ส่วนลดของการออกหลักทรัพย์ และการประเมินมูลค่าที่สูงเกินไปของนักลงทุนที่อยู่ในผลตอบแทนเบื้องต้นของการเสนอขายหุ้นสามัญต่อประชาชนทั่วไปในครั้งแรก

นางสาว อฑิตยา กาญจนเมธากุล

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต

สาขาวิชาการเงิน ภาควิชาการธนาคารและการเงิน

คณะพาณิชยศาสตร์และการบัญชี จุฬาลงกรณ์มหาวิทยาลัย

ปีการศึกษา 2553

ISSUE DISCOUNT AND INVESTOR OVEROPTIMISM IN IPO INITIAL RETURN

Miss Athitaya Kanjanamethakul

A Thesis Submitted in Partial Fulfillment of the Requirements

for the Degree of Master of Science Program in Finance

Department of Banking and Finance

Faculty of Commerce and Accountancy

Chulalongkorn University

Academic Year 2010

Thesis Title	ISSUE DISCOUNT AND INVESTOR OVEROPTIMISM IN IPO INITIAL RETURN
By	Miss Athitaya Kanajamethakul
Field of Study	Finance
Thesis Advisor	Manapol Ekkayokkaya, Ph.D.

Accepted by the Faculty of Commerce and Accountancy, Chulalongkorn University in Partial Fulfillment of the Requirements for the Master's Degree

..... Dean of the Faculty of Commerce and Accountancy

(Associate Professor Annop Tanlamai, Ph.D.)

THESIS COMMITTEE

..... Chairman

(Ruttachai Seelajaroen, Ph.D.)

..... Thesis Advisor

(Manapol Ekkayokkaya, Ph.D.)

..... External Examiner

(Win Udomrachtavanich, Ph.D.)

อทิตยา กาญจนเมธากุล: ส่วนลดของการออกหลักทรัพย์ และการประเมินมูลค่าที่สูงเกินไปของนักลงทุนที่อยู่ในผลตอบแทนเบื้องต้นของการเสนอขายหุ้นสามัญต่อประชาชนทั่วไปครั้งแรก (ISSUE DISCOUNT AND INVESTOR OVEROPTIMISM IN IPO INITIAL RETURN) อ.ที่ปรึกษาวิทยานิพนธ์หลัก:อ.ดร. มนพล เอกโยคยะ ,86 หน้า.

วิทยานิพนธ์ฉบับนี้มีวัตถุประสงค์เพื่อทดสอบว่าอัตราผลตอบแทนเบื้องต้นของการเสนอขายหุ้นสามัญต่อประชาชนทั่วไปครั้งแรกแสดงถึงส่วนลดของการออกหลักทรัพย์ หรือการประเมินมูลค่าที่สูงเกินไปของนักลงทุนหรือไม่ กลุ่มตัวอย่างคือบริษัทที่จดทะเบียนในตลาดหลักทรัพย์ลอนดอนตั้งแต่ปี พ.ศ. 2534-2548 ประสิทธิภาพในการดำเนินงานหลังจากออกหลักทรัพย์ถูกวัดจากการปรับปรุงผลการดำเนินงานโดยผลการดำเนินงานของบริษัทในอุตสาหกรรม และการวิเคราะห์การถดถอยพหุคูณ สำหรับประสิทธิภาพระยะยาวของราคาหุ้นถูกวัดโดยวิธีการตามระยะเวลาของเหตุการณ์, วิธีการตามระยะเวลาของปีปฏิทิน และการวิเคราะห์การถดถอยพหุคูณ โดยข้อมูลจะถูกแบ่งออกเป็น 5 กลุ่มด้วยระดับของอัตราผลตอบแทนเบื้องต้น ทั้งนี้เพื่อที่จะศึกษาข้อมูลของกลุ่มตัวอย่างที่อยู่ในกลุ่มระดับอัตราผลตอบแทนสูงสุด และต่ำสุด ซึ่งผลจากการศึกษาไม่สอดคล้องกับสมมติฐาน และอัตราผลตอบแทนเบื้องต้นไม่มีความสัมพันธ์กับประสิทธิภาพในการดำเนินงานหลังจากออกหลักทรัพย์ และประสิทธิภาพระยะยาวของราคาหุ้น ดังนั้นอัตราผลตอบแทนเบื้องต้นจึงไม่ได้เป็นสัญญาณบอกถึงคุณภาพของผู้ออกหลักทรัพย์และประสิทธิภาพของราคาหุ้น ดังนั้นผลการศึกษานี้จึงไม่สอดคล้องกับการศึกษาที่ผ่านมาในตลาดหุ้นสหรัฐอเมริกา

ภาควิชา การธนาคารและการเงิน ลายมือชื่อนิสิต Atip K

สาขาวิชา การเงิน ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก

ปีการศึกษา 2553

5082217826 : MAJOR FINANCE

KEYWORDS : INITIAL RETURN / ISSUE DISCOUNT / AFTERMARKET DEMAND

ATHITAYA KANJANAMETHAKUL: ISSUE DISCOUNT AND INVESTOR OVEROPTIMISM IN IPO INITIAL RETURN. THESIS ADVISOR: MANAPOL EKKAYOKKAYA, PH.D., 86 pp.

The objective of this thesis is to investigate whether the initial return of IPO reflects the issue discount by issuer or the overoptimism of investor. Sample used in this study is the listed firms in London Stock Exchange (LSE) during 1991-2005. Regarding the post-issue operating performance measurement, we apply the industry adjusted performance and the multivariate regression. For the long-run stock price performance measurement, we apply the event-time approach, the calendar-time approach and the multivariate regression. The data is divided by the initial return level into five levels in order to study the highest and the lowest group of initial return. The evidences do not support our hypotheses, and the initial return does not have the relation with the post-issue operating performance and the long-run stock price performance. So the initial return is not the signal of the issuer's quality and the stock price performance. Then these evidences are not consistent with the previous studies in the U.S stock market.

Department : Banking and Finance Student's Signature .....

Field of Study : Finance Advisor's Signature .....

Academic Year : 2010

Acknowledgements

I would like to express my gratitude to all those who gave me the possibility to complete this thesis. First of all, I want to thank the Department of Banking and Finance for giving me permission to commence this thesis in the first instance, to do the necessary research work and to use departmental data.

My most heartfelt thanks to Manapol Ekkayokkaya, Ph.D. for his wealth of knowledge, for the continuous support, for his patience, motivation, enthusiasm, valuable hints in giving this thesis its depth, guidance from very early stage of my research, and an encouragement to go ahead when I thought it was a dead end. Also, I feel so deeply grateful for his attentive teaching about research design and methods, academic writing, and data analysis

Besides my advisor, my gratitude also goes to my thesis committee: Ruttachai Seelajaroen, Ph.D., and Win Udomrachtavanich, Ph.D. for taking time to study my Thesis, for their encouragement, detailed, insightful comments, which made me attend to work harder for the better outcome.

Finally, I want to thank my beloved family for their unwavering love and wisdom when I needed it the most, for their never stop believing in me, including their anticipating my needs before even I knew them. Their unflinching courage and conviction will always inspire me; it is to them that I dedicate this work.

Contents

List of Tables

Page

Chapter I

Introduction

1.1 Background of the Study

The first time that a company decides to issue the new common stocks publicly is called the initial public offering (or IPO). A prospectus is issued for inviting investors to buy the first issue of shares in the company. The difference between the first-day closing price and the offered price of IPO (before trading in secondary markets) is first-day initial return. In this study we call the first-day initial return as "**initial return**".

Because the initial return of IPO remains to exist in the market, the previous studies define the meaning of initial returns of IPOs into two different meanings between issue discount by issuer and aftermarket demand of investors. Ritter and Welch (2002) document that the term of initial return and underpricing (or issue discount) is used interchangeably. Grinbatt and Hwang (1989) also suggest that the initial return reflects the issue discount, while Lowry (2003) claims that the aftermarket demand of investors plays an important role for the decision to go public. Especially when the aftermarket demand is strong and the investors are willing to pay more for the new issue than its true value. Many firms will seek this opportunity and try to go public because of the lower cost of going public. This evidence represents that the strong aftermarket demand of investor has an important effect to the initial return of IPO.

The issue discount is the action that a company decides to issue the IPO and offers it at the discount price from the intrinsic value. The higher level of issue discount reflects the higher initial return, because the offered price is lower than its intrinsic value. While the aftermarket demand of investor is an indicator of the overoptimism of investor, the higher level of the overoptimism of investor reflects the higher aftermarket demand of investor. The aftermarket demand of investors is the demand of investors for the listed IPOs, this action will affect to the stock price. If the aftermarket demand is high, the stock price will be high. So the initial return will be high. Then the initial returns may reflect the issue discount by issuers or the aftermarket demand of investors. However many studies try to study about the motivation of the issue discount by issuer and the aftermarket demand of investors.

The asymmetry information is the main reason of the motivation for discounting the new issue. Rock (1986) affirms that the issue discount is the compensation to investors for the cost of becoming informed. The higher risk companies should discount the IPO at a higher level. Allen and Faulhaber (1989), and Grinbatt and Hwang (1989) claim that the issue discount is the signal mechanism of the issuers to send their information about the firms' performance to investors. They document that the high-quality issuers use the issue discount as the mechanism to distinguish themselves from the low-quality issuers.

However many studies study about the motivation of the aftermarket demand of investors. For example, Rajan and Servaes (1997) document that the analysts tend to be the overoptimists about the earnings growth projection of IPO firms. They also find that many investors appear to believe the analysts' projections. Eventually, this reason leads to the high aftermarket demand of investors.

Although the IPOs always have the first-day initial returns, but their initial returns are not equal. Ritter (1984) states that the mean of first-day initial returns of IPO during 1984 is higher than the mean of first-day initial return during 1977-82. It stands to the point that this unequally of initial returns should possibly contain some different information about the issuers' quality or their stocks. If the difference does not contain any information, every IPO should have the initial return equally. Because of this reason, the action of the issue discount by issuers and aftermarket demand of investors should contain some information about the issuers' quality and their stocks too.

The issue discount does not only affect to the initial returns of IPOs. The previous studies suggest that the issue discount is the signal about the issuers' quality and their stocks performance. So many studies try to study the relation of the issue discount with the post-issue firm's operating performance, and the long-run stock price performance. From the investigation of Allen and Faulhaber (1989), and Grinbatt and Hwang (1989), the issue discount by the issuer has a positive relation with the post-issue operating performance of the issuers. Ritter (1984) claims that there is a positive significantly statistical correlation between the price variability of new issue in the aftermarket and the issue discount level.

Many studies try to conclude that the initial return reflects the aftermarket demand of investors. The recent financial studies recognize the possibility of irrational behavior of investors affect to the stock price in the market. Black (1986) states that the irrational investors will trade stocks on their believed. The irrational investors tend to optimistic or pessimistic about the stock market, especially to IPOs. They believe incorrectly about the fundamental value of firm. If the market does not have the irrational investors, the market price of stocks will not move. Helwege and

Liang (2004) document that the IPOs, in hot issue market, with a higher initial return tend to have a lower long-run stock price performance than the IPOs in cold issue market. It means that the initial return of IPO is high once the IPO is listed and the stock price performance tends to decrease in the long-run. Then the stock return should be affected by the investors' behavior. Because the irrational investors trade on their believed which is incorrect believe about the firm's fundamental value. So the irrational investors' behavior seems to affect to the initial returns of IPO. Because of this reason, the high aftermarket demand of the investors also has a severely affected to the long-run stock price performance of IPOs. Ljungqvist, Nanda, and Singh (2006) state that there is the negative relation between the aftermarket demand and the long-run stock price performance. While Ritter (1984) claims that the issuers in the hot issue market (the period with high aftermarket demand of investors) is the high-risk issuers. We can imply that they may seek this opportunity, which the investors exuberant and willing to pay more for the stock higher than its intrinsic value, to issue the IPOs.

