG\_PPE_{it} = SECTOR_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi_4 LIBAF + \Theta_4 D97 + e_{it} \quad (20b)$$

$$REALG\_PPE_{it} = FIRM_i + \lambda_1 DIV_{it-1} + \lambda_2 G\_SALES_{it} + \lambda_3 LNTA_{it-1} + \delta PRELIB + \theta_1 LIB0 + \theta_2 POSTLIB + \theta_3 LIBAF + \Theta_4 D97 + e_{it} \quad (21a)$$

$$REALG\_PPE_{it} = SECTOR_i + \lambda_1 DIV_{it-1} + \lambda_2 G\_SALES_{it} + \lambda_3 LNTA_{it-1} + \delta PRELIB + \theta_1 LIB0 + \theta_2 POSTLIB1 + \theta_3 LIBAF + \Theta_4 D97 + e_{it} \quad (21B)$$

are used to evaluate the pre, post, and after effect of 1985 stock market liberalization on firm investment rate. PRELIB takes value of one on two years before liberalization. LIB0 takes value of one on year of liberalization. POSTLIB takes value of one on one and two year after liberalization to capture post liberalization effect. LIBAF takes value of one after two years of liberalization to capture long-term effect. G_PPE is growth rate of firm property plant and equipment to proxy for firm investment. G_SALES is growth rate of firm sales to proxy for firm growth rate. LNDIV is dividend yield to proxy for firm cost of capital. LNTA is log of firm total asset to represent firm size. The parenthesis under the Hausman test is probability of chi-square value. Fixed effect estimation with consistent standard error is the estimation method. The first half of the table represents the estimation results after controlling for firm differences. WS is original dataset. SS is sub sample dataset that contains only the firms that have observations before and after 1985. The second half of the table represents the estimation results after controlling for sector differences. *, **, *** represents the statistical significance at 10%, 5%, and 1% respectively.

Firm Investment rate	**(7)**		**(8)**	
(REALG_PPE)	**WS**	**SS**	**WS**	**SS**
Firm Fixed Effect				
DIV			-0.0411	-0.0713
			(0.0304)	(0.0542)
G_SALES			0.0572	0.1305**
			(0.0354)	(0.0659)
LNTA			-0.1147***	-0.0072
			(0.0153)	(0.0049)
PRELIB	0.0272	0.0091	-0.1506***	-0.0208
	(0.0315)	(0.0312)	(0.0395)	(0.0342)
LIB0	-0.0831**	-0.1015***	-0.1886***	-0.0579
	(0.0355)	(0.0350)	(0.0585)	(0.0563)
POSTLIB	0.0201	-0.0091	-0.0969*	0.0225
	(0.0363)	(0.0362)	(0.0544)	(0.0497)
LIBAF	0.2046	0.1224***	0.0597*	0.1244***
	(0.0309)	(0.0336)	(0.0340)	(0.0350)
D97	-0.1394***	-0.1967***	-0.1062	-0.1655**
	(0.0596)	(0.0673)	(0.0707)	(0.0764)
LIB0-PRELIB	-0.1103***	-0.1107***	-0.0380	-0.0370
	(0.0405)	(0.0397)	(0.0547)	(0.0549)

Firm Investment rate (REALG_PPE)	**(7) WS**	**SS**	**(8) WS**	**SS**
POSTLIB-PRELIB	-0.0071 (0.0411)	-0.0183 (0.0405)	0.0537 (0.0555)	0.0433 (0.0542)
LIBAF-PRELIB	0.1774*** (0.0389)	0.1132*** (0.0390)	0.2103*** (0.0424)	0.1452*** (0.0442)
Hausman test	92.80 (0.0000)	35.45 (0.0000)	59.05 (0.0000)	3.92 (0.8645)
Number of OBS	4361	1663	3451	1371
Number of Group	406	94	399	93
R^2	0.1466	0.0824	0.1731	0.1407
Sector Fixed Effect				
DIV			-0.0224 (0.0293)	-0.0411 (0.0573)
G_SALES			0.0555 (0.0411)	0.1433** (0.0595)
LNTA			0.0046*** (0.0013)	0.0046* (0.0026)
PRELIB	0.0358 (0.0281)	0.0244 (0.0301)	0.0012 (0.0260)	-0.0047 (0.0276)
LIB0	-0.0704** (0.0313)	-0.0809** (0.0331)	-0.0394 (0.0506)	-0.0433 (0.0520)
POSTLIB	0.0383 (0.0343)	0.0115 (0.0368)	0.0469 (0.0439)	0.0361 (0.0451)
LIBAF	0.2535*** (0.0303)	0.1428*** (0.0341)	0.2005*** (0.0301)	0.1379*** (0.0354)
D97	-0.1219** (0.0575)	-0.1818*** (0.0658)	-0.1078 (0.0685)	-0.1652** (0.0710)
LIB0-PRELIB	-0.1062*** (0.0388)	-0.1053*** (0.0386)	-0.0407 (0.0531)	-0.0386 (0.0529)
POSTLIB-PRELIB	0.0025 (0.0408)	-0.0130 (0.0408)	0.0457 (0.0493)	0.0409 (0.0489)
LIBAF-PRELIB	0.2177*** (0.0385)	0.1184*** (0.0389)	0.1992*** (0.0363)	0.1426*** (0.0393)
Hausman test	5.22 (0.3895)	9.51 (0.0902)	7.77 (0.4565)	4.38 (0.8210)
Number of OBS	4361	1663	3451	1371
Number of Group	31	19	31	19
R^2	0.0613	0.0541	0.0622	0.1070

Table 13
During, Post, and After Effects of the 1987 Stock Market Liberalization on Firm Investment Rate

$$REALG\_PPE_{it} = FIRM_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi_4 LIBAF + \Theta_4 D97 + e_{it} \quad (7a)$$

$$REALG\_PPE_{it} = SECTOR_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi_4 LIBAF + \Theta_4 D97 + e_{it} \quad (7b)$$

$$REALG\_PPE_{it} = FIRM_i + \lambda_1 DIV1_{it-1} + \lambda_2 G\_SALES_{it} + \lambda_3 LNTA_{it-1} + \delta PRELIB + \theta_1 LIB0 + \theta_2 POSTLIB + \theta_3 LIBAF + \Theta_4 D97 + e_{it} \quad (8a)$$

$$REALG\_PPE_{it} = SECTOR_i + \lambda_1 DIV1_{it-1} + \lambda_2 G\_SALES_{it} + \lambda_3 LNTA_{it-1} + \delta PRELIB + \theta_1 LIB0 + \theta_2 POSTLIB1 + \theta_3 LIBAF + \Theta_4 D97 + e_{it} \quad (8B)$$

are used to evaluate the pre, post, and after effect of 1987 stock market liberalization on firm investment rate. PRELIB takes value of one on two years before liberalization. LIB0 takes value of one on year of liberalization. POSTLIB takes value of one on one and two year after liberalization to capture post liberalization effect. LIBAF takes value of one after two years of liberalization to capture long-term effect. G_PPE is growth rate of firm property plant and equipment to proxy for firm investment. G_SALES is growth rate of firm sales to proxy for firm growth rate. LNDIV1 is dividend yield to proxy for firm cost of capital. LNTA is log of firm total asset to represent firm size. The parenthesis under the Hausman test is probability of chi-square value. Fixed effect estimation with consistent standard error is the estimation method. The first half of the table represents the estimation results after controlling for firm differences. WS is original dataset. SS is sub sample dataset that contains only the firms that have observations before and after 1987. The second half of the table represents the estimation results after controlling for sector differences. *, **, *** represents the statistical significance at 10%, 5%, and 1% respectively.

Firm Investment rate	**(7)**		**(8)**	
(REALG_PPE)	**WS**	**SS**	**WS**	**SS**
Firm Fixed Effect				
DIV			-0.0432	-0.0801
			(0.0314)	(0.0616)
G_SALES			0.0563	0.2114***
			(0.0351)	(0.0382)
LNTA			-0.0840***	-0.0103**
			(0.0141)	(0.0052)
PRELIB	-0.0007	-0.0248	0.0537	0.0309
	(0.0287)	(0.0287)	(0.0461)	(0.0433)
LIB0	0.1014*	0.0766	0.0108	0.0617
	(0.0538)	(0.0530)	(0.0734)	(0.0698)
POSTLIB	0.2337***	0.1855***	0.1580***	0.1915***
	(0.0341)	(0.0381)	(0.0400)	(0.0418)
LIBAF	0.3335***	0.2586***	0.2594***	0.2530***
	(0.0279)	(0.0452)	(0.0332)	(0.0432)
D97	-0.1000**	-0.2748**	-0.0785	-0.2167
	(0.0592)	(0.1357)	(0.0703)	(0.1355)
LIB0-PRELIB	0.1021*	0.1013*	0.0645	0.0308
	(0.0570)	(0.0559)	(0.0802)	(0.0781)

Firm Investment rate	**(7)**		**(8)**	
(REALG_PPE)	**WS**	**SS**	**WS**	**SS**
POSTLIB-PRELIB	0.2344***	0.2102***	0.2117***	0.1606***
	(0.0404)	(0.0426)	(0.0544)	(0.0564)
LIBAF-PRELIB	0.3342***	0.2834***	0.3131***	0.2221***
	(0.0370)	(0.0481)	(0.0517)	(0.0557)
Hausman test	3.36	7.06	39.36	8.02
	(0.6444)	(0.2161)	(0.0000)	(0.4316)
Number of OBS	4361	1780	3451	1457
Number of Group	406	103	399	102
R^2	0.1777	0.1173	0.1946	0.2776
Sector Fixed Effect				
DIV			-0.0261	-0.0478
			(0.0295)	(0.0614)
G_SALES			0.0529	0.2146***
			(0.0414)	(0.0363)
LNTA			0.0024*	0.0007
			(0.0013)	(0.0026)
PRELIB	0.0082	-0.0106	0.0360	0.0376
	(0.0257)	(0.0275)	(0.0391)	(0.0407)
LIB0	0.1151**	0.0949*	0.1006	0.0694
	(0.0521)	(0.0542)	(0.0624)	(0.0630)
POSTLIB	0.2528***	0.2027***	0.2552***	0.2014***
	(0.0337)	(0.0390)	(0.0390)	(0.0426)
LIBAF	0.3769***	0.2775***	0.3198***	0.2590***
	(0.0275)	(0.0434)	(0.0304)	(0.0411)
D97	-0.0861***	-0.2607**	-0.0669	-0.2144*
	(0.0572)	(0.1315)	(0.0684)	(0.1298)
LIB0-PRELIB	0.1069*	0.1055*	0.0647	0.0318
	(0.0555)	(0.0562)	(0.0729)	(0.0728)
POSTLIB-PRELIB	0.2446***	0.2133***	0.2192***	0.1639***
	(0.0399)	(0.0422)	(0.0531)	(0.0555)
LIBAF-PRELIB	0.3687***	0.2881***	0.2838***	0.2215***
	(0.0359)	(0.0474)	(0.0479)	(0.0537)
Hausman test	7.54	3.37	7.29	14.01
	(0.1835)	(0.6428)	(0.5054)	(0.0816)
Number of OBS	4361	1780	3451	1457
Number of Group	31	22	31	22
R^2	0.1065	0.0991	0.1021	0.2548

Table 14
The Effect of the 1985 Stock Market Liberalization on Firm Cost of Capital (DIV)

$$DIV_{it} = FIRM_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (22a)$$

$$DIV_{it} = SECTOR_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (22b)$$

$$DIV_{it} = FIRM_i + \Theta_1 LNTA_{it} + \Theta_2 G\_EPS_{it} + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (23a)$$

$$DIV_{it} = SECTOR_i + \Theta_1 LNTA_{it} + \Theta_2 G\_EPS_{it} + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (23b)$$

are used to evaluate the effect of stock market liberalization on firm's cost of capital. LNTA is log of firm total asset used to proxy for firm size. G_EPS is growth rate of firm earning per share. PRELIB is two years before liberalization years. LIB0 is during liberalization year. POSTLIB is two years after liberalization dummy variable to represent post liberalization year. LIBAF is after two years of liberalization dummy variable. The parenthesis under the Hausman test is probability of chi-square value. Fixed effect estimation with consistent standard error is the estimation method. The standard error is in parenthesis. The first half of the table represents the estimation results after controlling for firm differences. The second half of the table represents the estimation results after controlling for sector differences. *, **, *** represents the statistical significance at 10%, 5%, and 1% respectively. WS is whole sample dataset. SS is sub sample dataset that contains only firms that have observation before and after 1985.