Many studies assume that the initial return reflects the issue discount by issuer, while the others assume that the initial return reflects the aftermarket demand of investors. So it cannot be concluded that the initial return reflects the issue discount by issuer or the aftermarket demand of investors. This is the unsettled debated. Our objective is to investigate whether initial return on average reflects the issue discount by issuers or the aftermarket demand of investors.

1.2 Statement of problem

Many studies assume that the initial return reflects the issue discount by issuer, while the others assume that the initial return reflects the aftermarket demand of investors. Then it cannot be concluded that which factor between the issue discount by issuers and the aftermarket demand of investors can represent the initial returns of IPO.

1.3 Objective of the study

Our objective is to investigate whether initial return on average reflects the issue discount by issuer or the aftermarket demand of investors. We try to make the conclusion about the factor which can represent the initial return of IPO.

1.4 Contribution

We find that our results are not consistent with the prior studies in U.S stock market. The initial return is not the signal of the post-issue operating performance and the long-run stock price performance. While some of the prior studies in the U.S stock market document that the initial return is the signal of the issuers' quality, and some of them suggest that the initial return is the signal of the long-run stock price performance.

1.5 Methodology and Result in Brief

There are two unsettled debated meanings of initial return between the issue discount by issuer and the aftermarket demand of investors. From the previous studies, both factors seem to have the relation with the post-issue operating performance and the long-run stock price performance.

We apply two methodologies to measure the post-issue operating performance. They are the industry adjusted performance (IAP) and the multivariate regression. The industry adjusted performance (IAP) is the changed in operating return on asset (ROA) adjusted with the median changed in operating return on asset of the industry. We follow this methodology from Jain and Kini (1994). The multivariate regression is the methodology to make the result confirmation with the measurement of the post-issue operating performance by the industry adjusted performance (IAP). This methodology represents the relation between the post-issue operating performance and the initial return.

We apply three methodologies to measure the long-run stock price performance. They are the event-time approach, the calendar-time approach, and the multivariate regression. We apply the market adjusted return and the Fama and French three factors model under the event-time approach, and the Fama and French three factors model under the calendar-time approach to measure the long-run stock price performance. The multivariate regression will represent the relation between the long-run stock price performance and the initial return. All methodologies are used to make a confirmation the result among them.

Our evidences are not consistent with our hypotheses. The initial return does not have the relation with the post-issue operating performance and the long-run stock price performance, and it is not the signal of the issuer's quality and the stock performance. Because the market underreaction does not exist in London Stock Exchange, and the operating performance may be the noisy proxy for the expected quality of the issuer. So our results are not consistent with the evidence of the prior studies in U.S stock market.

1.6 Organization of the Study

This thesis is organized as follow. Chapter II presents the literature review and the hypothesis. Chapter III describes the data and methodology used in this study. Chapter IV provides the empirical evidence. Finally, Chapter V presents the conclusion.

CHAPTER II

LITERATURE REVIEW AND HYPOTHESIS

2.1 Literature Review

As discuss earlier, in the previous studies, the meaning of initial returns of IPO is defined into two different meanings between issue discount by issuers and aftermarket demand. The different motivation and the signal sending of them will be discussed in this section.

2.1.1 Motivation of Issue Discount by Issuers

The issue discount is the action that issuers and/or their underwriters set the offer price of new issues lower than its intrinsic value. Several studies investigate about the motivation to discount the new issue and issuers' signal sending through the issue discount underlying on the asymmetry information. Allen and Faulhaber (1989), and Grinbatt and Hwang (1989), as the signaling hypothesis, document that the issuers use the issue discount in order to distinguish themselves from the low-quality issuers and receive more favorable market reaction for the season equity offerings (SEOs). Thus high level of issue discount is a signal of high firm's quality. When the firms decide to discount the new issues, their initial owners' wealth will reduce immediately. However their wealth will be recovered in the future because the information about the firm's quality will be disclosed in the long-run. For this reason, the high-quality issuers decide to signal firms' quality by discounting the new issues. On the other hand, if the low-quality firms discount the new issues, the initial owners'

lose cannot recover in the long-run. Since they know that they will not have a good performance in the future, that is no incentive to discount the new issues. However, Spiess and Pettway (1997) try to test the signaling hypothesis, and they disagree. They argue that the discount issuer does not recover their cost of issue with their post-issue operating performance, and a lot of issuers are quickly to issue the season equity offerings (SEOs) followed the IPOs. Because of this reason, the issuing firms may not recover their cost of issue discount by their operating performance, but they recover their cost of issue IPOs by issuing the SEOs. Moreover, they also find that the initial owners of discounted IPO sell their personal shares at the initial public offerings. If the signaling hypothesis is true, the initial owners of the discounting IPOs should not sell their personal shares but they should pick it up in order to get the profit in the future as they sending the signal. From this evidence, it can be implied that the issuers may discount the new issues in order to get a benefit from the season equity offerings (SEOs).

However several studies study the relation between the level of issue discount and the risk which the investors will face from the IPOs. Rock (1986) finds a positive relation between the level of risk and level of issue discount. Because the IPOs with overpriced, which an offer price is higher than the intrinsic value, are purchased by only uninformed investors. While the IPOs are discounted the offer price, both informed and uninformed investors will purchase them. It means that the 100 percent of overpriced IPOs are allocated to uninformed investors, while the IPOs with issue discounted are allocated to both informed and uninformed investors. The uninformed investors face the winner's curse. So the issuers discount the new issues in order to compensate the cost of becoming informed of investor. Ritter (1984) also finds the positive relation between level of risk and level of issue discount. He states that the

higher-risk issuers have a tendency of higher discounting the new issues and higher variability of the initial return than the lower-risk issuers, consistent with Rock (1986). Beatty and Ritter (1986) study about the relation between the level of issue discount and the ex ante uncertainty. After the IPOs are traded in the market, the aftermarket stock price may shoot up or decline. This uncertainty about the aftermarket price is called “ex ante uncertainty". The ex ante uncertainty is the risk that the investors will face. The IPOs with high level of ex ante uncertainty should have a high level of issue discount, while the IPO with low ex ante uncertainty also should have a low issue discount level. The issuers must hire the investment bankers, which are more expertise for issuing new stocks, to issue the IPOs in order to make a credible commitment for the issuers as the offering price is discounted at the optimal level for investors and issuers. Because the investors have a cost of analysis about the IPOs, so they will invest only the IPOs with discounted the offered price. The result of Beatty and Ritter (1986) is consistent with the result of Rock (1986), and Ritter (1984).

2.1.2 Motivation of Aftermarket Demand of Investors

Recently studies concern the sentiment investors or noise trading that affect to the stock price in the market especially to the initial public offerings (IPOs). Black (1986) documents that some investors in the market are noise traders. The noise traders will trade on the noise as if it is the information. If the market does not have the noise traders, the market price of stocks will not move. This is the evidence that the sentiment investors play the important role in the market. Rajan and Servaes (1997) document about the motivation of a high aftermarket demand. They state that the analysts tend to be the overoptimists about the earnings growth projection of IPO firms, consistent with Kothari, Sabino, and Zach (1999). Moreover Rajan and Servaes

(1997) also find that many investors appear to believe in the overoptimism of the analysts' projections.

2.1.2.1 *The Occurrence of Hot Issue Market*

The hot issue market usually has nearly mentioned with the aftermarket demand. Helwege and Liang (2004) study about the different characteristic of hot- and cold issue market. They find the evidence that the IPOs in hot issue market have higher initial returns, but lower stock price performance than IPOs in cold issue market. They document that the issuers in hot issue market tend to seek the "window of opportunity" to issue the IPOs when investors are more willing to purchase the IPOs. This result can be concluded that the hot issue market reflects the greater aftermarket demand. Loughran and Ritter (1995) also find the evidence that the public firms have a lower long-run stock price performance than the private firms. The investors must invest more money at 44 percent in the IPOs higher than invest in the private firms in order to receive the equally return. They documents that the public firms may take the opportunity to issue the IPOs when their stocks value are substantially overvalued, because of the high aftermarket demand. Lowry (2003) claims that the firms' demand and the sentiment investors play an important role for the decision to go public. Especially when the aftermarket demand is strong and the investors are willing to pay more for the new issue than its intrinsic value, many firms will see this opportunity and try to go public because of the lower cost of going public, consistent with Helwege and Liang (2004), and Loughran and Ritter (1995). These evidences represent that the strong aftermarket demand of investor has an important effect to the initial returns of IPOs and the decision to go public of company. Moreover, Ljungqvist, Nanda, and Singh (2006) assert that, in hot issue market, the strong aftermarket demand has a negative relation with the long-run stock

price performance because of the high aftermarket demand of the irrational investors at the early time of trading. When the aftermarket demand of irrational investor is acute in the early of listed, the initial return of IPO is also high. They also find that the decision to issue the IPOs in hot issue market is relative to both aftermarket demand and the offer price. They document that the issuers tend to set the offer price higher than the fundamental value in the hot issue market. If the strong aftermarket demand does not exist, the initial return of the IPOs, which offer price is higher than fundamental value, should be low or have a negative value. While the IPOs issued in the cold issue market have the offer price at the fundamental value, but the aftermarket demand is low in this period. The initial return of the IPOs in the cold issue market will be low. This evidence can be implied that the aftermarket demand affects to the initial return of IPO. It means that the IPOs, in the hot issue market, are overpriced after trading instead converged to its intrinsic value. In the long-run, when the aftermarket demand of the irrational investors reduces, because of more information disclosure, the long-run stock price performance will also decrease.

In summary, a lot of studies investigate the factors, between issue discount by issuer and aftermarket demand of investors, which can represent the initial returns of IPOs. It is the inconsistent conclusion among them. Some of studies assume that the initial return reflects the issue discount by issuer, while other studies assume that the initial return reflects the aftermarket demand of investor. This is the unsettled conclusion. We would like to investigate whether the initial return reflect the issue discount by issuer or the aftermarket demand of investors.

This thesis attempts to provide evidence for answering this unsettled debated. We investigate whether the initial return reflects the issue discount by issuer or the aftermarket demand of investors. Since the previous studies suggest that the initial

return has the relation with the post-issue operating performance and the long-run stock price performance, so we decide to investigate the relation of the initial return, in the different meanings between the issue discount by issuer and the aftermarket demand of investors, with the post-issue operating performance and the long-run stock price performance. These relations will help us to have the conclusion whether the initial return reflects the issue discount by issuer or the aftermarket demand of investors.

2.1.3 Study of Post-Issue Operating Performance

The operating performance is an indicator which can really represent both revenues and costs or expenses occurring in the business. So the operating performance is a reliable proxy for firm's quality. Several studies investigate for the relation between the post-issue operating performance and the initial return. Jain and Kini (1994) find that there is a significant decline in the post-issue operating performance of the IPO. They document that there is no relation between the post-issue operating performance and the initial return. However a lot of studies believe that the initial return of IPOs is the signal of their quality. Allen and Faulhaber (1989), and Grinbatt and Hwang (1989) find that there is a positive relation between the post-issue operating performance and the level of initial return, followed the signaling hypothesis. While Ritter (1984) disagree with the signaling hypothesis, he find that the post-issue operating performance has a negative relation with the initial return level.