Firm Cost of Capital (DIV)	**(9)**		**(10)**	
	WS	**SS**	**WS**	**SS**
Firm Fixed Effect				
LNTA			-0.0068***	-0.0015
			(0.0023)	(0.0010)
G_EPS			-3.54e-06	-4.50e-06
			(2.68e-06)	(7.01e-06)
PRELIB	0.0577***	0.0572*	0.0302***	0.0348***
	(0.0216)	(0.0209)	(0.0046)	(0.0039)
LIB0	0.0330***	0.0325***	0.0271***	0.0317***
	(0.0069)	(0.0064)	(0.0064)	(0.0058)
POSTLIB	-0.0067	-0.0064	-0.0113**	-0.0074
	(0.0052)	(0.0047)	(0.0050)	(0.0046)
LIBAF	-0.0057	-0.0056	-0.0083**	-0.0057
	(0.0038)	(0.0040)	(0.0040)	(0.0039)
D97	0.1772***	0.1596***	0.2317***	0.1719***
	(0.0334)	(0.0538)	(0.0542)	(0.0568)
LIB0-PRELIB	-0.0247	-0.0247	-0.0031	-0.0031
	(0.0227)	(0.0221)	(0.0063)	(0.0061)
POSTLIB-PRELIB	-0.0643***	-0.0635***	-0.0415***	-0.0422***
	(0.0220)	(0.0214)	(0.0052)	(0.0051)
LIBAF-PRELIB	-0.0633***	-0.0628***	-0.0385***	-0.0405***
	(0.0217)	(0.0212)	(0.0047)	(0.0048)

Firm Cost of Capital (DIV)	**(9)**		**(10)**	
	WS	**SS**	**WS**	**SS**
Hausman test	193.20 (0.0000)	249.30 (0.0000)	2.25 (0.8954)	23.55 (0.0014)
Number of OBS	4495	1899	4202	1844
Number of Group	467	104	429	104
R^2	0.2481	0.2578	0.2649	0.1844
Sector Fixed Effect				
LNTA			0.0030*** (0.0005)	0.0027** (0.0012)
G_EPS			-3.28e-06 (2.76e-06)	-2.41e-06 (5.84e-06)
PRELIB	0.0633*** (0.0215)	0.0588*** (0.0208)	0.0448*** (0.0047)	0.0401*** (0.0046)
LIB0	0.0420*** (0.0069)	0.0375*** (0.0067)	0.0424*** (0.0067)	0.0381*** (0.0065)
POSTLIB	0.0055 (0.0036)	0.0009 (0.0041)	0.0068** (0.0034)	-0.0013 (0.0040)
LIBAF	0.0048* (0.0027)	-0.0005 (0.0038)	0.0035 (0.0026)	-0.0014 (0.0037)
D97	0.1756*** (0.0347)	0.1649*** (0.0570)	0.2312*** (0.0570)	0.1701*** (0.0582)
LIB0-PRELIB	-0.0213 (0.0219)	-0.0213 (0.0218)	-0.0023 (0.0068)	-0.0020 (0.0063)
POSTLIB-PRELIB	-0.0577*** (0.0210)	-0.0570*** (0.0207)	-0.0380*** (0.0042)	-0.0388*** (0.0037)
LIBAF-PRELIB	-0.0585*** (0.0214)	-0.0593*** (0.0211)	-0.0413*** (0.0044)	-0.0415*** (0.0039)
Hausman test				4.61 (0.7073)
Number of OBS	4495	1899	4202	1844
Number of Group	31	19	31	19
R^2	0.1310	0.2040	0.1542	0.2323

Table 15
The Effect of the 1987 Stock Market Liberalization on Firm Cost of Capital (DIV1)

$$DIV1_{it} = FIRM_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (9a)$$

$$DIV1_{it} = SECTOR_i + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (9b)$$

$$DIV1_{it} = FIRM_i + \Theta_1 LNTA_{it} + \Theta_2 G\_EPS_{it} + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (10a)$$

$$DIV1_{it} = SECTOR_i + \Theta_1 LNTA_{it} + \Theta_2 G\_EPS_{it} + \varphi_1 PRELIB + \varphi_2 LIB0 + \varphi_3 POSTLIB + \varphi 4LIBAF + \Theta_4 D97 + e_{it} \quad (10b)$$

are used to evaluate the effect of stock market liberalization on firm's cost of capital. LNTA is log of firm total asset used to proxy for firm size. PRELIB is two years before liberalization years. LIB0 is during liberalization year. POSTLIB is two years after liberalization dummy variable to represent post liberalization year. LIBAF is after two years of liberalization dummy variable. The parenthesis under the Hausman test is probability of chi-square value. Fixed effect estimation with consistent standard error is the estimation method. The standard error is in parenthesis. The first half of the table represents the estimation results after controlling for firm differences. The second half of the table represents the estimation results after controlling for sector differences. *, **, *** represents the statistical significance at 10%, 5%, and 1% respectively. WS is whole sample dataset. SS is sub sample dataset that contains only firms that have observation before and after 1987.

Firm Cost of Capital	**(9)**		**(10)**	
(DIV1)	**WS**	**SS**	**WS**	**SS**
Firm Fixed Effect				
LNTA			-0.0085***	-0.0026***
			(0.0021)	(0.0011)
G_EPS			-3.86e-06	-2.11e-06**
			(2.71e-06)	(8.20e-07)
PRELIB	0.0134**	0.0127**	0.0102**	0.0136***
	(0.0062)	(0.0060)	(0.0050)	(0.0048)
LIB0	-0.0208***	-0.0235***	-0.0255***	-0.0233***
	(0.0063)	(0.0062)	(0.0055)	(0.0054)
POSTLIB	-0.0104**	-0.0130***	-0.0143***	-0.0118***
	(0.0044)	(0.0051)	(0.0043)	(0.0045)
LIBAF	-0.0006	-0.0072	0.0014	-0.0041
	(0.0056)	(0.0085)	(0.0053)	(0.0084)
D97	0.1762***	0.1491***	0.2321***	0.1635***
	(0.0334)	(0.0502)	(0.0543)	(0.0527)
LIB0-PRELIB	-0.0342***	-0.0362***	-0.0357***	-0.0369***
	(0.0064)	(0.0061)	(0.0057)	(0.0055)
POSTLIB-PRELIB	-0.0238***	-0.0257***	-0.0245***	-0.0254***
	(0.0056)	(0.0057)	(0.0050)	(0.0051)
LIBAF-PRELIB	-0.0140**	-0.0199**	-0.0088	-0.0177**
	(0.0067)	(0.0079)	(0.0063)	(0.0080)

Firm Cost of Capital (DIV1)	**(9)**		**(10)**	
	WS	**SS**	**WS**	**SS**
Hausman test	152.30 (0.0000)	166.30 (0.0000)	136.07 (0.0000)	42.32 (0.0000)
Number of OBS	4495	2021	4202	1966
Number of Group	467	116	429	116
R^2	0.2457	0.2387	0.2643	0.2565
Sector Fixed Effect				
LNTA			0.0029*** (0.0005)	0.0026*** (0.0012)
G_EPS			-3.25e-06 (2.74e-06)	-3.55e-06*** (1.23e-06)
PRELIB	0.0284*** (0.0048)	0.0215*** (0.0054)	0.0305*** (0.0045)	0.0237*** (0.0048)
LIB0	-0.0058 (0.0039)	-0.0140*** (0.0046)	-0.0049 (0.0037)	-0.0124*** (0.0042)
POSTLIB	0.0009 (0.0032)	-0.0076 (0.0050)	0.0007 (0.0030)	-0.0060 (0.0043)
LIBAF	0.0120*** (0.0043)	-0.0003 (0.0083)	0.0084* (0.0043)	-0.0011 (0.0083)
D97	0.1752*** (0.0347)	0.1542*** (0.0532)	0.2311*** (0.0571)	0.1602*** (0.0540)
LIB0-PRELIB	-0.0342*** (0.0045)	-0.0355*** (0.0042)	-0.0354*** (0.0043)	-0.0362*** (0.0038)
POSTLIB-PRELIB	-0.0275*** (0.0043)	-0.0291*** (0.0044)	-0.0298*** (0.0041)	-0.0297*** (0.0041)
LIBAF-PRELIB	-0.0164*** (0.0052)	-0.0218*** (0.0071)	-0.0221*** (0.0052)	-0.0248*** (0.0072)
Hausman test	279.21 (0.0000)		16.81 (0.0187)	3.92 (0.7895)
Number of OBS	4495	2021	4202	1966
Number of Group	31	22	31	22
R^2	0.1285	0.1842	0.1528	0.2101

Table 16
The t-test of Significant Changes in the Mean Value of Firm Performance (as measured by Tobin's Q) following the 1985, 1987, and 1991 Stock Market Liberalization

The Standard error is in parenthesis. The parenthesis under the t-statistic is the p value. The null hypothesis is that the difference between the mean value of firm Tobin's Q before and after the stock market liberalization is equal to zero. ***, **, * means significant at 1%, 5%, and 10% respectively.

Firm Performance	Liberalization Year	Mean	T-test	Significant Change
I)Period: All years before and all years after liberalization				
Tobin's Q	1985			
Before Liberalization		1.2407	2.8712***	Yes
		(0.0278)	(0.0041)	
After Liberalization		1.5807		
		(0.0393)		
Tobin's Q	1987			
Before Liberalization		1.2254	3.5505***	Yes
		(0.0235)	(0.0004)	
After Liberalization		1.5962		
		(0.0408)		
II)Period: 5 years before and 5 years after liberalization				
Tobin' Q	1985			
Before Liberalization		1.0593	7.9812***	Yes
		(0.0117)	(0.0000)	
After Liberalization		2.2947		
		(0.1014)		
Tobin's Q	1987			
Before Liberalization		1.1054	9.1517***	Yes
		(0.0206)	(0.0000)	
After Liberalization		2.2693		
		(0.0738)		
III)Period: 3 years before and 3 years after Liberalization				
Tobin's Q	1985			
Before Liberalization		1.0492	4.2542***	Yes
		(0.0138)	(0.0000)	
After Liberalization		2.0229		
		(0.1650)		
Tobin's Q	1987			
Before Liberalization		1.1487	7.1456***	Yes
		(0.0311)	(0.0000)	
After Liberalization		2.5865		
		(0.1248)		

Firm Performance	Liberalization Year	Mean	T-test	Significant Change
IV)Period: 1 year before and 1 year after Liberalization				
Tobin's Q	1985			
Before Liberalization		1.0851	1.4258	No
		(0.0308)	(0.1553)	
After Liberalization		1.1795		
		(0.0436)		
Tobin's Q	1987			
Before Liberalization		1.2472	2.8318***	Yes
		(0.0781)	(0.0049)	
After Liberalization		2.5746		
		(0.2658)		

Table 17
The Mean Value of Firm Return on Asset (ROA) to Measure Firm profitability Level in Various Period and Firm performance

The Standard error is in parenthesis. The parenthesis under the t-statistic is the p value. The null hypothesis is that the difference between the mean value of firm ROA before and after the stock market liberalization is equal to zero. ***, **, * means significant at 1%, 5%, and 10% respectively.

Firm ROA	Liberalization Year	Mean	T-test	Significant Change
I).Period: All Years Before and After Liberalization				
	1985			
Before Liberalization		0.0409	-0.6180	No
After Liberalization		0.0373	(0.5366)	
	1987			
Before Liberalization		0.0397	-0.4554	No
After Liberalization		0.0374	(0.6489)	
II).Period: 5 Years Before Liberalization and 5 Years After Liberalization				
	1985			
Before Liberalization		0.0334	5.7704***	Yes
After Liberalization		0.0761	(0.0000)	
	1987			
Before Liberalization		0.0347	7.0041***	Yes
After Liberalization		0.0779	(0.0000)	
III).Period: 3 Years Before Liberalization and 3 Years After Liberalization				
	1985			
Before Liberalization		0.0337	3.3426***	Yes
After Liberalization		0.0706	(0.0009)	
	1987			
Before Liberalization		0.0343	5.5831***	Yes
After Liberalization		0.0853	(0.0000)	
IV).Period: 1 Years Before Liberalization and 1 Years After Liberalization				
	1985			
Before Liberalization		0.0306	0.7378	No
After Liberalization		0.0361	(0.4612)	
	1987			
Before Liberalization		0.0409	2.2665**	Yes
After Liberalization		0.0877	(0.0238)	

Table 18
The Mean Value of Firm Rate of Return on Investment as Calculated by Firm Net Income Divided by Firm Property Plant and Equipment in Various Scenarios

The Standard error is in parenthesis. The parenthesis under the t-statistic is the p value. The null hypothesis is that the difference between the mean value of firm rate of return on investment before and after the stock market liberalization is equal to zero. ***, **, * means significant at 1%, 5%, and 10% respectively.

Firm ROR on Investment	Liberalization Year	Mean	T-test	Significant Change
I).Period: All Years Before and After Liberalization				
	1985			
Before Liberalization		0.9234	-3.8875***	Yes
After Liberalization		0.1826	(0.0001)	
	1987			
Before Liberalization		0.8588	-4.0121***	Yes
After Liberalization		0.1673	(0.0001)	
II).Period: 5 Years Before Liberalization and 5 Years After Liberalization				
	1985			
Before Liberalization		0.6617	-0.1318	No
After Liberalization		0.6338	(0.8952)	
	1987			
Before Liberalization		0.6188	-0.1739	No
After Liberalization		0.5854	(0.8620)	
III).Period: 3 Years Before Liberalization and 3 Years After Liberalization				
	1985			
Before Liberalization		0.6212	0.2813	No
After Liberalization		0.7226	(0.7786)	
	1987			
Before Liberalization		0.6468	-0.0328	No
After Liberalization		0.6374	(0.9738)	
IV).Period: 1 Years Before Liberalization and 1 Years After Liberalization				
	1985			
Before Liberalization		0.7138	-0.1430	No
After Liberalization		0.6154	(0.8864)	
	1987			
Before Liberalization		0.3578	0.7320	No
After Liberalization		0.7700	(0.4646)	

Table 19
The Mean Value of Firm Debt to Equity Ratio as Calculated by Firm Total Debt Divided by Firm Total Equity in Various Scenarios

The Standard error is in parenthesis. The parenthesis under the t-statistic is the p value. The null hypothesis is that the difference between the mean value of firm debt to equity ratio on investment before and after the stock market liberalization is equal to zero. ***, **, * means significant at 1%, 5%, and 10% respectively.

Firm Debt to Equity Ratio	Liberalization Year	Mean	T-test	Significant Change
I).Period: All Years Before and After Liberalization				
	1985			
Before Liberalization		6.7557	-2.1099**	Yes
After Liberalization		3.8619	(0.0349)	
	1987			
Before Liberalization		6.6112	-2.3629**	Yes
After Liberalization		3.7510	(0.0182)	
II).Period: 5 Years Before Liberalization and 5 Years After Liberalization				
	1985			
Before Liberalization		7.5227	-0.4202	No
After Liberalization		4.7053	(0.1558)	
	1987			
Before Liberalization		7.3570	-2.0574**	Yes
After Liberalization		3.9587	(0.0398)	
III).Period: 3 Years Before Liberalization and 3 Years After Liberalization				
	1985			
Before Liberalization		8.2357	-0.8368	No
After Liberalization		5.5714	(0.4029)	
	1987			
Before Liberalization		8.2309	-1.5301	No
After Liberalization		4.3597	(0.1263)	
IV).Period: 1 Years Before Liberalization and 1 Years After Liberalization				
	1985			
Before Liberalization		12.5042	-0.8293	No
After Liberalization		6.1923	(0.4076)	
	1987			
Before Liberalization		5.0174	0.0693	No
After Liberalization		5.2588	(0.9448)	

Table 20
The During, Post, and After Effects of the 1985 Stock Market Liberalization on Firm Performance (Tobin's Q)

$$TOBINQ_{it} = FIRM_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (25a)$$

$$TOBINQ_{it} = SECTOR_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (25b)$$

$$TOBINQ_{it} = FIRM_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (26a)$$

$$TOBINQ_{it} = SECTOR_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (26b)$$

are used to evaluate the during, post, and after effect of 1985 stock market liberalization on firm performance. TOBINQ is Tobin's Q to measure firm performance. MKTSHARE is firm market share. It is firm's market capitalization divided by total market capitalization. LNSL is log of sales to represent firm size. DEBTEQ is firm debt to equity ratio to represent firm leverage. PRELIB is the pre-liberalization years to represent two years before liberalization. LIB0 is during liberalization dummy variable. POSTLIB is post liberalization dummy variable to represent two years after liberalization. LIBAF is after liberalization variable to represents all years after post liberalization years. Firm is firm specific fixed effect dummies. Sector is sector specific fixed effect dummies. α is constant term**.** The parenthesis under the Hausman test is probability of chi-square value. Fixed effect estimation with consistent standard error is the estimation method. The consistent standard error is in parenthesis. WS is whole sample dataset. SS is sub sample dataset that contains only the firms that have observation before and after 1985 *, **, *** represents the statistically significant at 10%, 5%, and 1% respectively

Firm Performance	**(11)**		**(12)**	
(TOBINQ)	**WS**	**SS**	**WS**	**SS**
Firm Fixed Effect				
MKTSHARE			11.3957	3.6997
			(7.7120)	(2.4517)
DEBTEQ			-0.0005	0.0002
			(0.0005)	(0.0002)
LNSL			-0.0752**	0.0621***
			(0.0375)	(0.0113)
PRELIB	-0.1434***	-0.1549***	-0.3322***	-0.1547***
	(0.0540)	(0.0526)	(0.0730)	(0.0577)
LIB0	-0.0937	-0.1075	-0.2233***	-0.0749
	(0.0717)	(0.0707)	(0.0851)	(0.0742)
POSTLIB	1.1054***	1.0977***	0.9161**	1.0714***
	(0.3294)	(0.3278)	(0.3889)	(0.3689)
LIBAF	1.1088***	0.9125***	0.8965***	0.9368***
	(0.0889)	(0.0966)	(0.0881)	(0.0982)
D97	-0.3467**	-0.2798***	-0.2252	-0.2917***
	(0.1351)	(0.0808)	(0.1761)	(0.0674)
LIB0-PRELIB	0.0496	0.0474	0.1090	0.0798
	(0.0784)	(0.0784)	(0.0899)	(0.0783)
POSTLIB-PRELIB	1.2488***	1.2527***	1.2483***	1.2261***
	(0.3276)	(0.3259)	(0.3762)	(0.3653)

Firm Performance (TOBINQ)	**(11)** **WS**	**SS**	**(12)** **WS**	**SS**
LIBAF-PRELIB	1.2521*** (0.0978)	1.0675*** (0.1054)	1.2287*** (0.1072)	1.0915*** (0.1091)
Hausman test	19.64 (0.0015)		76.76 (0.0000)	
Number of OBS	4709	2031	4213	1905
Number of Group	465	104	429	104
R^2	0.4655	0.5336	0.5352	0.5384
Sector Fixed Effect				
MKTSHARE			13.0678** (6.5719)	2.3777 (1.4779)
DEBTEQ			-0.0009** (0.0004)	0.0001 (0.0002)
LNSL			0.0785*** (0.0039)	0.0699*** (0.0128)
PRELIB	-0.2365*** (0.0726)	-0.1171*** (0.0399)	-0.2133** (0.0856)	-0.1179*** (0.0431)
LIB0	-0.1500* (0.0865)	-0.0386 (0.0602)	-0.1361 (0.0867)	-0.0684 (0.0565)
POSTLIB	1.0651*** (0.3345)	1.1780*** (0.3406)	1.0039*** (0.3763)	1.0903*** (0.3775)
LIBAF	1.2085*** (0.1032)	1.0224*** (0.1046)	1.0236*** (0.0960)	0.9641*** (0.1045)
D97	-0.2396** (0.1121)	-0.2228*** (0.0744)	-0.1974 (0.1730)	-0.3453*** (0.0528)
LIB0-PRELIB	0.0865 (0.0729)	0.0785 (0.0599)	0.0772 (0.0747)	0.0495 (0.0530)
POSTLIB-PRELIB	1.3016*** (0.3278)	1.2951*** (0.3306)	1.2172*** (0.3682)	1.2083*** (0.3640)
LIBAF-PRELIB	1.4450*** (0.1016)	1.1396*** (0.1064)	1.2369*** (0.1103)	1.0821*** (0.1109)
Hausman test	959.44 (0.0000)	42.81 (0.0000)	11.51 (0.1178)	17.25 (0.0276)
Number of OBS	4709	2031	4213	1905
Number of Group	31	19	31	19
R^2	0.3014	0.4784	0.4186	0.4920

Table 21
The During, Post, and After Effects of the 1985 Stock Market Liberalization on Firm Performance (ROA)

$$ROA_{it} = FIRM_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (27a)$$

$$ROA_{it} = SECTOR_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (27b)$$

$$ROA_{it} = FIRM_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (28a)$$

$$ROA_{it} = SECTOR_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (28b)$$

are used to evaluate the during, post, and after effect of 1985 stock market liberalization on firm performance. ROA is firm return on asset used to measure firm performance. MKTSHARE is firm market share. It is firm's market capitalization divided by total market capitalization. LNSL is log of sales to represent firm size. DEBTEQ is firm debt to equity ratio to represent firm leverage. PRELIB is the pre-liberalization year to represent two years before liberalization. LIB0 is during liberalization dummy variable. POSTLIB is post liberalization dummy variable to represent two years after liberalization. LIBAF is after liberalization variable to represents all years after post liberalization years. Firm is firm specific fixed effect dummies. Sector is sector specific fixed effect dummies. α is constant term**.** The parenthesis under the Hausman test is probability of chi-square value. Fixed effect estimation with consistent standard error is the estimation method. WS is whole sample dataset. SS is sub sample dataset that contains only the firms that have observation before and after 1985. The consistent standard error is in parenthesis. *, **, *** represents the statistically significant at 10%, 5%, and 1% respectively

Firm Performance	**(13)**		**(14)**	
(ROA)	**WS**	**SS**	**WS**	**SS**
Firm Fixed Effect				
MKTSHARE			0.2711***	0.2450***
			(0.0609)	(0.0631)
DEBTEQ			-2.23e-04	-0.0001
			(5.19e-04)	(0.0001)
LNSL			0.0093***	0.0032***
			(0.0023)	(0.0008)
PRELIB	-0.0014	-0.0041	0.0103*	0.0036
	(0.0044)	(0.0043)	(0.0054)	(0.0047)
LIB0	-0.0052	-0.0084	0.0070	0.0015
	(0.0063)	(0.0061)	(0.0085)	(0.0081)
POSTLIB	0.0235***	0.0198***	0.0258***	0.0193***
	(0.0051)	(0.0057)	(0.0056)	(0.0049)
LIBAF	0.0555***	0.0387***	0.0493***	0.0402***
	(0.0058)	(0.0040)	(0.0042)	(0.0042)
D97	-0.0304***	-0.0292***	-0.0330***	-0.0312***
	(0.0084)	(0.0099)	(0.0080)	(0.0099)
LIB0-PRELIB	-0.0038	-0.0043	-0.0033	-0.0021
	(0.0069)	(0.0067)	(0.0083)	(0.0080)
POSTLIB-PRELIB	0.0250***	0.0239***	0.0155***	0.0157***
	(0.0061)	(0.0064)	(0.0055)	(0.0053)

Firm Performance (ROA)	**(13)**		**(14)**	
	WS	**SS**	**WS**	**SS**
LIBAF-PRELIB	0.0569***	0.0428***	0.0390***	0.0366***
	(0.0062)	(0.0049)	(0.0050)	(0.0048)
Hausman test	135.59	175.37	85.56	120.48
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Number of OBS	5564	2303	4244	1921
Number of Group	469	104	430	104
R^2	0.3389	0.4423	0.4491	0.4920
Sector Fixed Effect				
MKTSHARE			0.3397***	0.1250***
			(0.0679)	(0.0387)
DEBTEQLAG			-0.0001	-0.0001
			(0.0001)	(0.0001)
LNSL			0.0031***	0.0027***
			(0.0004)	(0.0005)
PRELIB	0.0086*	-0.0006	0.0066	-0.0022
	(0.0048)	(0.0047)	(0.0045)	(0.0046)
LIB0	0.0043	-0.0048	0.0056	-0.0039
	(0.0068)	(0.0067)	(0.0085)	(0.0082)
POSTLIB	0.0319***	0.0235***	0.0247***	0.0158***
	(0.0054)	(0.0060)	(0.0046)	(0.0046)
LIBAF	0.0635***	0.0424***	0.0518***	0.0405***
	(0.0063)	(0.0043)	(0.0039)	(0.0044)
D97	-0.0286***	-0.0243***	-0.0230**	-0.0282**
	(0.0088)	(0.0116)	(0.0090)	(0.0115)
LIB0-PRELIB	-0.0043	-0.0042	-0.0010	-0.0018
	(0.0077)	(0.0076)	(0.0090)	(0.0085)
POSTLIB-PRELIB	0.0232***	0.0241***	0.0181***	0.0180***
	(0.0067)	(0.0070)	(0.0057)	(0.0054)
LIBAF-PRELIB	0.0549***	0.0430***	0.0453***	0.0427***
	(0.0076)	(0.0056)	(0.0053)	(0.0054)
Hausman test	42.30		124.26	14.99
	(0.0000)		(0.0000)	(0.0593)
Number of OBS	5564	2303	4244	1921
Number of Group	31	19	31	19
R^2	0.1211	0.3291	0.1375	0.3529

Table 22
The During, Post, and After Effects of the 1987 Stock Market Liberalization on Firm Performance (Tobin's Q)

$$TOBINQ_{it} = FIRM_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (11a)$$

$$TOBINQ_{it} = SECTOR_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (11b)$$

$$TOBINQ_{it} = FIRM_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (12a)$$

$$TOBINQ_{it} = SECTOR_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (12b)$$

are used to evaluate the during, post, and after effect of 1987 stock market liberalization on firm performance. TOBINQ is Tobin's Q to measure firm performance. MKTSHARE is firm market share. It is firm's market capitalization divided by total market capitalization. LNSL is log of sales to represent firm size. DEBTEQ is firm debt to equity ratio to represent firm leverage. PRELIB is the pre-liberalization years to represent two years before liberalization. LIB0 is during liberalization dummy variable. POSTLIB is post liberalization dummy variable to represent two years after liberalization. LIBAF is after liberalization variable to represents all years after post liberalization years. Firm is firm specific fixed effect dummies. Sector is sector specific fixed effect dummies. α is constant term**.** The parenthesis under the Hausman test is probability of chi-square value. Fixed effect estimation with consistent standard error is the estimation method. The consistent standard error is in parenthesis. WS is whole sample dataset. SS is sub sample dataset that contains only the firms that have observation before and after 1987 *, **, *** represents the statistically significant at 10%, 5%, and 1% respectively