2.1.4 Study of Long-Run Stock Price Performance

From the above discussion, the initial return of IPOs may contain the signal about the long-run stock price performance and substantial studies investigate for the relation between the initial return and the long-run stock price performance. Helwege and Liang (2004) document that the IPOs, in hot issue market, with higher initial return tend to have lower long-run stock price performance than the IPOs in cold issue market. This can be implied that the initial return of IPO has a negative relation with the long-run stock price performance. Ljungqvist, Nanda, and Singh (2006) suggest that aftermarket demand has a negative relation with the long-run stock price performance, and the aftermarket demand seems to effect to the initial return. So the initial return seems to have a negative relation with the long-run stock price performance, consistent with Helwege and Liang (2004).

However, several studies document that the long-run stock price performance is attributed underreaction to the signal, both positive and negative, sending to the market by company. The underreaction is the phenomenon that the investors slowly react to the news or signal announcement, because the information is slowly incorporated to the stock price. After the information is incorporated to the stock price, the intensive of the difference between fully react and underreact by investors will be decreased in the following period. Substantial studies investigate about the evidence of the long-run stock return under the events or information of the company sending to the market. Poterba, and Summers (1988) find a positive correlation of the index return between one month period and one year period. Bernard (1992) documents that the announcement of stock with earning surprise have a large drift of stock return in the following period after earning announcement, consistent with Chan, Jegadeesh, and Lakonishok (1996) . Kadiyala and Rau (2004) investigate for

the long-run stock abnormal return to the four corporate events as seasoned equity offerings, stock-financed acquisitions, share repurchases, and cash financed acquisitions. They find that the firms, which announce the good news, have a higher long-run stock price performance than firms which announce the bad news. Ritter (2003) also finds that the investors underreact to U.S SEOs, convertible bonds, bonds, open-market share repurchases, cash-financed acquisitions, and stock-financed acquisitions. The above evidences support the underreaction of investor for both positive and negative news. However the study of Fama and French (1996) suggests that the Fama and French three factor model cannot explain the anomaly of the momentum strategy, which has causation from the underreaction of the investors to the information in the market. Because of this reason, we assume that the reaction of the investor in the market is *underreaction* to the news or signal of the company, which this thesis is the signal from IPOs issuing.

2.2 Development of Hypothesis

Because the previous studies assume the different factors which can represent the initial return, they are the issue discount by issuer and the aftermarket demand of investors. This is the unsettled conclusion. Our thesis objective is trying to investigate whether the initial return reflects the issue discount by issuer or the aftermarket demand of investors. There are three main hypotheses that we want to test. The first and second hypothesis is the hypothesis that is useful to answer the thesis question. The third hypothesis is a further test to get more evidence.

In the first hypothesis, we would like to investigate whether the initial return reflects the issue discount by issuer. So the signal sending about the firm's quality by

issuing the discounted IPOs will be discussed. The relation of the initial return with the post-issue operating performance and long-run stock price performance will be investigated. From Beatty and Ritter (1986), they document that there is the monotonic relation between the issue discount by issuer and the ex ante uncertainty about its value. After the IPO is traded in the secondary market, the price of IPO maybe shoot up or decline. This uncertainty of the aftermarket price is called "ex ante uncertainty" about its value. The company must hire the underwriter, who is expertise, in order to enforce the discount equilibrium of IPO. Because the investors have a cost of analysis about the IPO, they will invest only in the IPO with discount in order to keep a return to compensate this cost. We believe that the aftermarket stock price of high-quality issuer should have a lower ex ante uncertainty level, because in the long-run the information of firm's quality will be disclosed to the market. So it has no incentive to discount the new issue at a high level. On the other hand, after the IPO of low-quality issuer is traded in secondary market, the information about the firm's quality is revealed in the market. When the investors perceive this information, the market price will be decreased with high level in the long-run. This can implied that the low-quality firm has high ex ante uncertainty level, so it should discount the IPO at a high level.

The study of Beatty and Ritter (1986) can be implied that the initial return level has a negative relation with the firm's quality. When the issuer decides to issue the IPO, the investors will try to analyze the optimal price of stock. Because the investors are more informed than the issuer consistent with Rock (1986), so they will wait to compare the optimal price with the offer price. Once the offer price is announced, the signal of the issuer is revealed to the market. Since the initial return comes from the difference between the first-day closing price and the offer price, and

the offer price level relies on the issue discount level. The higher level of issue discount is the lower offer price, while the lower level of issue discount is the higher offer price. If we assume that the first-day closing price is the optimal price of IPOs, the lower offer price (higher level of issue discount) leads to higher initial return. Similarly, the higher offer price (lower level of issue discount) leads to the lower initial return. So the high initial return (high issue discount level) is a negative signal of the issuer, while a low initial return (low issue discount level) is a positive signal of the issuer. To the extent that investors underreact[1] to the signal of issuers, the stock with a negative signal (high initial return or high issue discount level) will have a lower stock price performance in the long-run. Conversely, the stock with positive signal (low initial return or low issue discount level) will have a tendency of higher positive stock price performance in the long-run. Then we expect that there is the negative relation between the initial returns and the post-issue firms' operating performance and the long-run stock price performance.

Hypothesis 1: Issue Discount Hypothesis

***Hypothesis 1.1*: For IPOs with *high* initial returns, the post-issue firms' operating performance will be relatively *low*. Similarly, for IPOs with *low* initial returns, post-issue firms' operating performance will be relatively *high*.**

***Hypothesis 1.2*: For IPOs with *high* initial returns, the long-run stock price performance will be relatively *low*. Similarly, for IPOs with *low* initial returns, the long-run stock price performance will be relatively *high*.**

[1] The extent degree of the underreaction is very proportionate with the absolute magnitude/intensity of the new information. The reason is that the underreaction has a limited ability to react to the new information.

In the second hypothesis, we would like to investigate whether the initial return reflects the aftermarket demand of investors. From the previous studies, the aftermarket demand of investors for IPO should be the signal about the issuer's quality and stock price performance. So it is necessary to investigate firm's quality through the post-issue operating performance and long-run stock price performance. The relation of the initial return, from the aftermarket demand, with the post-issue firm's operating performance and long-run stock price performance of the new issue is investigated. From Ljungqvist, Nanda, and Singh (2006), the issuer sets the offer price higher than the fundamental value in the hot issue market, while the issuer sets the offer price equal to the fundamental value in the cold issue market. Because we do not recognize about the period of issue, so we would like to assume that the issuer sets the offer price of IPOs equal to the fundamental value. When the issuer decides to issue IPO, the offer price is announced. The size of initial return will only depend on the aftermarket demand of investors. Since the investors are more informed than the issuer, they will know about the firms' quality. Because of this reason, the investors will react to the stock in the correct direction of issuer's quality. It can be implied that the issuer's stock with high aftermarket demand should be a high-quality issuer, and issuer's stock with low aftermarket demand should be a low-quality issuer. However the investors remain to underreact to this information. The IPO with high initial return[2] (high aftermarket demand) should have a higher stock price performance in the long-run, while the issuer's stock with low initial return (low aftermarket demand) should have a lower stock price performance in the long-run.

[2] The really initial return of the high quality issuers should be higher from this level, if the investors are fully react to the signal.

Hypothesis 2: Aftermarket Demand Hypothesis

Hypothesis 2.1: **For IPOs with *high* initial returns, the post-issue firms' operating performance will be relatively *high*. Similarly, for IPOs with *low* initial returns, the post-issue firms' operating performance will be relatively *low*.**

Hypothesis 2.2: **For IPOs with *high* initial returns, the long-run stock price performance will be relatively *high*. Similarly, for IPOs with *low* initial returns, the long-run stock price performance will be relatively *low*.**

In the third hypothesis, we divide our samples according to the amount of disclosure information. We apply the disclosure of the used of IPO proceed in the prospectus as the proxy of the amount of disclosure information about the issuers. This proxy is about the objective, which the issuer discloses, of the fund raising. We separately consider this objective into two groups: (i) a specific used of the IPO proceed, such as for acquisition; and (ii) general corporate purposes. Leone et.al (2007) document that the specific used of IPO proceed is associated with the lower IPO underpricing level. They suggest that the IPOs with specific used of proceed have less ex ante uncertainty and the disclosure as specific used of proceed will help investors to estimate the dispersion of the stocks' value in the secondary market. The result of Leone et al. (2007) seems to be consistent with Beatty and Ritter (1986). Beatty and Ritter (1986) document that there is the positive relation between the level of issue discount and the ex ante uncertainty. So the IPO with the specific used of IPO proceed, which has lower ex ante uncertainty, should be discounted the offer price at the low level. It leads to low initial return of IPO. Moreover, Myers and Majluf (1984) state that the issuer decides to announce the specific corporate purpose in order to

reduce the information symmetry problem. So it can be reduced the cost of issuing the new issued. It can be implied that the IPO with specific used of proceed is not discounted at the higher level. Then, from the above studies, it can be concluded that the IPO with specific used of proceed has a lower issue discount than the IPO with general corporate purpose. So the IPO with specific used of IPO proceed should have a lower initial return than IPO with general corporate purpose. It may be the case that the issuer may lie about the objective of IPO issuing. However the investors can verify the company. If the company still lies, they may be sued. So the company will not lie about the objective of the issuing IPO.

From the above discussion, the IPO with specific used of proceed seems to have the lower ex ante uncertainty. So it should be the stock of high-quality issuer. Because the investors are more informed than the issuer, they will react with the correct direction. Then the IPO specific used of IPO proceed should have the higher initial return than the IPO with general corporate purpose.

Hypothesis 3: Used of IPO Proceed Hypothesis

***Hypothesis 3.1*: If the *issue discount* represents the initial return, the stock with specific used of IPO proceed purpose should have a *lower* initial return than the stock with general corporate purpose.**

***Hypothesis 3.2*: If the *aftermarket demand* represents the initial return, the stock with specific used of IPO proceed purpose should have a *higher* initial return than the stock with general corporate purpose.**

CHAPTER III

DATA AND METHODOLOGY

3.1 Data

We construct our sample of IPOs in the London Stock Exchange (LSE). Our samples are listed during January 1991 to December 2005. All IPOs of our samples are 1,844 companies. We investigate only the production companies, so we exclude the investment trusts, financial companies, building societies, privatization issues, foreign-incorporate companies, unit offering, and spin-off. After we exclude 442 IPOs samples, which are not the IPOs of the production companies, the residual samples are 1,402 companies.

Data of samples come from two sources. Details of IPOs, which are offer price, amount of shares issued, detail of the used of IPO proceed purpose, and industry code level four (INDC4) are available on Securities Data Company (SDC). The yearly accounting data (EBITDA, sales, and total assets), daily and monthly total return index, and unadjusted price of IPOs are reported in Datastream. We interest three years of the post-issue operating performance and the long-run stock-price performance, after IPOs are listed. Because the accounting data is required as yearly data, the first account data is perceived as accounting data at year 0. So we must collect the accounting data for four year, after listed, in order to measure the three-years operating performance. After we collect all data, 493 companies have an unavailable data of accounting data, and daily and monthly total return index from Datastream. So we truncate them. The final residual samples are 901 companies. We

assume the return of the samples, which delist before three years after listed, equally to zero after they delist. For the defining the used of IPO proceed purpose, the samples with the used of IPO proceed purpose as general corporate purpose, and secondary purpose are recognized as the general corporate purpose, while the others (such as future acquisitions, marketing and sales, project finance, and refinancing) are accepted as a specific used of IPO proceed purpose.

3.2 Methodology

Because the thesis purpose is to investigate whether the initial return reflects the issue discount by issuer or the aftermarket demand of investors, and, from the previous studies, both factors seem to have the relation with the post-issue operating performance and the long-run stock price performance. So the post-issue operating performance and the long-run stock price performance measurement are applied. We investigate the post-issue operating performance and long-run stock price performance along three years after the IPOs are listed. The initial return, the post-issue operating performance, and the long-run stock price performance are grouped with our interest variables in order to test our hypotheses. The interested variables are the initial return and the used of IPO proceed. We divide the initial return with quintile as Q1, Q2, Q3, Q4, and Q5. The initial return in Q1 is defined as the highest initial return group, while the initial return in Q5 is defined as the lowest initial return group. Dividing initial return along quintile is appropriate for our hypotheses testing, because the data will be apparently divided into the highest and the lowest initial returns group. For the amount of disclosure information of the issuers in the market, the used of IPO proceed is applied as the proxy. The used of IPO proceed is divided

into two groups: (i) a specific used of IPO proceed, and (ii) general corporate purpose. In this section we will represent into main four parts: initial return measurement, post-issue operating performance measurement, long-run stock price performance measurement, and multivariate regressions.

3.2.1 Initial Return Measurement

The initial return is defined as first-day initial return. The first-day closing price and the offer price of IPOs play the important role to initial return measurement. We assume that there is a short-sell constraint. The initial return is calculated from the difference between first-day closing price (used the unadjusted price in Datastream) and offer price divided offer price. After we calculate the initial return with the first-day closing price, more than a half of samples show the incidence of zero initial return[3]. Because the unadjusted price from Datastream shows the first-day closing price as the offer price, so we decide to use the third-day closing price to measure the initial return instead. The initial return measurement is shown in equation *(1).*

$$IR_i = (P_{i,3} - F_i)/F_i \qquad (1)$$

where, IR_i is the initial return of IPO i . $P_{i,3}$ is the closed price on the third-day trading of IPO *i*. F_i is the offered price of IPO *i.*

3.2.2 Post-Issue Operating Performance Measurement

Because the operating performance is the indicator to represent the revenue and costs of the business, so it is the reliable proxy of the firms' quality. We follow the operating return on assets (ROA) as the operating performance measurement from Jain and Kini (1994), because this ratio provides a measurement of the asset

[3] I would like to thanks Prof. Tim Jenkinson, Said Business School at University of Oxford, for the advised of data for measuring initial returns.

utilization efficiency. The operating return on assets (ROA) is calculated by the operating income (before depreciation and taxes) divided total asset, as in equation *(2)*.

$$Operating\ Return\ on\ Assets_{it} = \frac{Operating\ \ income\ \ (before\ \ depreciation\ \ and\ \ taxes_{it})}{Total\ \ assets_{it}} \quad (2)$$

Barber and Lyon (1996) suggest that the *changed* of firms' operating performance adjusted with the appropriate benchmark has a more powerful of statistical test than measuring the operating performance with the level of firm's operating performance adjusted with appropriate benchmark. Moreover, the changed of the operating return on asset (ROA) also will make a clear picture of the improvement of firms' operating performance. However, it is important to compare the firms' operating performance with the appropriate benchmark. Barber and Lyon (1996) suggest that the changed of firm's operating performance adjusted with industry benchmark are well specified and powerful. We apply the median changed in operating return on assets of industry as the benchmark of the operating performance measurement. Because the measurement of operating performance may have a skewness problem, and mean of them is sensitivity with the outlier. So we decide to apply the median changed in operating performance of industry as the benchmark, we call the changed of ROA adjusted with the median changed of industry ROA as the industry adjusted performance (IAP) . We measure the industry-adjusted performance by matching each sample with firms in the same industry based on the INDC4 from Securities Data Company (SDC). The changed of firms' operating performance adjusted with median changed in ROA of industry is measured in equation *(3)*.

$$Industry\ adjusted\ performance\ (IAP)_{it} =$$

$$Changed\ in\ ROA_{it} - Median\ changed\ in\ ROA\ of\ all\ firms\ in\ industry_{it} \quad (3)$$

We report median of firms' operating performance for three years after the IPOs are listed. Because our samples may have the outliers, the median will be more appropriate to measure the central value than mean. The two-tailed Wilcoxon signed ranks is used to test the statistical significance of median. To test the difference of median between the highest initial return group (Q1) and lowest initial return group (Q5), we apply Mann-Whitney test to test the difference between them.

3.2.3 Long-Run Stock Price Performance Measurement

3.2.3.1 Return of Stock

We investigate for three years or 36 months after the IPOs are listed. The monthly stock return is interested. It is calculated by the difference between the closing price at month *t* and closing price at month *t-1*, divided closing price at month *t-1* as in equation *(4)*.

$$R_{it} = (P_{it} - P_{i,t-1})/P_{i.t-1} \qquad (4)$$

where, R_{it} is the return of stock *i* at time *t*. P_{it} is the closing price of stock *i* at time *t* (ending of period). $P_{i,t-1}$ is the closing price of stock *i* at time *t-1* (beginning of period).

3.2.3.2 Long-Run Abnormal Return Measurement

To measure the long-run stock price performance, we apply both an event-time approach and a calendar-time approach to examine the long-run stock price performance of our samples through three years or 36 months. Because each approach has both advantage and disadvantage, we apply both approaches in order to make a confirmation the results between them.

3.2.3.2.1 Event-Time Approach

The advantage of the event-time approach is that it yields an abnormal return measure closely to the investor experience. Under this approach, we apply two methodologies to measure the long-run stock price performance. They are the market adjusted returns and the Fama and French three-factors model.

3.2.3.2.1.1 Market Adjusted Return

We follow this methodology from Ritter (1991). This methodology applies the market return as the benchmark to measure the stock abnormal return. We apply London Stock Exchange index as the benchmark. Market adjusted return is calculated as the monthly return on a stock minus the monthly market return. The market adjusted return for stock *i* in month *t* defined as:

$$AR_{it} = R_{it} - R_{mt} \qquad (5)$$

where, AR_{it} is the monthly abnormal return of stock *i* at time *t*. R_{it} is the monthly return of stock *i* at time *t*. R_{mt} is the monthly return of market at time *t*.

Under this approach we do not account the time framework as the calendar month. For example, the IPO is issued on June 12th, we account the first monthly return of this IPO from June 13th to July 13th. The second monthly return of this IPO is from July 13th to August 13th, and so on. After we get the time series of monthly abnormal return of each stock, we need to calculate the abnormal return for the horizon 12, 24, and 36 months of them.

Generally the previous studies apply two approaches for measurement the long-run abnormal returns. They are the cumulative abnormal returns (*CARs*) and the buy-and-hold abnormal returns (*BHARs*). The *CARs* is the arithmetic average of the

time-series of abnormal returns, while the *BHARs* is the compounding of the time-series of abnormal returns. Fama (1996) states that the *BHARs* is the better approximation for the short horizons, like a month, than for longer horizons. Because the *BHARs* come from the compounding the abnormal return, so the *BHARs* for long horizon is leading to the severe skewness problem. Fama (1998) suggests that the *CARs* will have a fewer statistical problem than the long-term *BHARs* because of the lower skewness problem. So we decide to apply the cumulative abnormal returns (*CARs*) as the estimator to measure the long-run abnormal return as the following:

$$CAR_{iT} = \sum_{t=1}^{T} AR_{it} \qquad (6)$$

where, CAR_{iT} is the cumulative abnormal return of stock *i* for period *T*. AR_{it} is the abnormal return of stock *i* at time *t* (calculated in equation *(5)*). T is the interested horizon (12, 24, 36 months).

The equally weighted average (EW) is applied to measure the average of cumulative abnormal returns for each group of interested variable (initial return, and the use of IPO proceed). We decide to use the equally-weighted average (EW) instead the value-weighted average (VW) because our hypotheses interest on the direction of the long-run stock price performance. We do not interest about the amount of wealth of the portfolio in the long-run. So we give the important both large stock and small stock equally. The EW abnormal return of each group at the interested horizon comes from:

$$\overline{CAR}_{pT} = \frac{\sum_{i=1}^{N} CAR_{iT}}{N} \qquad (7)$$

where, $\overline{CAR}_{pT}$ is the equally-weighted average cumulative abnormal return of each group or portfolio at each interested horizons. CAR_{iT} is the cumulative abnormal

return of stock i at each interested horizons (calculated in equation *(6)*). *N* is the amount of stock in each group or portfolio. *T* is the interested horizons (12, 24, 36 months).

We report both mean and median of $\overline{CAR}_{pT}$ of each portfolio/ or group of interest. The *t-statistic* is applied to test the statistical significance of mean of $\overline{CAR}_{pT}$, and Wilcoxon signed ranks test is applied to test the statistical significance of median. We use the *t-statistical* and Mann-Whitney test to test the difference of mean and median of $\overline{CAR}_{pT}$ between group of Q1 and Q5, respectively.

3.2.3.2.1.2 The Fama-French Three-Factor Model

We apply this approach followed Barber and Lyon (1997). We need to estimate the stock price performance on the post-issue window 36 months following the month of issued. We apply time framework as the calendar month. We call the month, which the IPO is issued, as the event month. We account the event month as time zero (*t*=0). We account the month following the event month is *t*=1 and we use the monthly return from time *t*=1 to *t*=36. After we get the time-series monthly returns of each IPO in our sample, we regress it in the Fama and French three-factor model.

As shown below, the dependent variable of the regression is the monthly excess returns of IPOs ($R_{it} - R_{ft}$). R_{ft} is measured by the monthly return of three month treasury bills, while the explanatory variables are a market factor, a size factor (SMB), and a book-to-market factor (HML). We calculate the SMB and HML according to Fama and French (1993)[4].

$$R_{it} - R_{ft} = \alpha_{iT} + \beta_{iT}\left(R_{mt} - R_{ft}\right) + s_{iT}SMB_t + h_{iT}HML_t + \varepsilon_{iT} \qquad (8)$$

[4] See in Appendix

where, $R_{it} - R_{ft}$ is the monthly excess stock return of stock *i* at time *t*. $R_{mt} - R_{ft}$ is the monthly market excess return at time *t*. SMB_t is the difference in return between the small capital stocks and the large capital stocks at time *t*. HML_t is the difference in return between the high book-to-market stocks and the low book-to-market stocks at time *t*. ε_{iT} is the residual term.

The regression yield parameters estimate of α_{iT}, β_{iT}, s_{iT}, and h_{iT} in the period of 12, 24, and 36 months. Our interested parameter in this regression is the intercept term (α_{iT}). This parameter will represent the long-run abnormal return of each IPO in the interested periods. A positive intercept indicates that after controlling for market, size, and book-to-market factors in returns, an IPO has performance better than the expected.

The equally weighted average (EW) is applied for average the abnormal, as in equation *(9)*. We report both mean and median of abnormal return (α_{pT}) for each portfolio/ or group of interest. The *t-statistic* is used for testing the statistical significance of mean, and Wilcoxon signed ranks test is used for testing the statistical of median. We test the difference of mean and median of abnormal return (α_{pT}) between Q1 and Q5 by *t-statistic* and Mann-Whitney test respectively.

$$\bar{\alpha}_{pT} = \frac{\sum_{i=1}^{N} \alpha_{iT}}{N} \qquad (9)$$

where, $\bar{\alpha}_{pT}$ is the equally-weighted average of abnormal return in each portfolio/ or group of interest at the interested horizon (12, 24, and 36 months). α_{iT} is the abnormal return of stock *i* at the interested horizon, getting from equation *(8)*. *N* is the amount of stock in each portfolio/ or group of interest.