Firm Performance	**(11)**		**(12)**	
(TOBINQ)	**WS**	**SS**	**WS**	**SS**
Firm Fixed Effect				
MKTSHARE			11.4166	3.5946
			(7.6841)	(2.4505)
DEBTEQ			-0.0005	0.0002
			(0.0005)	(0.0003)
LNSL			-0.0316	0.0547***
			(0.0368)	(0.0112)
PRELIB	0.0620	0.0360	0.0057	0.0802
	(0.0623)	(0.0607)	(0.0739)	(0.0662)
LIB0	2.0199***	2.0092***	2.0454***	2.1231***
	(0.5558)	(0.5576)	(0.7088)	(0.6844)
POSTLIB	1.5389***	1.1752***	1.2886***	1.1833***
	(0.1276)	(0.1265)	(0.1317)	(0.1311)
LIBAF	0.5929***	0.5607***	0.5753***	0.5514**
	(0.0445)	(0.0528)	(0.0431)	(0.0518)
D97	-0.3027**	-0.2180***	-0.1617	-0.2241***
	(0.1353)	(0.0761)	(0.1759)	(0.0644)
LIB0-PRELIB	1.9579***	1.9731***	2.0397***	2.0429***
	(0.5573)	(0.5581)	(0.6906)	(0.6728)
POSTLIB-PRELIB	1.4769***	1.1391***	1.2829***	1.1031***
	(0.1366)	(0.1365)	(0.1434)	(0.1414)

Firm Performance (TOBINQ)	**(11)** **WS**	**SS**	**(12)** **WS**	**SS**
LIBAF-PRELIB	0.5310*** (0.0730)	0.5247*** (0.0756)	0.5695*** (0.0799)	0.4712*** (0.0796)
Hausman test	86868.88 (0.0000)		36.89 (0.0000)	22.07 (0.0048)
Number of OBS	4709	2162	4213	2024
Number of Group	465	116	429	116
R^2	0.4737	0.5645	0.5459	0.5683
Sector Fixed Effect				
MKTSHARE			13.1025** (6.5304)	2.6363* (1.4734)
DEBTEQ			-0.0008* (0.0005)	0.0001 (0.0002)
LNSL			0.0759*** (0.0037)	0.0629*** (0.0121)
PRELIB	0.0283 (0.0818)	0.1046*** (0.0571)	0.0168 (0.0809)	0.0726 (0.0552)
LIB0	1.9877*** (0.5604)	2.0798*** (0.5748)	2.0707*** (0.7018)	2.1361*** (0.7024)
POSTLIB	1.6073*** (0.1452)	1.2712*** (0.1364)	1.3540*** (0.1435)	1.1971*** (0.1393)
LIBAF	0.7751*** (0.0597)	0.6586*** (0.0580)	0.6476*** (0.0437)	0.5782*** (0.0553)
D97	-0.1574*** (0.1119)	-0.1486** (0.0673)	-0.1202 (0.1724)	-0.2553*** (0.0501)
LIB0-PRELIB	1.9595*** (0.5580)	1.9752*** (0.5703)	2.0539*** (0.6960)	2.0635*** (0.6930)
POSTLIB-PRELIB	1.5790*** (0.1473)	1.1665*** (0.1446)	1.3371*** (0.1519)	1.1245*** (0.1486)
LIBAF-PRELIB	0.7468*** (0.0765)	0.5540*** (0.0742)	0.6308*** (0.0822)	0.5055*** (0.0749)
Hausman test			7.75 (0.3554)	
Number of OBS	4709	2162	4213	2024
Number of Group	31	22	31	22
R^2	0.3125	0.5123	0.4313	0.5228

Table 23
The During, Post, and After Effects of the 1987 Stock Market Liberalization on Firm Performance (ROA)

$$ROA_{it} = FIRM_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (13a)$$

$$ROA_{it} = SECTOR_i + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (13b)$$

$$ROA_{it} = FIRM_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (14a)$$

$$ROA_{it} = SECTOR_i + \tau_1 MKTSHARE_{it-1} + \tau_2 DEBTEQ_{it-1} + \tau_3 LNSL_{it} + \eta PRELIB + \delta_2 LIB0 + \delta_3 POSTLIB + \delta_4 LIBAF + \Theta_4 D97 + e_{it} \quad (14b)$$

are used to evaluate the during, post, and after effect of 1987 stock market liberalization on firm performance. ROA is firm return on asset to measure firm performance. MKTSHARE is firm market share. It is firm's market capitalization divided by total market capitalization. LNSL is log of sales to represent firm size. DEBTEQ is firm debt to equity ratio to represent firm leverage. PRELIB is the pre-liberalization year to represent two years before liberalization. LIB0 is during liberalization dummy variable. POSTLIB is post liberalization dummy variable to represent two years after liberalization. LIBAF is after liberalization variable to represents all years after post liberalization years. Firm is firm specific fixed effect dummies. Sector is sector specific fixed effect dummies. α is constant term**.** The parenthesis under the Hausman test is probability of chi-square value. Fixed effect estimation with consistent standard error is the estimation method. WS is whole sample dataset. SS is sub sample dataset that contains only the firms that have observation before and after 1987. The consistent standard error is in parenthesis. *, **, *** represents the statistically significant at 10%, 5%, and 1% respectively

Firm Performance	**(13)**		**(14)**	
(ROA)	**WS**	**SS**	**WS**	**SS**
Firm Fixed Effect				
MKTSHARE			0.3014***	0.2651***
			(0.0636)	(0.0653)
DEBTEQ			-2.4e-04	-0.0001
			(5.11e-04)	(0.0001)
LNSL			0.0101***	0.0030***
			(0.0022)	(0.0008)
PRELIB	0.0062	0.0022	0.0142**	0.0060
	(0.0043)	(0.0042)	(0.0057)	(0.0053)
LIB0	0.0397***	0.0407***	0.0463***	0.0375***
	(0.0072)	(0.0089)	(0.0071)	(0.0066)
POSTLIB	0.0680***	0.0440***	0.0570***	0.0448***
	(0.0086)	(0.0046)	(0.0052)	(0.0050)
LIBAF	0.0419***	0.0308***	0.0437***	0.0309***
	(0.0033)	(0.0033)	(0.0034)	(0.0034)
D97	-0.0270***	-0.0337***	-0.0287***	-0.0357***
	(0.0084)	(0.0111)	(0.0080)	(0.0111)
LIB0-PRELIB	0.0335***	0.0385***	0.0321***	0.0315***
	(0.0080)	(0.0093)	(0.0075)	(0.0073)
POSTLIB-PRELIB	0.0618***	0.0419***	0.0428***	0.0388***
	(0.0086)	(0.0054)	(0.0061)	(0.0061)

Firm Performance (ROA)	**(13)**		**(14)**	
	WS	**SS**	**WS**	**SS**
LIBAF-PRELIB	0.0358***	0.0287***	0.0295***	0.0249***
	(0.0048)	(0.0043)	(0.0054)	(0.0050)
Hausman test	83.18	73.22	91.83	180.07
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Number of OBS	5564	2465	4244	2040
Number of Group	469	116	430	116
R^2	0.3442	0.4476	0.4556	0.4949
Sector Fixed Effect				
MKTSHARE			0.3597***	0.1449***
			(0.0691)	(0.0402)
DEBTEQLAG			-0.0001	-0.0001
			(0.0001)	(0.0001)
LNSL			0.0029***	0.0024***
			(0.0004)	(0.0005)
PRELIB	0.0145***	0.0048	0.0115**	0.0021
	(0.0045)	(0.0045)	(0.0053)	(0.0052)
LIB0	0.0465***	0.0434***	0.0445***	0.0351***
	(0.0075)	(0.0091)	(0.0063)	(0.0061)
POSTLIB	0.0729***	0.0468***	0.0566***	0.0453***
	(0.0094)	(0.0049)	(0.0049)	(0.0051)
LIBAF	0.0504***	0.0337***	0.0421***	0.0316***
	(0.0031)	(0.0038)	(0.0037)	(0.0039)
D97	-0.0243***	-0.0290**	-0.0189***	-0.0320***
	(0.0088)	(0.0126)	(0.0090)	(0.0126)
LIB0-PRELIB	0.0320***	0.0386***	0.0329***	0.0330***
	(0.0084)	(0.0096)	(0.0077)	(0.0072)
POSTLIB-PRELIB	0.0585***	0.0420***	0.0451***	0.0432***
	(0.0102)	(0.0059)	(0.0066)	(0.0065)
LIBAF-PRELIB	0.0359***	0.0289***	0.0306***	0.0295***
	(0.0049)	(0.0049)	(0.0057)	(0.0055)
Hausman test				42.38
				(0.0000)
Number of OBS	5564	2465	4244	2040
Number of Group	31	22	31	22
R^2	0.1299	0.3338	0.1438	0.3521

APPENDIX B

Figure 1
The Mean Value of Firm Main Board Share Price from 1976 to 2003

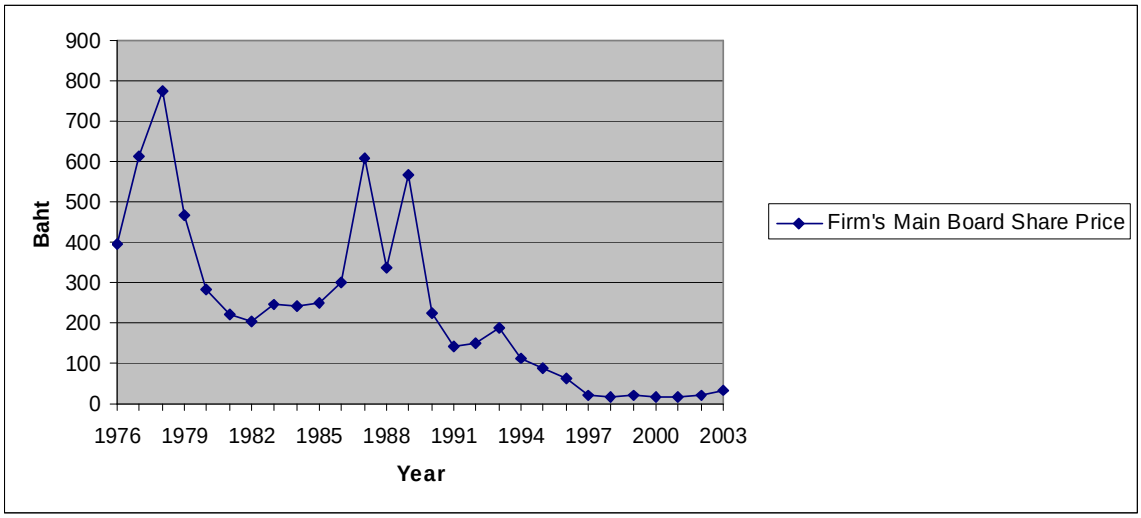


Figure 2
The Mean Value of the Firm Main Board Stock Return and the Firm Alien Board Stock Return from 1987 to 2003

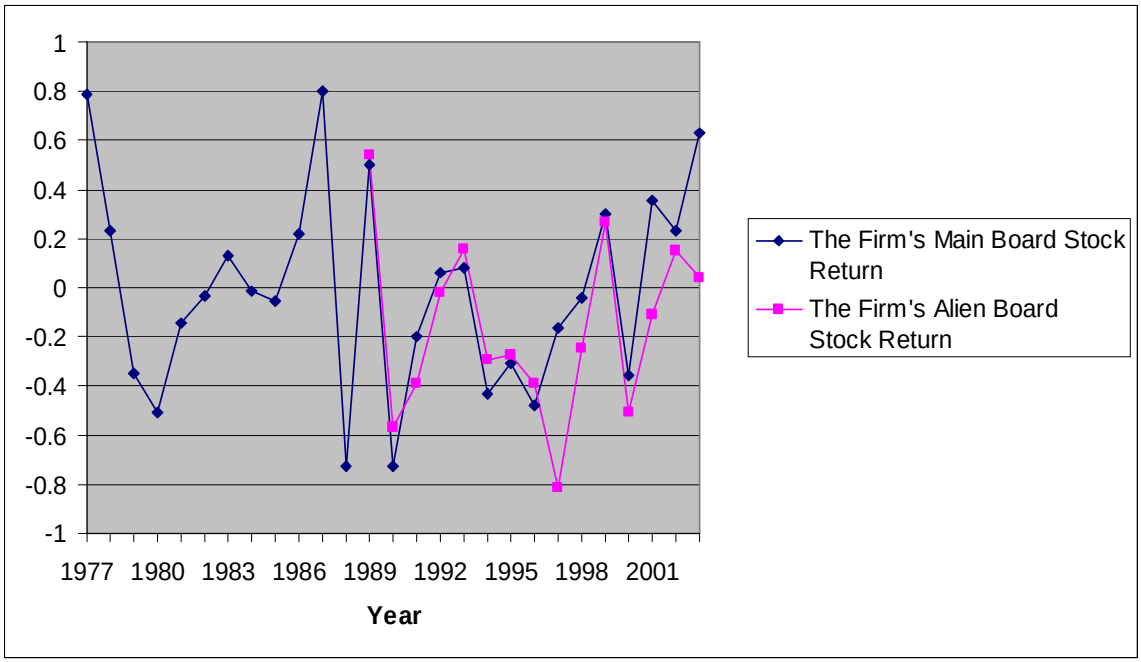


Figure 3
The Mean Value of Firm Main Board Share Price in 1985 and 1987 Liberalization Years