However the event-time approach also has a disadvantage. Lyon, Barber and Tsai (1999) state that the event-time approach has a more sensitivity to the problem of cross-sectional dependence among sample firms. From the previous studies as in our literature review parts, IPOs seem to have a pattern of long-run stock price performance. For example, the IPOs with high initial return have a downward direction of long-run stock price performance. We can imply that all IPOs stocks should have the correlation about the long-run stock price performance among them. However we assume that there is no cross-sectional dependence between our samples to test *t*-statistic. As a result the standard deviation of the portfolio will be small, because the covariance among the sample is equal to zero. So the *t-statistic* will be inflated. This problem is leading to severe over-rejection of null hypothesis.

3.2.3.2.2 Calendar-Time Approach

We apply this approach followed Mitchell and Stafford (2000). Lyon, Barber and Tsai (1999) claim that the advantage of this approach is that it eliminate the problem of cross-sectional dependence among sample firms. Because of the disadvantage of the event-time approach we must apply the calendar-time approach to confirm the result of the event-time approach. Under this approach, we form the portfolio of IPOs that participated in the event within 36 months. The event month is defined as time zero (t=0). The following month is defined as t=1. Portfolios are rebalanced monthly to drop all companies that reach the end of their 36 months periods and add all companies that have just executed transaction. After we get the time-series of monthly return of IPOs portfolio of each interested group, we apply it as R_{pt} in the below equation and regress it in the Fama and French three-factor model.

The intercept (α_{pT}) measures the average monthly abnormal return on the portfolio of event firms.

$$R_{pt} - R_{ft} = \alpha_{pT} + \beta_{pT}(R_{mt} - R_{ft}) + s_{pT}SMB_t + h_{pT}HML_t + \varepsilon_{pT} \qquad (10)$$

where, $R_{pt} - R_{ft}$ is the monthly excess stock return of portfolio at time *t*. $R_{mt} - R_{ft}$ is the monthly market excess return at time *t*. SMB_t is the difference in return between the small capital stocks and the large capital stocks at time *t*. HML_t is the difference in return between the high book-to-market stocks and the low book-to-market stocks at time *t*. ε_{iT} is the residual term.

The regression yield parameters estimate of α_{pT}, β_{pT}, s_{pT}, and h_{pT} in the period of 12, 24, and 36 months. Our interested parameter in this regression is the intercept term (α_{pT}). The α_{pT} will represent the abnormal return of each portfolio/ or group of interest in the interested time of periods. A positive intercept indicates that after controlling for market, size, and book-to-market factors in returns, the IPOs in the group have performance better than the expected.

We cannot tell whether the intercept (α_{pT}) between group Q1 and Q5 are equal. So we add dummy variable for Q1 and Q5 group, and their interaction term[5] in order to test the difference of them. The observations in Q1 and Q5 group are pooling to the one observation and run the regression again by giving the market excess return $(R_{mt} - R_{ft})$, *SMB*, and *HML* be the interaction terms as shown below:

$$R_{pt} - R_{ft} = \gamma_{0T} + +\gamma_{1t}(R_{mt} - R_{ft}) + \gamma_{2T}SMB_t + \gamma_{3T}HML_t + \gamma_{4T}D_1 +$$
$$\gamma_{5T}D_1(R_{mt} - R_{ft}) + \gamma_{6T}D_1SMB_t + +\gamma_{7T}D_{1T}HML_t + +u_T \qquad (11)$$

[5] See in Handbook of Gujarati (2003)

where, $R_{pt} - R_{ft}$ is the monthly excess stock return of portfolio at time *t*. $R_{mt} - R_{ft}$ is the monthly market excess return at time *t*. SMB_t is the difference in return between the small capital stocks and the large capital stocks at time *t*. HML_t is the difference in return between the high book-to-market stocks and the low book-to-market stocks at time *t*. *D* is a dummy variable, equal to 1 for the observation in Q1 group, and 0 for otherwise (Q5 group). u_T is the residual term.

The regression yield parameters estimate of γ_{0T}, γ_{1T}, γ_{2T}, γ_{3T}, γ_{4T}, γ_{5T}, γ_{6T}, and γ_{7T} in the period of 12, 24, and 36 months. Our interested parameter in this regression is coefficient of D_1 (γ_{4T}). If the γ_{4T} is significance, the intercept (α_{pT}) between Q1 and Q5 are different. The positive γ_{4T} means that the intercept in Q1 group is higher than intercept in Q5 group. The negative $\gamma_{4T}$is otherwise.

However the calendar-time approach also has the disadvantage. The disadvantage of this approach is that it yields an abnormal return measure that does not precisely measure investor experience, while the event-time approach does not have this problem. Because the two approaches (event-time and calendar-time approach) have both advantage and disadvantage, the advantage and disadvantage of them are offset together. This is the reason that we decide to use both event-time, and calendar-time approach to measure the long-run stock price performance.

3.2.4 Multivariate Regressions

The multivariate regression is used for re-approved the result from the above post-issue operating performance measurement and the long-run stock price performance measurement. We apply the multivariate regression to find the relation

between the post-issue operating performance and initial return in the first multivariate regression and to find the relation between the long-run stock price performance and initial return in the second multivariate regression. Our control variables in both multivariate regressions are firms' size and firms' growth. Although we already measure the abnormal return with Fama and French three-factor model which capture the abnormal return with market risk premium, size, and book-to-market, but Fama and French (1993) find that the size effect remain exists in the small size with high book-to-market stock. Moreover, Wisner (1993) documents about the economies of scale, indicates to size, relate to the long-term benefit productivity. High level of economies of scale will make a cost per unit reduction. This will effect to the profit of the firms. If the firms can reduce the cost of production, the firms will get a higher profit level, which should have a high growth opportunity. This can be implied that the firms with a larger size (high economies of scale) will have a higher profit, and higher growth rate than smaller size firms. It means that the firms' size should relate with the firms' profit, and firms' growth. Because the firms' size relate with the firms' profit, firms' growth (Wisner (1993)), and the size-effect remain exists (Fama and French (1993)), so we decide to include firms' size and firms' growth to be the control variables for both multivariate regressions. The total asset at year 0 (listed year) is used as the proxy of firms' size, and the sale growth is used as the proxy of firms' growth. For the sale growth, we divide it into quartile, and we replace its value with dummy for each quarter.

3.2.4.1 Multivariate regression 1

The first multivariate regression represents the relation among the firm's operating performance (*PERF*), initial returns of IPOs (*INITIAL*), and the vector of control variables.

$$IAP_{it} = a_{0t} + a_{1t}INITIAL_i + \sum_{t=1}^{T} a_{2t}X_{it} + \varepsilon_t \quad (12)$$

where, $PERF_{it}$ is the average industry adjusted performance of the stock *i* at time *t*. $INITIAL_{it}$ is the first-day initial returns of stock *i*. X_{it} is a vector of control variables of stock *i* at time *t*. ε_t is the regression residual term.

The regression yield parameters estimate of a_{0t}, a_{1t},, and a_{2t} in the period of 12, 24, and 36 months. Our interested parameter in this regression is coefficient of $INITIAL_t$ (a_{1t}). We want to capture the direction of it. If the a_{1t} is positive, the operating performance seem to have a positive related with initial return level. The IPOs with high initial return should have the high post-issue operating performance, after the IPOs are listed. Oppositely, if the a_{1t} is negative, the post-issue operating performance seems to have a negative relation with the initial return level. The IPOs with high initial return should have a low post-issue operating performance.

3.2.4.2 Multivariate regression 2

This multivariate regression represents the relation of the abnormal return *(AR)* and the first-day initial returns of IPOs *(INITIAL)*.

$$AR_{it} = b_{0t} + +b_{1t}INITIAL_i + \sum_{t=1}^{T} b_{2t}X_{it} + \varepsilon_t \quad (13)$$

where, AR_{it} is the abnormal stock returns from the event-time approach under Fama and French three factor model (intercept in equation *(8)*) during 3 years. $INITIAL_i$ is the initial returns of stock *i*. X_{it} is a vector of control variables of stock *i* at time *t*. ε_t is the regression residual term.

The regression yield parameters estimate of b_{oT}, b_{1t},, and b_{2t} in the period of 12, 24, and 36 months. Our interested parameter in this regression is coefficient of

$INITIAL_t$ (b_{1t}). We want to capture the direction of it. If the b_{1t} has a positive direction, the long-run stock price performance seem to have a positive related with initial return level. The IPOs with high initial return should have the high long-run stock price operating performance, after the IPOs are listed. Oppositely, if the b_{1t} is negative, the long-run stock price performance seems to have a negative relation with the initial return level. The IPOs with high initial return should have a low long-run stock price performance.

For the sample divided according to the used of IPO proceed purpose, we have to investigate the difference of the initial return between the group of specific used of IPO proceed and general corporate purpose. Because we cannot tell whether the coefficient of *INITIAL* term between the groups of specific used of proceed and general corporate purpose are equal. So we add dummy variable for the group of specific used of proceed and general corporate purpose and their interaction term with the *INITIAL* term. The observation in specific used of proceed and general corporate purpose are pooling to the one observation and run the regression again. The equation is shown below:

$$AR_{it} = c_{0t} + c_{1t}INITIAL_i + c_{2t}D_1 + c_{3t}D_1INITIAL_i + \varepsilon_t \qquad (14)$$

where, AR_{it} is the abnormal stock returns from the event-time approach under Fama and French three factor model (intercept in equation *(8)*) during 3 years. $INITIAL_i$ is the initial returns of stock *i*. *D* is a dummy variable, equal to 1 for the observation in specific used of proceed group, and 0 for otherwise (general corporate group). ε_t is the regression residual term.

The regression yield parameters estimate of c_{0t}, c_{1t}, c_{2t}, and c_{3t}, in the period of 12, 24, and 36 months. Our interested parameter in this regression is coefficient of

$D_1 INITIAL$ (c_{3t}). If the c_{3t} has statistical significance, the coefficient of *INITIAL* (b_{1T}) between specific used of proceed group and general corporate group are different. The positive c_{3t} means that the coefficient of *INITIAL* of specific used of proceed group is higher than general corporate purpose group. The negative c_{3t} is otherwise.

CHAPTER IV

EMPIRICAL EVIDENCE

Our results of study are represented in this chapter. It is divided into two sections. Section 4.1 presents the results of the post-issue operating performance and the long-run stock price performance and compare them with our hypotheses. Section 4.2 presents the discussion between our results with the prior study in U.S stock market.

4.1 Results

4.1.1 Initial Return

The descriptive about number of issues, total gross proceed, initial return, and the money left on the table during period 1991 to 2005 are reported in Table I. The median of initial return seems to be the proper central value of initial returns than the mean of initial return, because our samples may have the outliers. The median of initial return of our sample in 1991-2005 periods is 9.50%. If we divide the median of initial return with quintile in order to define the periods of high initial return, the periods with high initial returns are year 1991, 1993, and 1999. The periods with high initial return, especially in year 1993 and 1999, will lead a large amount of issuers in the following periods. Our result is consistent with Ritter (1984). He states that the periods with high volume of issuers tend to follow the periods with high average initial returns. Moreover, we find that the periods with high volume of issuers and high total gross proceed, such as in year 1994, 1996, 2000, 2004, 2005 also have the high level of the money left on the table.

4.1.2 Relation between Initial Returns and Post-Issue Operating Performance

We apply two methodologies to study about the post-issue operating performance. There are the industry adjusted performance measurement (*IAP*) and the multivariate regression. The result industry adjusted performance measurement (*IAP*) is reported in Table II and Table III. The result of multivariate regression is reported in Table IV.

The result in Table II shows the post-issue operating performance of IPO in year 0 to 3 periods. The IPOs with high initial return (Q1 group) have the *IAP* at 11.16% with statistical insignificance, and the IPOs with low initial return (Q5 group) have the *IAP* at 7.32% with statistical insignificance. So the IPOs in Q1 have a higher *IAP* than the IPOs in Q5 group in year 0 to year 3 periods. The difference of the *IAP* between Q1 and Q5 is 3.85% with statistical insignificance. The post-issue operating performance in year 1, 2, and 3 periods is represented in Table III in order to see the improvement of IPOs' post-issue operating performance in each period. The IPOs in Q1 have the lower *IAP* than IPOs in Q5 along year1, 2, and 3. The difference of the *IAP* between Q1 and Q5 is -4.19%, -16.68%, and -9.27% with statistical insignificance in year 1, 2, and 3 respectively. Although the *IAP* of Q1 in year 0 to 3 period is higher than the *IAP* in Q5, but the *IAP* of Q1 is lower than the *IAP* in Q5 every period (year1, 2, and 3). Because the *IAP* in year 0 to 3 period comes from the geometric mean of period year 1, 2, and 3, this may be become the reason of higher post-issue operating performance of IPOs in Q1 group in year 0 to 3 period. However our results under this methodology, in Table II, and Table III, suggest that the initial return does not have the relation with the post-issue operating performance.

We apply the multivariate regression to make a confirmation about the results from the industry adjusted performance measurement (*IAP*). The result of multivariate regression is represented in Table IV. The results suggest that the post-issue operating performance in year 0 to 3 of Q1 has a positive relation with the initial returns at 10% statistical significance, but the post-issue operating performance in other periods (year1, 2, and 3) do not have the relation with the initial return. While the post-issue operating performance of Q5 has a negative relation with the initial return at 10% statistical significance in year 0 to 3 period, but the post-issue operating performance in year 2, and 3 do not have the relation with the initial returns. The post-issue operating performance in year 1 has a negative relation with the initial returns at 1% statistical significance. The results suggest that the post-issue operating performance does not have the relation with the initial return of IPO, but the post-issue operating performance seems to have the relation with the sale growth (proxy of firm's growth) and total asset (proxy of firm's size) instead. The IPO in the lowest sale growth group seems to have a better post-issue operating performance than the IPO in the other groups of sale growth, and the post-issue operating performance has a negative relation with the total asset.

Concludely, our results suggest that the initial return is not the signal of the post-issue operating performance of IPOs. Because the post-issue operating performance divided with the initial return has the statistical insignificance, so the post-issue operating performance is not different from zero. Our results also indicate that the post-issue operating performance does not have the relation with the initial returns

4.1.3 Relation between Initial Returns and Long-Run Stock Price Performance

We apply three methodologies to study the relation between the initial return and the long-run stock price performance. There are the event-time approach (Table V, Table VI, Table VII, and Table VIII), the calendar-time approach (Table IX and Table X), and multivariate regression (Table XI).

They are two methodologies under the event-time approach. There are the market adjusted returns and the Fama and French three factor model. The results of market adjusted returns are reported in Table V and Table VI, and the results of the Fama and French three factor model are reported in Table VII and Table VIII. The result in Table V shows the market adjusted return in year 0 to 3 periods. The *CARs* of all samples have the negative relation with the initial return. The median and mean *CARs* of all samples are -2.47% and -4.83% with statistical insignificance, respectively. The median of the *CARs* of IPOs in Q1 is -32.05% with 1% statistical significant level, and the mean of the *CARs* of IPOs is -22.06% with 10% statistical significant level. While the median and mean of the *CARs* in Q5 are 6.88% and 0.12% with statistical insignificance. The IPOs in Q5 seem to have a higher *CARs* than the IPOs in Q1. The difference of the median and mean of the *CARs* between IPOs in Q1 and Q5 is -38.93% with 10% statistical significant level, and -22.18% with statistical insignificance. The result in Table VI shows the market adjusted return in year 1, 2, and 3. The *CARs* of IPOs in Q1and Q5 group are negative in the first and the second year. In the first year, the IPOs in Q1 have the lower median of *CARs*, but higher mean *CARs* than the IPOs in Q5. The difference of median and mean of *CARs* between Q1 and Q5 are -11.22% and 6.63% with statistical insignificance. While the median and mean of *CARs* in Q1 are lower than the *CARs* in Q5 in the second and the third year, the difference of median and mean of the *CARs* between Q1 and Q5 in the

second year are -10.62% with statistical insignificance, and -18.33% with 10% statistical significance respectively. In the third year, the difference of median and mean of *CARs* between Q1 and Q5 are -6.57% and -8.52% with statistical insignificance. From our results of market adjusted returns, the *CARs* in Q1 and Q5 are not difference, because the difference between them has the statistical insignificance. Moreover, the initial returns seem to do not have a relation with the *CARs* (the long-run stock price performance).

The results of the Fama and French three-factor model under the event-time approach, in Table VII and Table VIII, shows the abnormal returns (α_{pT}) in year 0 to 3 period. The median and mean of the α_{pT} in Q1 are -0.66% and -0.42% with statistical insignificance, and the median and mean of the α_{pT} in Q5 are 0.29% and -0.05% with statistical insignificance. The median and mean of the α_{pT} in Q1 is less than the α_{pT} in Q5 as -0.95% and -0.37% with statistical insignificance, respectively. Both the median and the mean of the α_{pT} in Q1 have a lower long-run stock price performance than the α_{pT} in Q5 in every period. In year 1, the difference of median of the α_{pT} between Q1 and Q5 is -1.32% with 10% statistical insignificance, and the difference of mean between Q1 and Q5 is -1.06% with statistical insignificance. The difference of median and mean of α_{pT} between Q1 and Q5 in year 2 are -0.62% and -1.05%, both of them have the statistical insignificance. As the same time the difference of median and mean of α_{pT} between Q1 and Q5 in year 3 are -0.12% and -0.62%, both of them also have the statistical insignificance. So the α_{pT} of Q1 is not different with the α_{pT} in Q5. The result is consistent with the result for the market adjusted returns. We can conclude that there is no relation between the initial returns

and the long-run stock price performance under the event-time approach (both the market adjusted returns and the Fama and French three-factor model).

The result of the Fama and French three-factor model under the calendar-time approach is showed in Table IX and Table X. The result of abnormal return (α_{pT}) in year 0 to 3 period is reported in Table IX. The α_{pT} in Q1 is 0.21% with the statistical insignificance, and the α_{pT} in Q5 is 1.05% with statistical insignificance. The α_{pT} in Q1 is lower than the α_{pT} in Q5. The difference between them is -0.84% with statistical insignificance. All of α_{pT} in Q1 is less than α_{pT} in Q5 in every period. The difference between α_{pT} in Q1 and Q5 in year 1, 2, and 3 are -2.90%, -0.48%, and -0.35% respectively. The statistical test of all difference is insignificance. The result indicates that the long-run stock price performance of all periods is not different from zero. So the initial return of IPOs does not relate with the long-run stock price performance under this methodology. The result is consistent with the result of the event-time approach.

The multivariate regression 2 is also applied to study the relation between the initial returns and the long-run stock price performance. The result of multivariate regression 2 is reported in Table XI. In Panel A, the relation between the long-run stock price performance and the initial return is negative in both Q1 and Q5 group in year 0 to 3 period, but both of them have the statistical insignificance. Both IPOs in Q1 and Q5 have the negative relation between the long-run stock price performance and the initial return along two years after the IPOs are listed. Until, the third year, the relation between the long-run stock price performance and the initial return in Q1 and Q5 are positive, but their relations still have the statistical insignificance. The result indicates that the long-run stock price performance and the initial return do not have

the relation between them. The result is consistent with both the event-time approach and the calendar-time approach. Meanwhile the long-run stock price performance seems to have a weak positive relation with the sale growth and total assets.

Concludely, the results of the industry adjusted performance measurement and the multivariate regressions 1 indicate that the post-issue operating performance have the insignificant direction along three years. At the same time, the results of long-run stock price performance measurement as the market adjusted return, the Fama and French three factors model under the event-time approach, the Fama and French three factors model under the calendar-time approach, and the multivariate regression 2 represent that the stock price performance also do not have the significant pattern of improvement along three years. These evidences represent that the initial return does not represent the quality of the issuer and the direction of the stock price performance in U.K. It means that both the post-issue operating performance and the long-run stock price performance do not have the pattern of movement direction consistent with our hypotheses. They do not have the relation with the initial returns. So our results are not consistent with our hypotheses (both the issue discount hypothesis and the aftermarket demand hypothesis). As a result, we reject both the issue discount hypothesis and the aftermarket demand hypothesis.

The results in Table XII to Table XV are the results of long-run stock price performance divided according to the purpose of issuing IPO. The median of initial returns seems to be the proper central value than the mean of initial return, because the initial return of our sample may have the outliers. The results in Table XII indicate that the median of the initial return of IPOs with the specific used of proceed is lower than the IPOs with the general corporate purpose. In Panel A, the median of initial return of a specific corporate purpose group is lower than the initial return of general

corporate purpose group as 0.77% with the statistical insignificance, while the mean of initial return of a specific corporate purpose group is higher than the initial return of general corporate purpose group as 113.45% at 5% statistical significance In Panel B and C, the initial return of the specific use of proceed is lower than the initial return of the general corporate purpose as 0.98% with statistical insignificance, while the initial return of the specific use of proceed is higher than the initial return of the general corporate purpose as 106.70% at 5% statistical significance. The mean of the initial return of specific corporate purpose seems to have the outlier, so the median should be the proper central value instead. In Panel A in Table XII and XIII, the median and mean of the *CAR* with the specific use of proceed is higher than the IPOs with the general corporate purpose along three years. Only the difference of the median and the mean between the specific use of proceed group and general corporate purpose group in year 1 has the statistical significance at 10% while this difference in the other years have the statistical insignificance. At the same time the results in Panel B in Table XII and Table XIII, the median and the mean of α_{pT} of the specific use of proceed group are higher than the general corporate purpose group, except the median and mean of α_{pT} in year 3. However the difference of median and mean between the specific used of proceed and the general corporate purpose has the statistical insignificance in every period except the difference of the median in year 1 which has the statistical significance at 10%. The results, in Panel C in Table XII and Table XIII, of the. The α_{pT} of the specific used of proceed group is lower than general corporate group the others along three years, except the α_{pT} in year 2. However the difference of α_{pT} has the statistical insignificance in every period. The result in Table XIV suggests that the stock abnormal return does not have the relation with the initial return, but the stock abnormal return seem to have a weak relation with the total asset

(proxy of the firm's size). Testing the difference of coefficient of the *INITIAL* term between the specific used of IPO proceed group and the general corporate purpose group is reported in Table XV. The coefficient of interaction term has statistical insignificance in every period, so the coefficient of *INITIAL* of specific used of proceed is not different from the general corporate purpose.