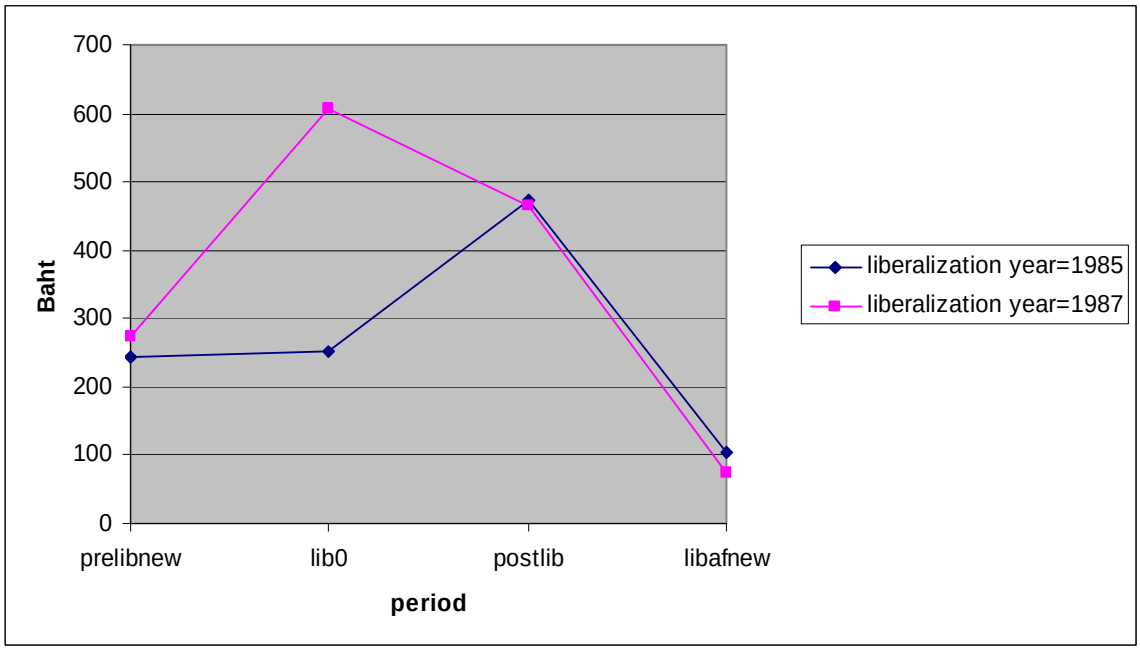


Figure 4
The Mean Value of the Firm Main Board Stock Return in 1985 and 1987 liberalization Years

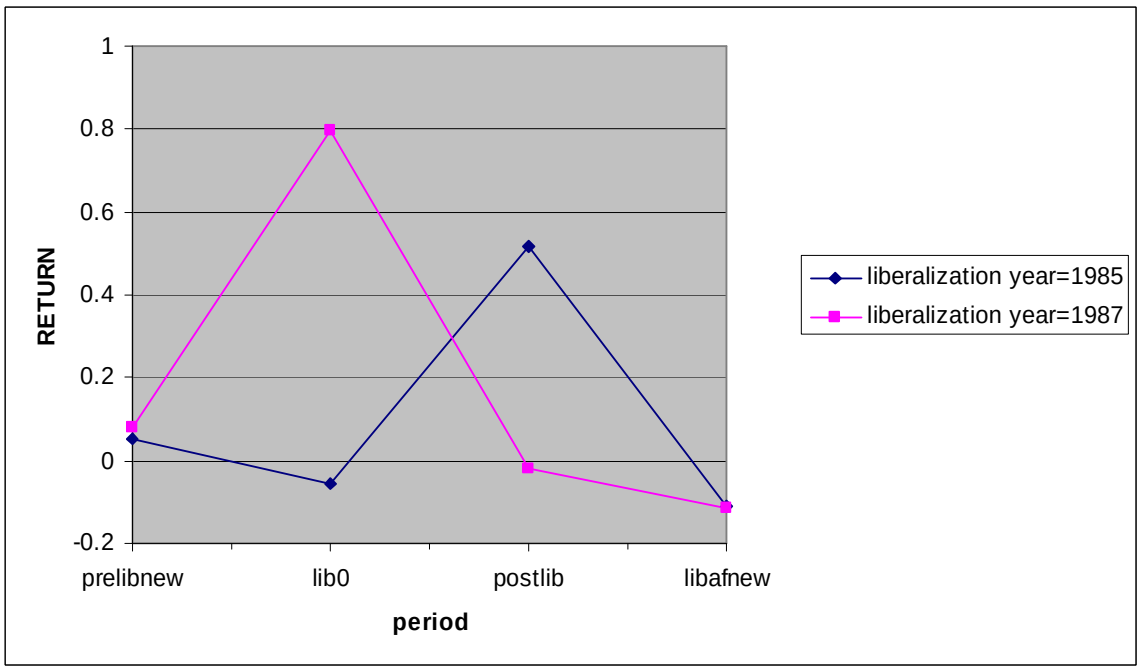


Figure 5
The Mean Value of Firm Main Board Share Price and Alien Board Share Price

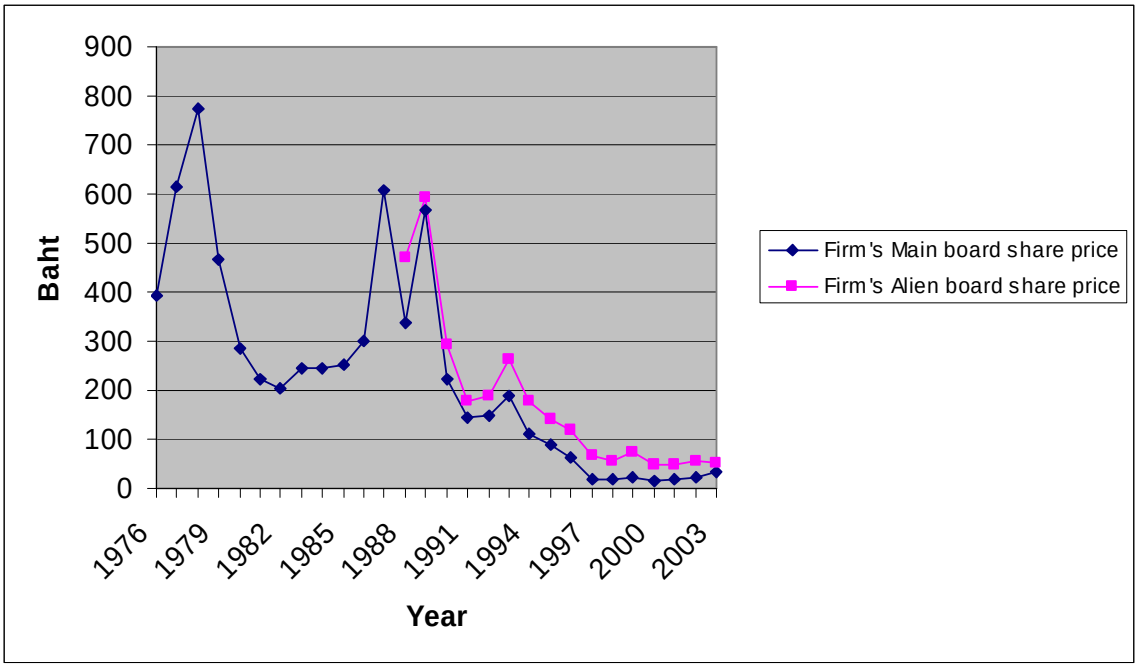


Figure 6
The Mean Value of the Firm Main Board and Alien Board Share Price When the Liberalization Dates Change

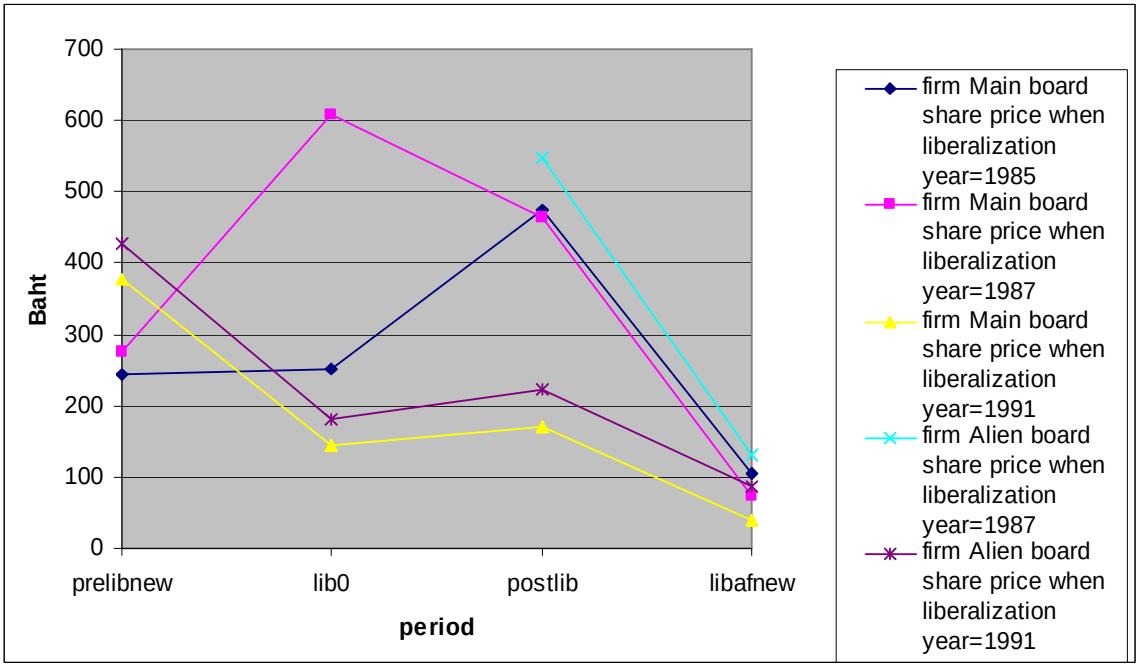


Figure 7
The Mean Value of the Firm Main Board Stock Return and the Firm Alien Board Stock Return When the Liberalization Year Changes

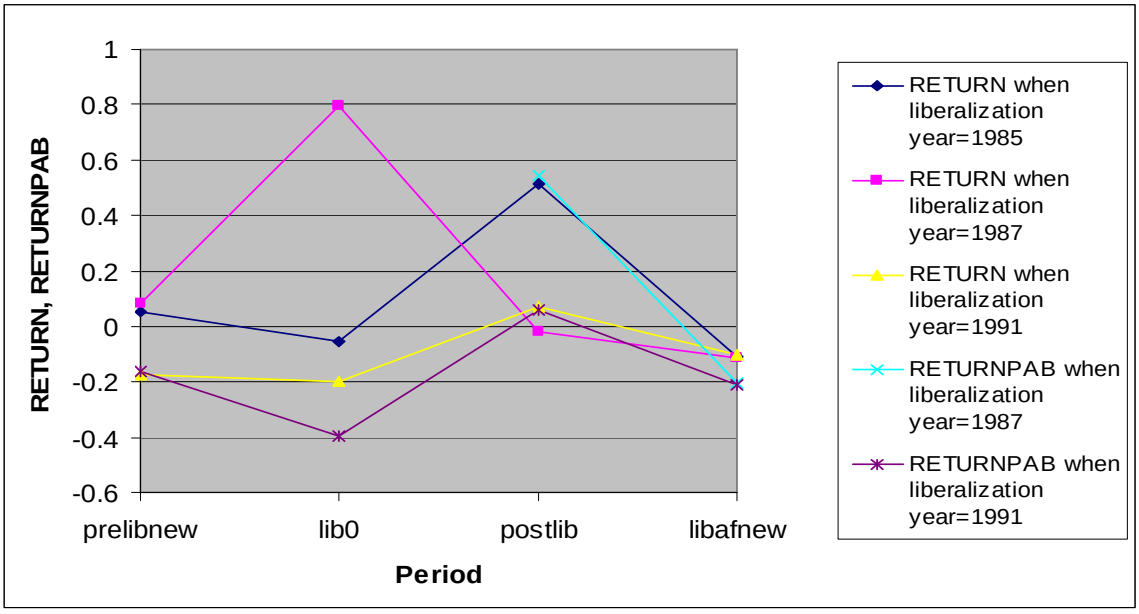


Figure 8
The Mean Value of the Firm Investment from 1976 to 2003

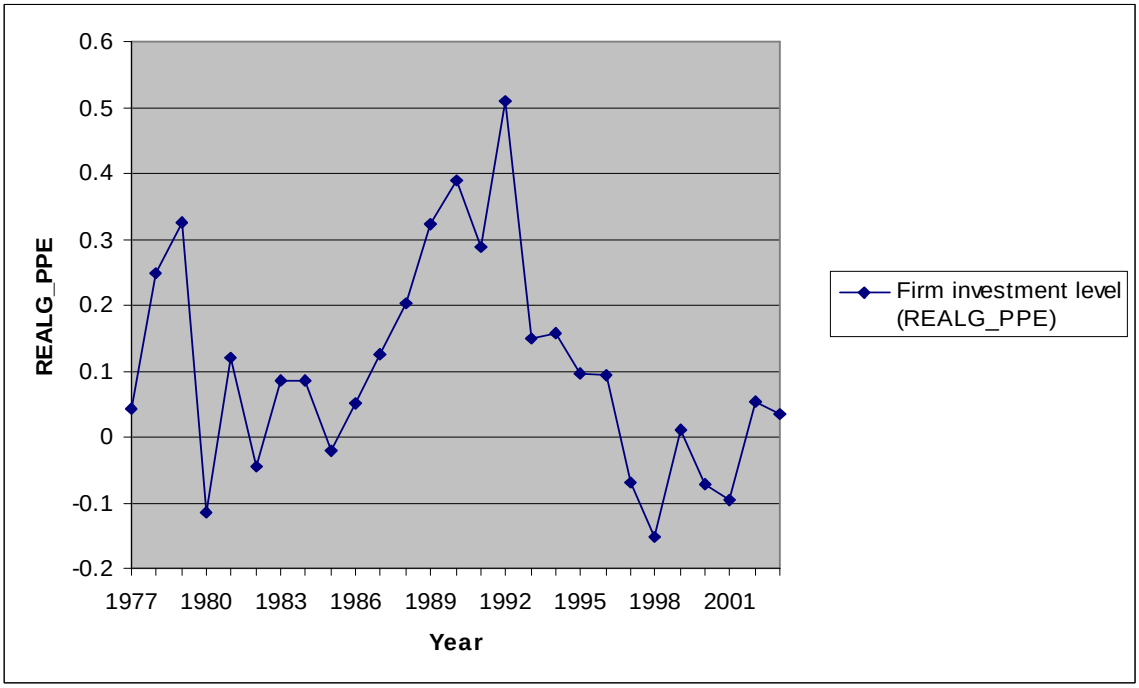


Figure 9
The Mean Value of Firm Cost of Capital (DIV) from 1976 to 2003

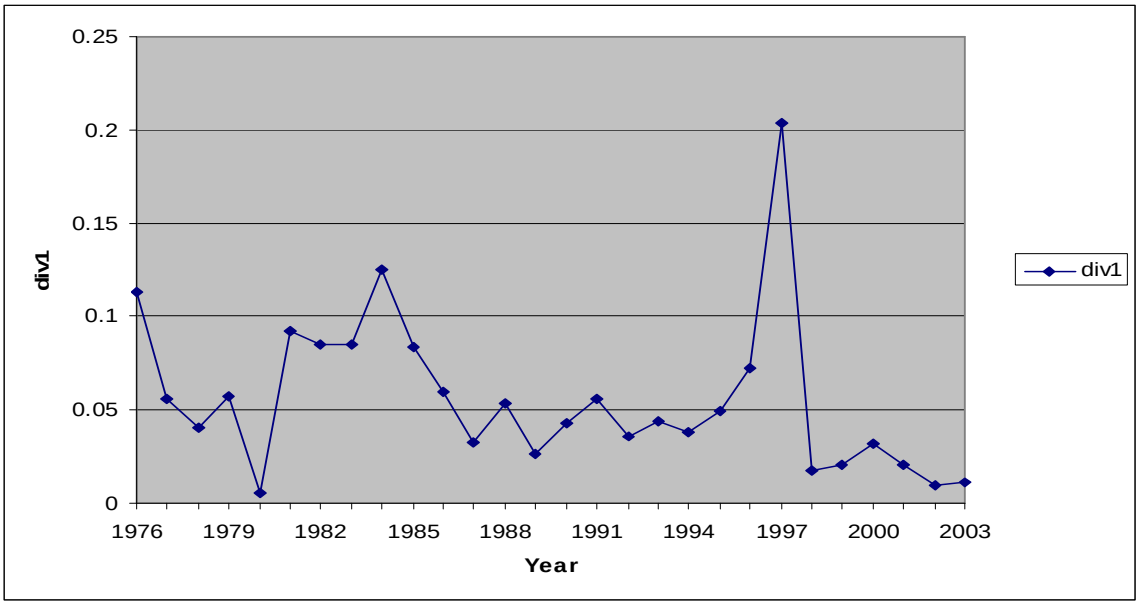


Figure 10
The Mean Value of the Firm Investment (REALG_PPE) and the Firm Cost of Capital (DIV) from 1977 to 2003

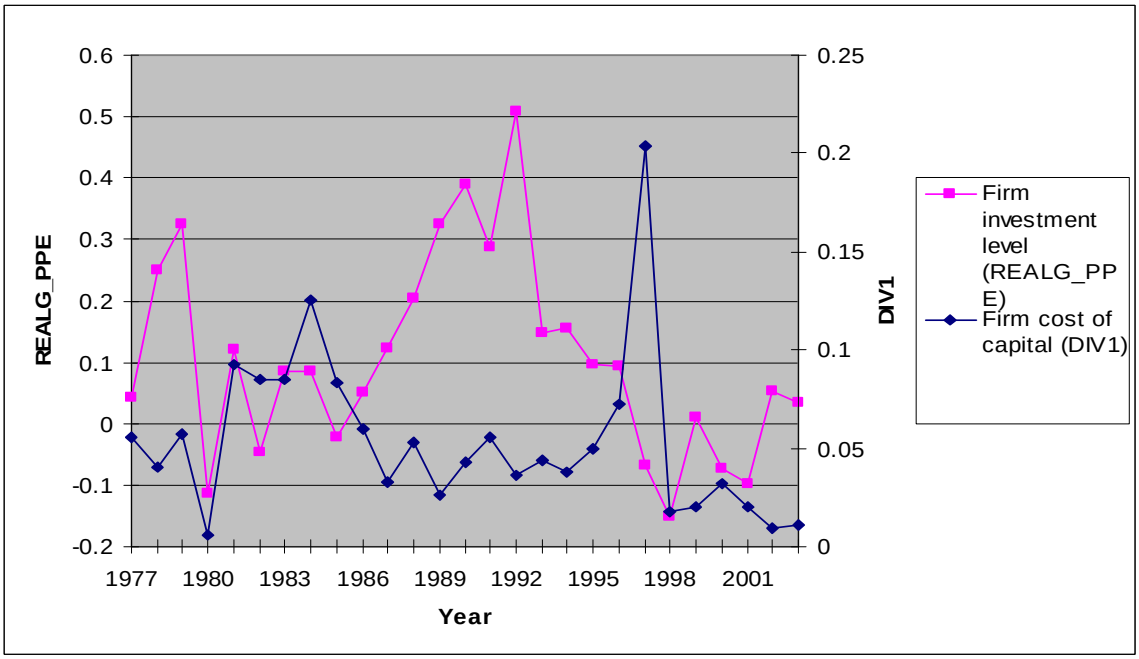


Figure 11
The Mean Value of Firm Investment Rate (REALG_PPE) in Different Periods of 1985 and 1987 Stock Market Liberalization

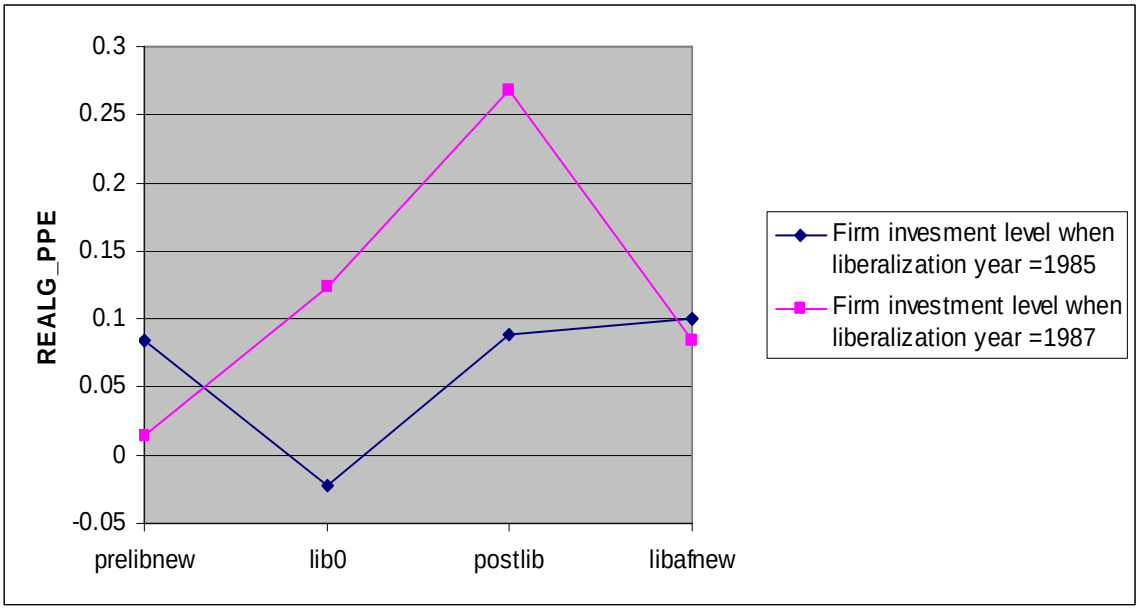


Figure 12
The Mean Value of Firm Cost of Capital (DIV) in Different Periods of 1985 and 1987 Stock Market Liberalization