The results indicate that we reject both the hypothesis 3.1 and hypothesis 3.2 because there is no difference of initial return between the group of specific used of IPO proceed and the group of general corporate purpose. The initial return level and the objective of IPO do not have relation with the long-run stock price performance. So both initial return and the objective of IPO do not be the signal of the long-run stock price performance.

4.2 Discussion

The median of initial return of our samples in 1991-2005 period is 9.50%, while Chamber and Dimson (2009), which studied the IPOs in *London Stock Exchange (LSE)*, report median of initial return as 7.76% in 1990-1999 period and 8.70% in 2000-2007 period. Habib and Ljungqvist (2000) study the IPOs on NASDAQ between 1991-1995 period. They document that the median of initial returns in this period is 7.1%. The IPOs in U.K and U.S stock market do not have a large difference of the initial return. Moreover the environment and the regulation in U.K stock market are not different with the U.S stock market, so it is reasonable to compare our evidences with the evidences in U.S stock market.

The prior studies, in U.S stock market, suggest that the post-issue operating performance has a pattern of improvement in the long-run and several of them find

the relation between the post-issue operating performance and the initial return. They suggest that the initial returns of IPOs represent the quality of the issuers. Ritter (1984) finds the negative relation between the post-issue operating performance and the initial return, while Allen and Faulhaber (1989), and Grinbatt and Hwang (1989), and the signaling hypothesis find the positive relation between the post-issue operating performance and the initial return level. Jain and Kini (1994) document the decreasing of the post-issue operating performance in the long-run, but the post-issue operating performance does not have the relation with the initial returns. However our results indicate that the post-issue operating performance of IPOs does not have a pattern of improvement in the long-run and the post-issue operating performance does not have the relation with the initial returns of IPOs. It indicates that the initial return does not represent the quality of issuers or the initial return is not the signal mechanism of the issuers for sending the signal about their quality. The cause is that the operating performance is a noisy proxy for the expected quality of the issuer. So ours evidences do not consistent with the prior evidences in U.S stock market. Jain and Kini (1994) describe the reasons of the decline in the post-issue operating performance into three reasons. Firstly, the increasing of agency costs because of the reduction of ownership management, after the company changes from private company to public company. As a result of the high level of conflict of interest between the initial owners and the shareholders, the firm's performance could suffer as managers have incentives to increase the perquisite consumption. Secondly, the manager may attempt to window-dress the accounting number prior going public. Thirdly, the issuing period may coincide with the period of unusually good performance levels, which the issuers knowing themselves cannot be sustained in the long-run.

The prior studies in U.S stock market try to investigate the relation between the initial returns and the long-run stock price performance. Helwege and Liang (2004) document that the initial return has a negative relation with the long-run stock price performance. Ljungqvist, Nanda, and Singh (2006) suggest that aftermarket demand has a negative relation with the long-run stock price performance, and the aftermarket demand seems to affect to the initial return. So the initial return will have a negative relation with long-run stock price performance, consistent with Helwege and Liang (2004). While our results suggest that the long-run stock price performance does not have the negative improvement along three years, we find the insignificant improvement direction of the stock-price performance. Because the stock price performance is not increase or decrease in the long-run, then our results do not support the existing of market underreaction to the IPOs. If the investors underreact to the IPOs, the long-run stock price performance should have the clearly direction of improvement. Although the excess aftermarket demand remains to exit in U.S stock market, but our results indicate the inexistent of the excess aftermarket demand in LSE. Since the abnormal return in the long-run have the statistical insignificance, so they are not different from zero. This evidence support that the LSE is the efficiency market. The investors cannot get the return higher than the market, because the information about the stock is revealed to the market and included into the stock price. Our results also suggest that the long-run stock price performance does not have the relation with the initial returns. It can be implied that the level of initial return is not the signal about the long-run stock price performance. The initial return should be the compensation for other reasons instead to be the signal. Ritter (1984) finds the positive relation between the risk and initial returns. The higher risk issuers tend to

have the higher initial returns than the lower risk issuers. The initial return is the compensation for the cost of investors to be informed.

Table I: Descriptive of IPOs in 1991 to 2005 Period

This table shows the description of IPOs in 1991 to 2005 period. The first column is the year which IPOs issue. The second column shows the total gross proceed in million pounds unit. The total gross proceed is calculated by the offer price multiply amount of shares issued. The median and mean of initial return are represented in the third and the fourth columns, respectively. The fifth column shows the total money left on the table in million pounds unit, which is calculated as the market price minus the offer price, multiply the amount of shares issued.

Year	Number of Issues	Total Gross Proceed (£m)	Initial Return		Total Money Left on the Table (£m)
			Median	Mean	
1991	13	893.729	0.200	7.920	428.280
1992	7	408.174	0.093	0.073	15.393
1993	17	477.774	0.200	0.139	28.988
1994	72	2,441.359	0.051	0.747	298.217
1995	40	1,203.755	0.054	0.133	108.946
1996	105	3,235.605	0.109	0.108	309.511
1997	76	1,583.84	0.071	1.373	81.873
1998	32	1,803.631	0.118	0.197	242.758
1999	23	1,576.637	0.224	0.936	390.750
2000	120	2,970.316	0.117	0.724	858.567
2001	55	606.364	0.100	0.262	13.437
2002	41	1,614.912	0.090	0.479	63.985
2003	44	1,625.014	0.071	0.160	31.086
2004	142	2,626.826	0.087	0.349	274.829
2005	114	3,910.102	0.111	0.212	396.125
1991-2005	*901*	*26,978.038*	*0.095*	*0.636*	*3,542.746*

Table II: Post-Issue Operating Performance in Year 0 to 3 Period

This table shows the operating performance in year 0 to 3 period divided with five initial return levels. The first column shows the group of initial returns divided into quintile. Q1 is the group of highest initial return, and Q5 is the group of lowest initial return. The second column shows the amount of issuers. The third and fourth columns represent the median and mean of initial returns. The fifth column shows the median of the industry adjusted performance (*IAP*). The *IAP* is calculated by the changed of operating return on asset (ROA) minus median changed in ROA of all firms in industry. The last row shows the difference of median of *IAP* between Q1 and Q5. The Wilcoxon signed ranks test is used to test the statistical significant level of the median of IAP_{pT}. The difference between the IAP_{pT} of Q1 and Q5 is test the statistical significance by Mann-Whitney test. *, **, *** indicate significant levels at 10%, 5% and 1% respectively.

Description	Amount of Issuers	Initial Return		Median of IAP_{pT}
		Median	Mean	
All Sample	679	0.1000	0.6730	0.0186
Q1	136	0.5000	3.1419	0.1116
Q2	136	0.1926	0.1932	-0.1150
Q3	134	0.1000	0.1015	-0.0077
Q4	137	0.0417	0.0428	-0.0150
Q5	136	-0.0204	-0.1180	0.0732
Difference of Q1 and Q5				0.0385

Table III: Post-Issue Operating Performance in Year 1, 2, and 3

This table shows the operating performance in year 1, 2, and 3 divided with five initial return levels. The first column shows the group of initial returns divided into quintile. Q1 is the group of highest initial return, and Q5 is the group of lowest initial return. The second column shows the amount of issuers. The third and fourth columns represent the median and mean of initial returns. The fifth to the seventh column show the median of the industry adjusted performance (*IAP*) in year 1, 2, and 3 respectively. The last row shows the difference of median of *IAP* between Q1 and Q5. The Wilcoxon signed ranks test is used to test the statistical significant level of the median of IAP_{pT}. The difference between the IAP_{pT} of Q1 and Q5 is test the statistical significance by Mann-Whitney test. *, **, *** indicate significant levels at 10%, 5% and 1% respectively.

		Initial Return		**Year 1**	**Year 2**	**Year 3**
Description	**Amount of Issuers**	**Median**	**Mean**	**Median of IAP_{pT}**	**Median of IAP_{pT}**	**Median of IAP_{pT}**
All Sample	677	0.1000	0.6744	-0.0481	0.0047	-0.0525*
Q1	136	0.5000	3.1419	-0.1869*	-0.0781	-0.1031
Q2	135	0.1926	0.1925	0.0026	-0.0466	-0.0204
Q3	135	0.1000	0.1008	0.0333	0.0386	-0.0710
Q4	135	0.0417	0.0424	0.0034	-0.0385	-0.0450
Q5	136	-0.0204	-0.1180	-0.1450	0.0887	-0.0104
Difference of Q1 and Q5				-0.0419	-0.1668	-0.0927

Table IV: Multivariate Regression 1

This table shows the panel regression result of the post-issue operating performance ($LN(IAP)^2$) on the initial return ($LN(1+IR)$) and control variables. Panel A states that multivariate regression 1 in year 0 to 3 period. Panel B, C, and D state that multivariate regression 1 in year 1, 2, and 3 respectively. The control variables are the sale growth (*SG*) and total asset (*LNAsset)*). The sale growth (*SG*) is divided into quartile. The sale growth dummy variable is 1 if the sale growth is in quarter 1 (highest sale growth). The sale growth dummy variable is 2 if the sale growth is in quarter 2. The sale growth dummy variable is 3 if the sale growth is in quarter 3. *, **, *** indicate significant levels at 10%, 5% and 1% respectively.

Panel A: Multivariate Regression 1 from Year 0 to 3

Explanation Variables	All Sample	Q1	Q2	Q3	Q4	Q5
Dependent Variable						
$LN(IAP)^2_{it}$						
Independent Variable						
Constant	2.0683***	0.8102	2.1536	2.3815	2.3610	2.7228**
$LN(1+IR)_{it}$	-0.0076	0.4223*	6.7720	-0.0228	-8.0329	-0.7663*
D=1 if SG in Q1	-0.8239***	-0.8355	-0.8121	-1.2362**	-0.2267	-0.4181
D=2 if SG in Q2	-1.5902***	-2.7748***	-1.2086**	-1.5834***	0.2007	-1.3956**
D=3 if SG in Q3	-1.7224***	-1.8511***	-1.4146**	-1.7049***	-0.9840	-1.7971**
$LN(Asset)_i$	-0.3167***	-0.1401	-0.4808***	-0.3864***	-0.4237***	-0.3702***
F-Statistic	22.5552	7.3589	5.6476	6.1294	3.4716	5.6254
Adjusted R^2	0.2181	0.2181	0.1693	0.1837	0.0986	0.1674
No. of observations	575	115	115	115	114	116

Panel B: Multivariate Regression 1 in Year 1

Explanation Variables	All Sample	Q1	Q2	Q3	Q4	Q5
Dependent Variable						
$LN(IAP)^2_{it}$						
Independent Variable						
Constant	0.6436	-1.1314	-0.6493	-2.2780	2.5096	2.2471
$LN(1+IR)_{it}$	-0.2565	0.3848	12.5785	24.4725*	-28.0256	-1.4363***
D=1 if SG in Q1	0.3642	1.0595	0.2707	0.4382	0.2484	-1.1937
D=2 if SG in Q2	-0.6665*	-0.4825	-0.1320	-1.1971*	-0.6547	-0.7304
D=3 if SG in Q3	-1.5165***	-1.8912**	-1.0686	-1.2594*	-1.1864*	-2.2209**
$LN(Asset)_i$	-0.1993***	-0.0111	-0.3477*	-0.1753	-0.3008**	-0.2897*
F-Statistic	10.4641	3.3319	2.4767	3.4538	2.8748	3.3509
Adjusted R^2	0.0762	0.0928	0.0608	0.0972	0.0766	0.0927
No. of observations	575	115	115	115	114	116