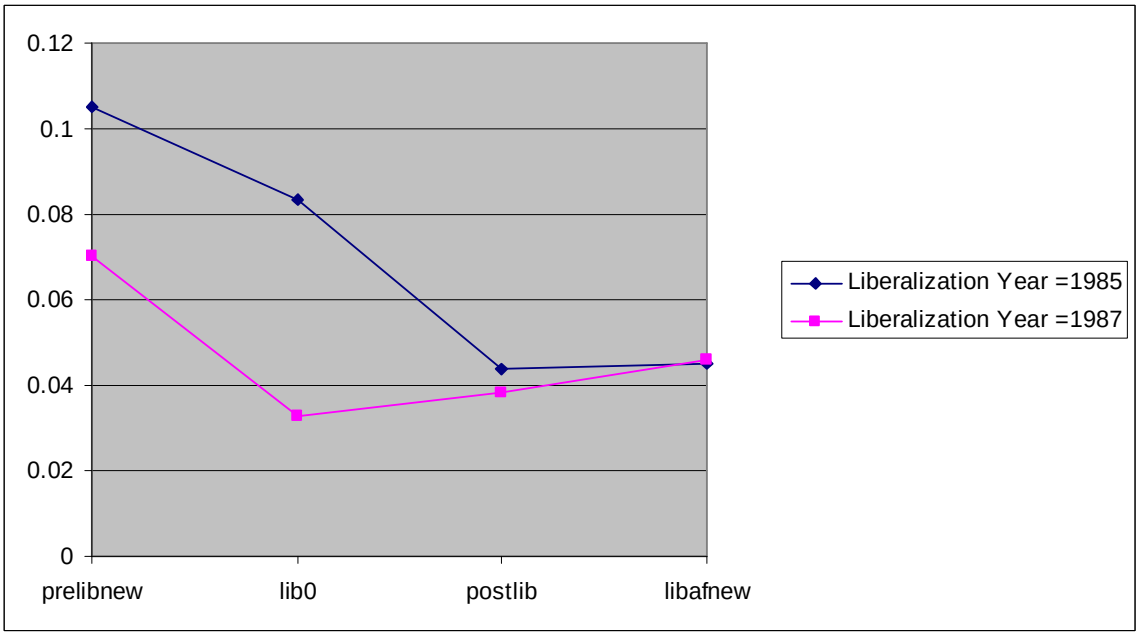


Figure 13
The Mean Value of Firm Performance (TOBINQ) from 1976 to 2003

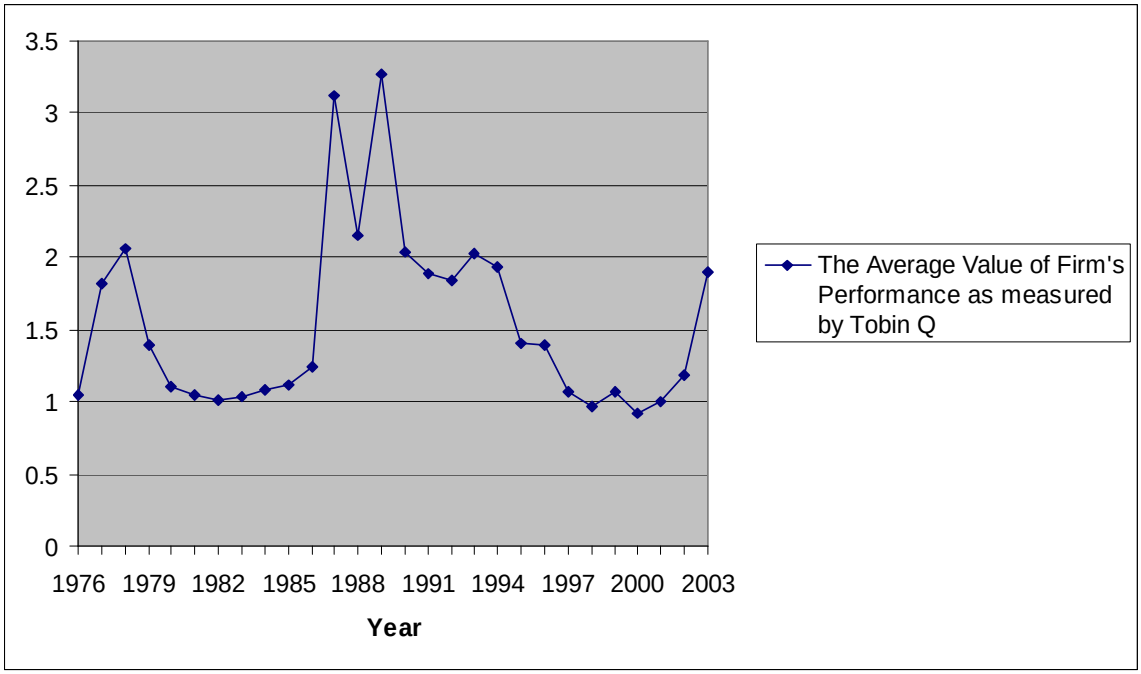
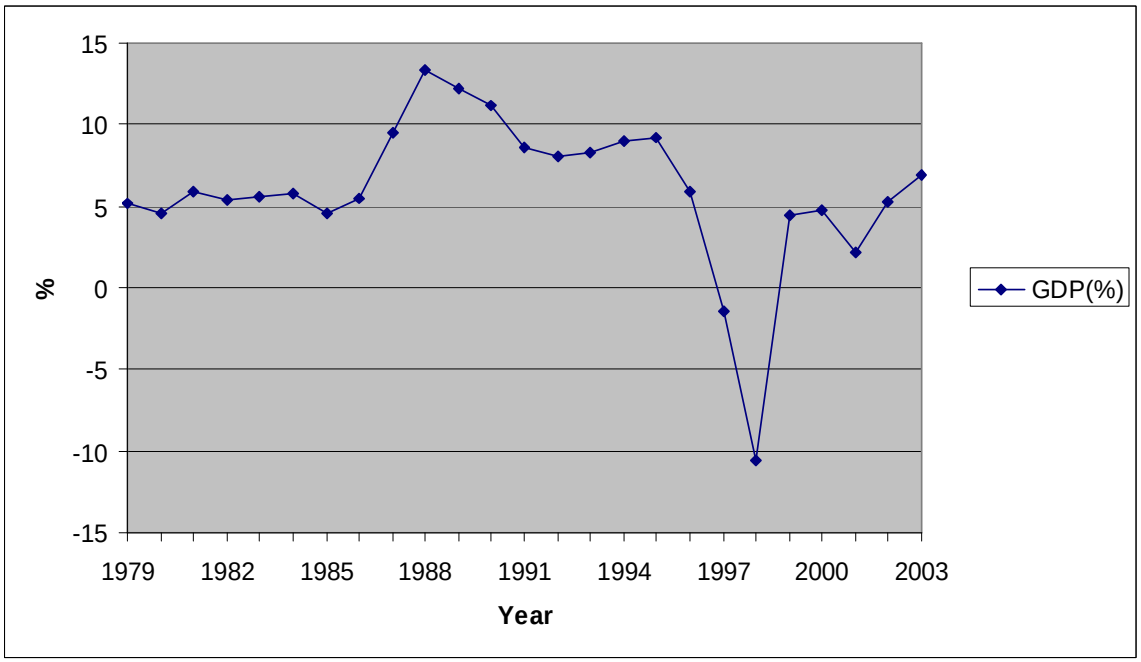
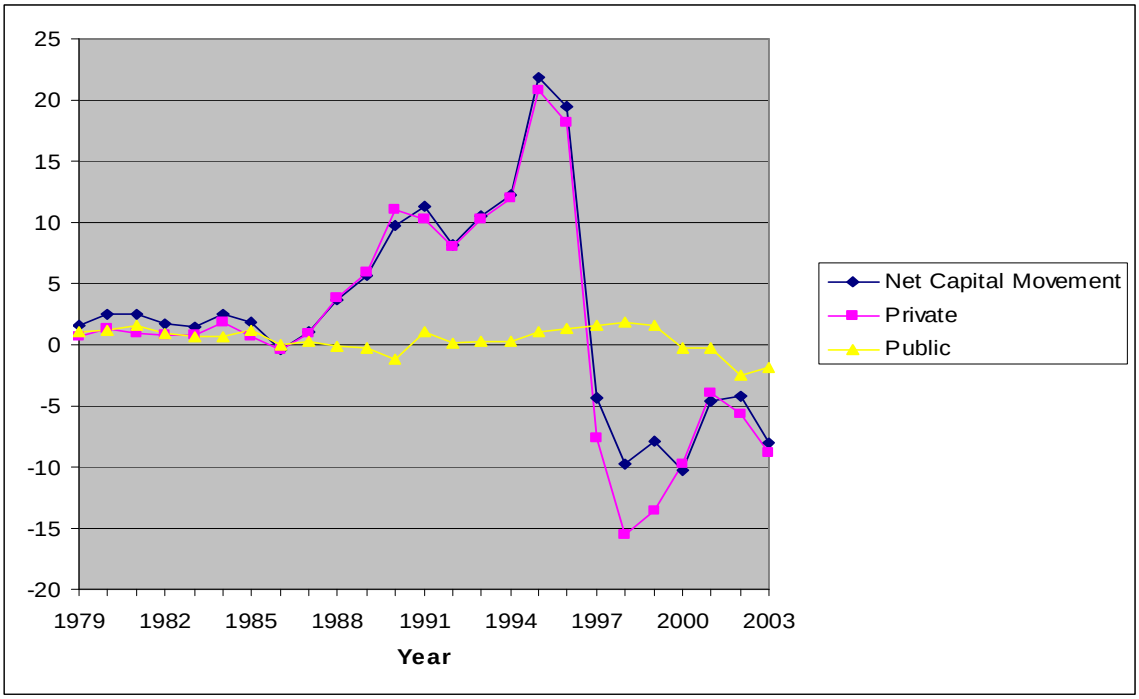


Figure 14
Thailand Gross Domestic Product from 1979 to 2003



Source: Bank of Thailand

Figure 15
Thailand Net Capital Movement from 1979 to 2003



Source: Bank of Thailand

Figure 16
The Mean Value of Firm Rate of Return on Investment from 1976 to 2003

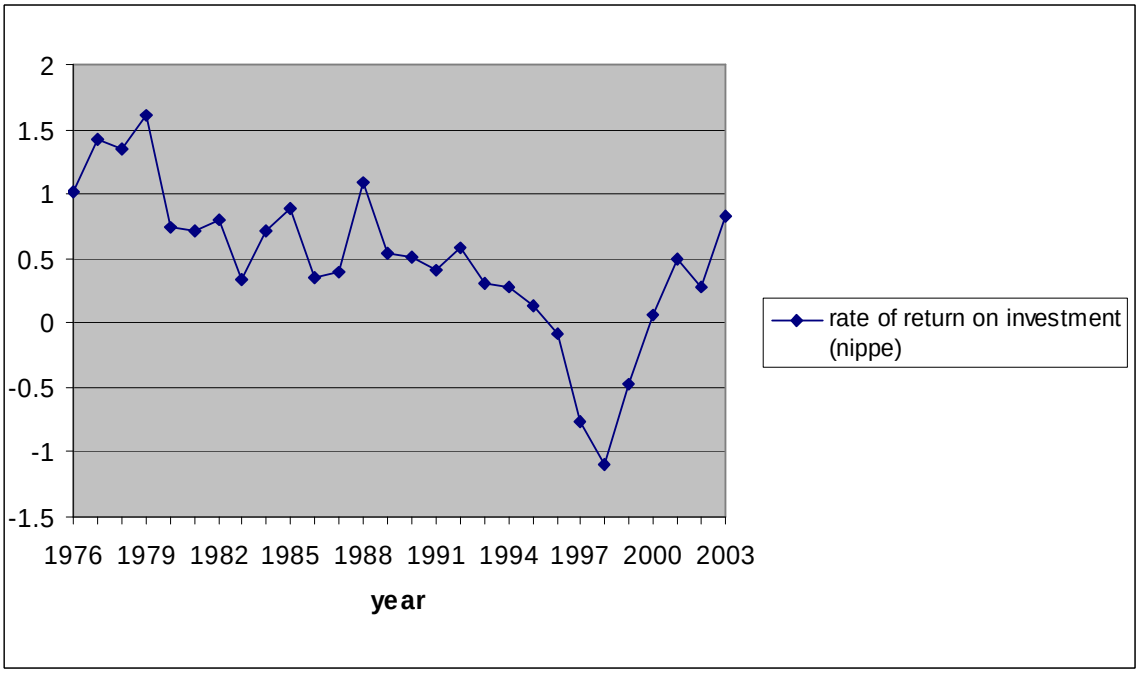


Figure 17
The Mean Value of Firm Return on Asset (ROA) from 1976 to 2003

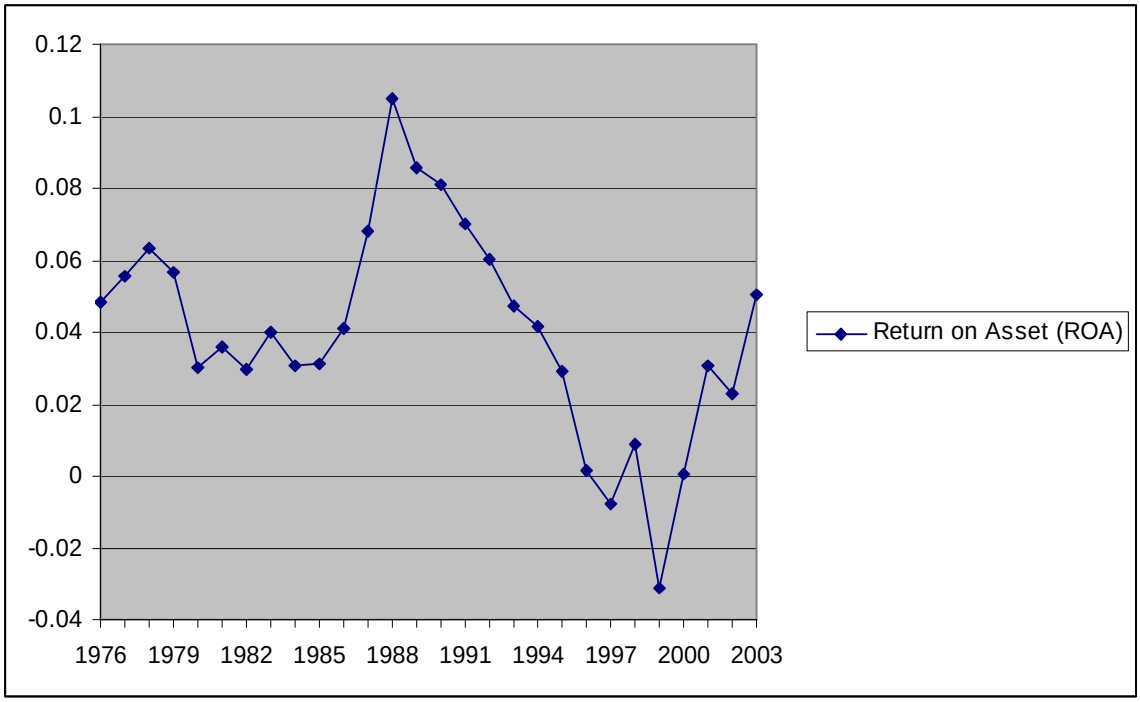


Figure 18
The Mean Value of Firm Debt to Equity Ratio from 1976 to 2003

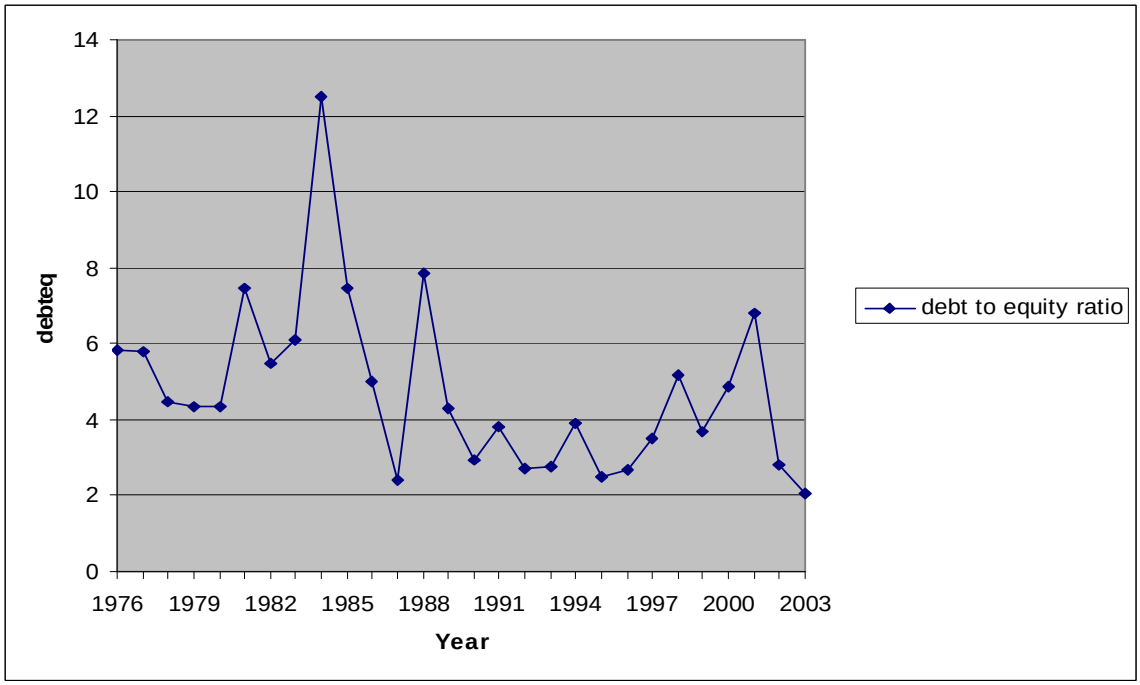


Figure 19
The Average Post 1985 Liberalization Debt to Equity Ratio Compared to Average Pre Liberalization Value Calculated over 1982 to 1984

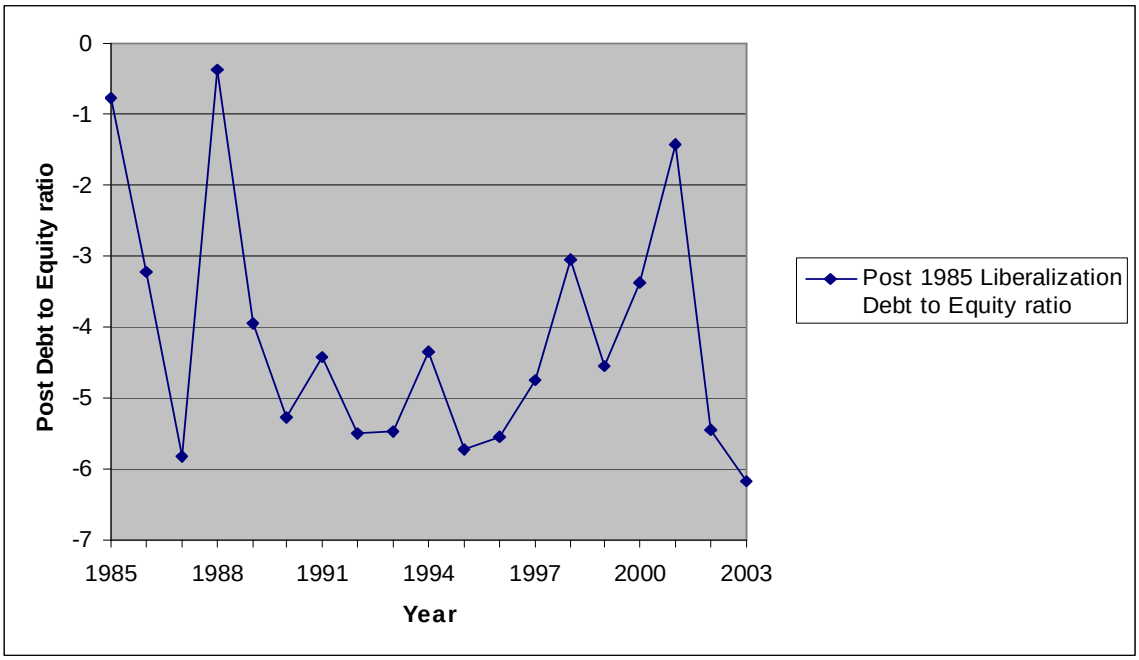


Figure 20
The Average Post 1987 Debt to Equity Ratio Compared to Average Pre Liberalization Value Calculated over 1984 to 1986

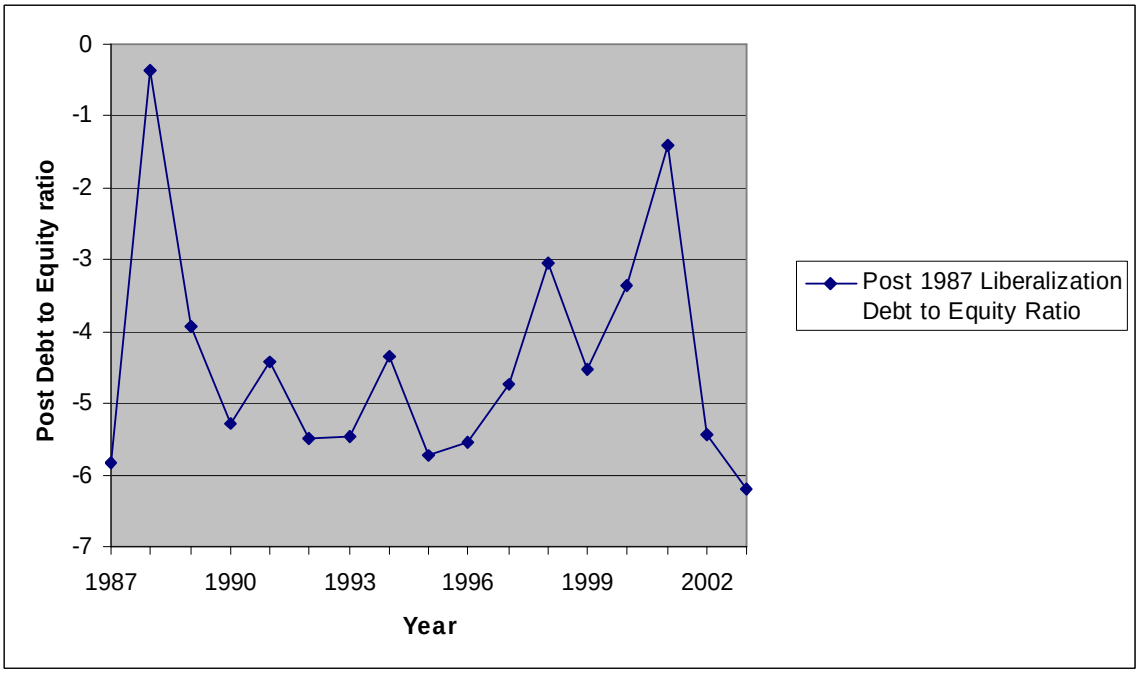


Figure 21
The Mean Value of Firm Performance (TOBINQ) on the Pre, During, Post, and After Periods of the 1985 and 1987 Stock Market Liberalization

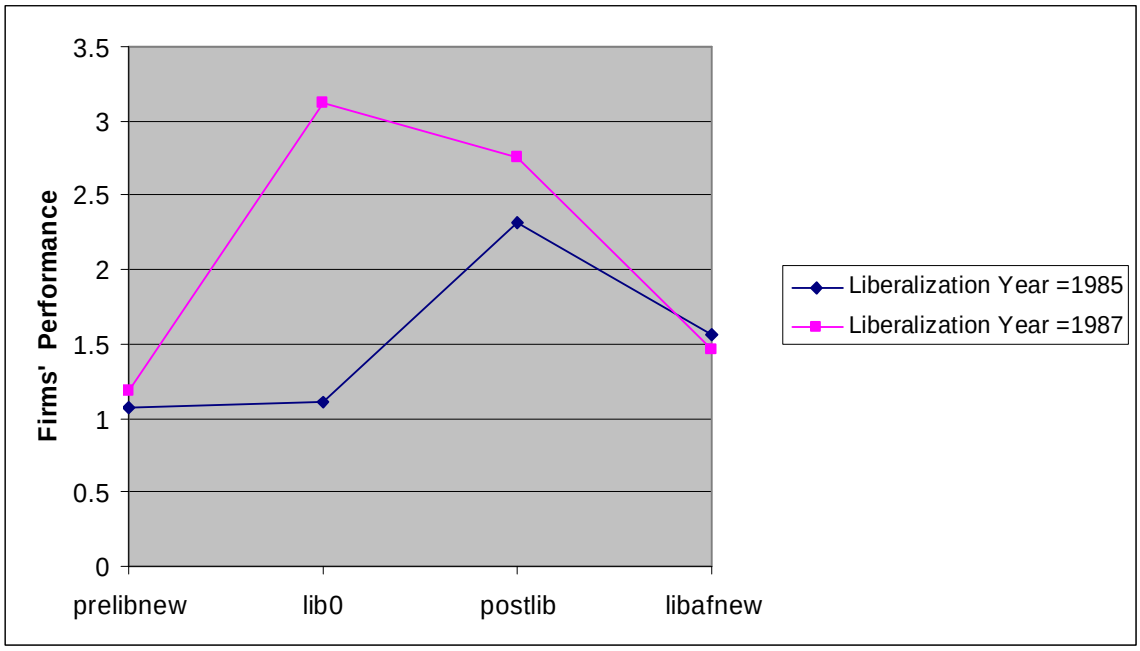
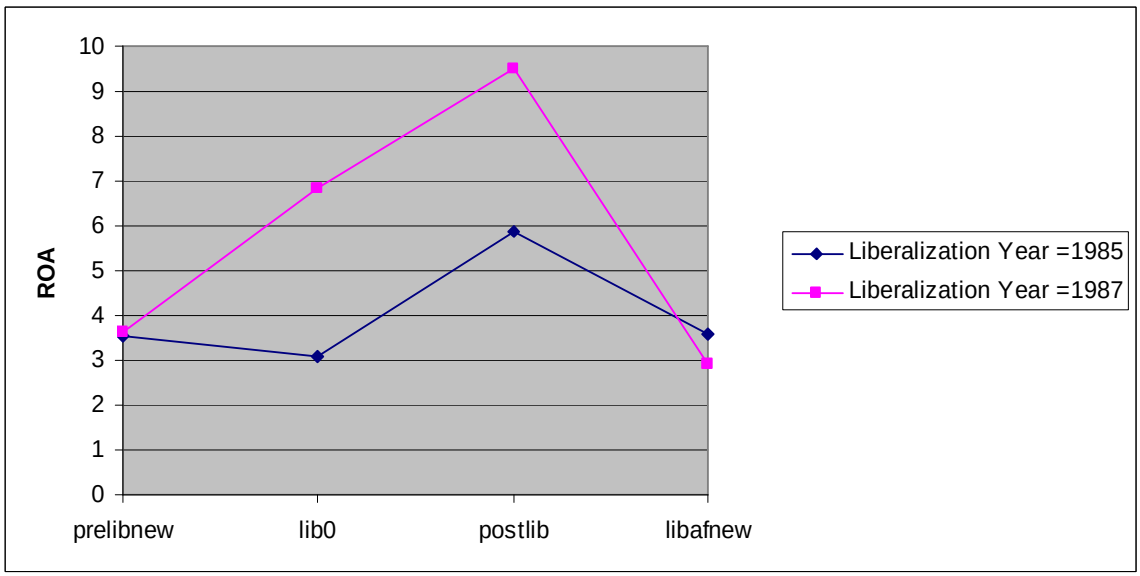


Figure 22
The Mean value of Firm Performance (ROA) on the Pre, During, Post, and After Periods of the 1985 and 1987 Stock Market Liberalization



VITA

Pornpitchaya Kuwalairat

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE IMPACT OF THE STOCK MARKET LIBERALIZATION ON THE FIRM VALUE OF EQUITY, INVESTMENT, AND PERFORMANCE: THE CASE OF THAILAND

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Experience: Employed by Oklahoma State University, Department of Economics and Legal Studies in Business as a teacher assistant, Oklahoma State University, Department of Economics and Legal Studies in Business, 1999 to 2005.

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Institution: Oklahoma State University

Date of Degree: May 2006
Location: Stillwater, Oklahoma

Title of Study: THE IMPACT OF THE STOCK MARKET LIBERALIZATION ON THE FIRM VALUE OF EQUITY, INVESTMENT, AND PERFORMANCE: THE CASE OF THAILAND

Pages in Study: 174

Candidate for the Degree of Doctor of Philosophy

Major Field: Economics

Scope and Methodology of Study: This study was examined the effect of stock market liberalization on the revaluation of the firm Main board and Alien board stock return, investment rate and cost of capital, and performance. Annual firm level data from 1976 to 2003 in the Stock Exchange of Thailand is used. The total number of firms is 469 firms in 31 sectors. 1985, 1987, and 1991 are the stock market liberalization years. The main focus is on the effect of 1987 liberalization. A sub sample dataset as well as the whole dataset are used to identify the liberalization effect. Pre, during, post, and after effects of stock market liberalization are analyzed. Estimations are controlled for firm differences and then for sector differences. The fixed effects estimation and panel generalized least squares are the estimation methods. The Hausman Specification test is used to pick the best estimation method.

Finding and Conclusion: The firm Main board stock return increases from the pre-liberalization level during the 1987 stock market liberalization and declines from that level in the post and after liberalization periods. The firm Main board stock return declines from the pre-liberalization level in both during and after periods of the 1985 liberalization but increases in the post liberalization period. The firm Alien board stock return declines from the pre-liberalization level during the 1991 liberalization but increases in the post liberalization period. A change in firm size in the during, post, and after periods of the 1987, 1985, and 1991 liberalization does not affect the firm Main board and Alien board stock return. Firm investment rate increases from the pre-liberalization level in the post and after periods of the 1987 liberalization. When controlled variables are removed, the 1987 liberalization positively affects the firm investment rate in all liberalization periods. The 1985 stock market liberalization positively affects the firm investment rate only in the after liberalization period. The cost of capital significantly declines from the pre-liberalization level following the 1985 and 1987 liberalization. Firm performance significantly improves in the during, post, and after periods of the 1987 liberalization and significantly improve in both post and after periods of the 1985 liberalization.

ADVISER'S APPROVAL: Andreas Savvides