Panel C: Multivariate Regression 1 in Year 2						
Explanation Variables	All Sample	Q1	Q2	Q3	Q4	Q5
Dependent Variable						
$LN(IAP)^2_{it}$						
Independent Variable						
Constant	2.0303***	3.3920***	0.2810	0.7634	2.8802*	2.9458*
$LN(1+IR)_{it}$	0.1494	0.4437	10.1537	-3.3206	-20.6357	-0.3794
D=1 if SG in Q1	-0.4005	-1.6414**	-0.6292	0.7082	0.1862	-0.6083
D=2 if SG in Q2	-1.2264***	-2.2832***	-0.2649	-1.0455	-2.1440***	-0.8653
D=3 if SG in Q3	-1.4008***	-2.0290***	-0.7794	-0.5411	-1.8475**	-1.3526
$LN(Asset)_i$	-0.3282***	-0.4188***	-0.3986**	-0.2306	-0.3214**	-0.3870**
F-Statistic	11.6665	4.9605	1.7280	1.9646	4.9369	2.1386
Adjusted R^2	0.0850	0.1480	0.0312	0.0406	0.1484	0.0468
No. of observations	575	115	115	115	114	116

Panel D: Multivariate Regression 1 in Year 3						
Explanation Variables	All Sample	Q1	Q2	Q3	Q4	Q5
Dependent Variable						
$LN(IAP)^2_{it}$						
Independent Variable						
Constant	2.2286***	-0.1551	3.3101	5.8351***	0.5997	1.0742
$LN(1+IR)_{it}$	-0.0250	0.1059	11.8218	-1.7683	3.6454	-0.1395
D=1 if SG in Q1	-0.8585**	-0.5733	-1.3799	-1.6049	-1.2041	0.4987
D=2 if SG in Q2	-1.7083**	-1.7251**	-1.8987**	-2.5536***	-1.4112	-1.2966
D=3 if SG in Q3	-1.881***	-1.6740**	-2.5399***	-3.4839***	-1.6660*	-1.4664
$LN(Asset)_i$	-0.3280***	-0.0725	-0.6252***	-0.6426***	-0.1601	-0.2624
F-Statistic	12.6892	1.5243	3.7083	13.7931	1.1590	2.0950
Adjusted R^2	0.0926	0.0225	0.1070	0.3594	0.0070	0.0451
No. of observations	575	115	115	115	114	116

Table V: Market Monthly Adjusted in Event-Time Approach in Year 0 to 3 Period

This table shows the long-run stock price performance in year 0 to 3 periods divided with five initial returns levels. The first column shows the group of initial returns divided into quintile. Q1 is the group of highest initial return, and Q5 is the group of lowest initial return. The second column shows the amount of issuers. The third and fourth columns represent the median and mean of initial returns. The fifth and the sixth column show the median and the mean of the cumulative abnormal returns (*CAR*). The mean is the equally weighted average of *CAR*. The Wilcoxon signed ranks test is used to test the statistical significant level of median of CAR_{pT}. The *t-statistical* is applied to test the statistical significant level of the mean of CAR_{pT}. The difference of the CAR_{pT} between Q1 and Q5 is test the statistical significance by Mann-Whitney for testing of the median and *t-statistical* for testing of the mean. *, **, *** indicate significant levels at 10%, 5% and 1% respectively.

Description	**Amount of Issuers**	**Initial Return**		**Median of CAR_{pT}**	**Mean of CAR_{pT}**
		Median	**Mean**		
All Sample	728	0.0994	0.7416	-0.0247	-0.0483
Q1	146	0.4940	3.4737	-0.3205***	-0.2206*
Q2	146	0.1967	0.1992	0.1205	0.0272
Q3	145	0.0994	0.1000	-0.0214	-0.0985
Q4	146	0.0429	0.0418	-0.0324	0.0506
Q5	145	-0.0250	-0.1172	0.0688	0.0012
Difference of Q1 and Q5				-0.3893*	-0.2218

Table VI: Market Monthly Adjusted in Event-Time Approach in Year 1, 2, and 3

This table shows the long-run stock price performance in year 1, 2, and 3 divided with five initial returns levels. The cumulative abnormal return is reported by median and mean. The first column shows the group of initial returns divided into quintile. Q1 is the group of highest initial return, and Q5 is the group of lowest initial return. The second column shows the amount of issuers. The third and fourth columns represent the median and mean of initial returns. The fifth and the sixth column show the median and the mean of the cumulative abnormal returns (*CAR*) in year 1. The seventh and the eighth column show the median and the mean of *CAR* in year 2. The ninth and the tenth column show the median and the mean of *CAR* in year 3. The Wilcoxon signed ranks test is used to test the statistical significant level of median of CAR_{pT}. The t-statistical is applied to test the statistical significant level of the mean of CAR_{pT}. The difference of the CAR_{pT} between Q1 and Q5 is test the statistical significance by Mann-Whitney for testing of the median and *t-statistical* for testing of the mean. *, **, *** indicate significant levels at 10%, 5% and 1% respectively.

		Initial Return		**Year 1**		**Year 2**		**Year 3**	
Description	**Amount of Issuers**	**Median**	**Mean**	**Median of CAR_{pT}**	**Mean of CAR_{pT}**	**Median of CAR_{pT}**	**Mean of CAR_{pT}**	**Median of CAR_{pT}**	**Mean of CAR_{pT}**
All Sample	728	0.0994	0.7416	-0.0435**	-0.0362	-0.0580***	-0.0798***	0.0343	0.0677*
Q1	146	0.4940	3.4737	-0.2013**	-0.0427	-0.1111***	-0.2021***	0.0413	0.0242
Q2	146	0.1967	0.1992	0.0491	0.0712	-0.0532	-0.0543	0.0377	0.0101
Q3	145	0.0994	0.1000	0.0168	-0.0953*	-0.0157	-0.0396	-0.0148	0.0357
Q4	146	0.0429	0.0418	0.0169	-0.0205	-0.0953	-0.0833	-0.0093	0.1541
Q5	145	-0.0250	-0.1172	-0.0891*	-0.0944	-0.0049	-0.0188	0.1070*	0.1144*
Difference of Q1 and Q5				-0.1122	0.0663	-0.1062	-0.1833*	-0.0657	-0.0852

Table VII: Fama and French Three-Factor Model in Event-time Approach in Year 0 to 3 Period

This table shows the long-run stock price performance in year 0 to 3 period divided with five initial returns level. The abnormal returns come from the intercept (α_{iT}) of Fama and French three factors model ($R_{it} - R_{ft} = \alpha_{iT} + \beta_{iT}(R_{mt} - R_{ft}) + s_{iT}SMB_t + h_{iT}HML_t + \varepsilon_{iT}$). The α_{pT} is the equally weighted average of α_{iT} according to the group of initial return level. The Wilcoxon signed ranks test is used to test the statistical significant level of median of α_{pT}. The t-statistical is applied to test the statistical significant level of the mean of α_{pT}. The difference of the α_{pT}. between Q1 and Q5 is test the statistical significance by Mann-Whitney for testing of the median and *t-statistical* for testing of the mean *, **, *** indicate significant levels at 10%, 5% and 1% respectively.

Description	Amount of Issuers	Initial Return		Median of α_{pT}	Mean of α_{pT}
		Median	Mean		
All Sample	901	0.0950	0.6364	0.0008	-0.0003
Q1	181	0.4697	2.9664	-0.0066	-0.0042
Q2	180	0.1900	0.1896	-0.0020	-0.0009
Q3	180	0.0946	0.0967	0.0047	0.0020
Q4	180	0.0411	0.0402	0.0024	0.0021
Q5	180	-0.0250	-0.1239	0.0029	-0.0005
Difference of Q1 and Q5				-0.0095	-0.0037

Table VIII: Fama and French Three-Factor Model in Event-Time Approach in Year 1, 2, and 3

This table shows the long-run stock price performance in year 1, 2, and 3 divided with five initial returns level. The abnormal returns come from the intercept (α_{iT}) of Fama and French three factors model ($R_{it} - R_{ft} = \alpha_{iT} + \beta_{iT}(R_{mt} - R_{ft}) + s_{iT}SMB_t + h_{iT}HML_t + \varepsilon_{iT}$). The α_{pT} is the equally weighted average of α_{iT} according to the group of initial return level. The t-statistical is applied to test the statistical significant level of the mean of α_{pT}. The fifth and sixth column shows the median and mean of the α_{pT} in year 1. It is the same in the seventh and eighth column for year 2, and the ninth and tenth column in year 3. The Wilcoxon signed ranks test is used to test the statistical significant level of median of α_{pT}. The t-statistical is applied to test the statistical significant level of the mean of α_{pT}. The difference between the α_{pT} of Q1 and Q5 is test the statistical significance by Mann-Whitney test of the median testing and *t-statistical* for the mean testing. *,**,*** indicate significant levels at 10%, 5% and 1% respectively.

		Initial Return		**Year 1**		**Year 2**		**Year 3**	
Description	**Amount of Issuers**	**Median**	**Mean**	**Median of α_{pT}**	**Mean of α_{pT}**	**Median of α_{pT}**	**Mean of α_{pT}**	**Median of α_{pT}**	**Mean of α_{pT}**
All Sample	901	0.0950	0.6364	-0.0021*	-0.0052**	-0.0027	-0.0038*	-0.0020	0.0033
Q1	181	0.4697	2.9664	-0.0150***	-0.0143**	-0.0089**	-0.0123**	-0.0033	0.0001
Q2	180	0.1900	0.1896	0.0051	0.0037	-0.0026	-0.0037	-0.0049	-0.0076
Q3	180	0.0946	0.0967	-0.0035	-0.0116**	0.0027	0.0048	-0.0008	0.0057
Q4	180	0.0411	0.0402	0.0014	7.65E-06	-0.0016	-0.0058	0.0052	0.0122
Q5	180	-0.0250	-0.1239	-0.0018	-0.0037	-0.0027	-0.0018	-0.0020	0.0064
Difference of Q1 and Q5				-0.0132*	-0.0106	-0.0062	-0.0105	-0.0012	-0.0062

Table IX: Fama and French Three-Factor Model in Calendar-time Approach in Year 0 to 3 Period

This table shows the long-run stock price performance in year 0 to 3 divided into five initial returns level. The abnormal returns come from the intercept (α_{pT}) of Fama and French three factors model ($R_{pt} - R_{ft} = \alpha_{pT} + \beta_{pT}(R_{mt} - R_{ft}) + s_{pT}SMB_t + h_{pT}HML_t + \varepsilon_{pT}$). The *t-statistical* is applied to test the difference of the α_{pT} between Q1 and Q5 group. *,**,*** indicate significant levels at 10%, 5% and 1% respectively.

Description	Amount of Issuer (N)	Initial Return		α_{pT}
		Median	Mean	
All Sample	901	0.0950	0.6364	0.0029
Q1	181	0.4697	2.9664	0.0021
Q2	180	0.1900	0.1896	0.0040
Q3	180	0.0950	0.0969	0.0021
Q4	180	0.0411	0.0402	6.1E-05
Q5	180	-0.0250	-0.1239	0.0105
Difference of Q1 and Q5				-0.0084

Table X: Fama and French Three-Factor Model in Calendar-Time Approach in Year 1, 2, and 3

This table shows the long-run stock price performance in year 1, 2, and 3 divided into five initial returns level. The abnormal returns come from the intercept (α_{pT}) of Fama and French three factors model ($R_{pt} - R_{ft} = \alpha_{pT} + \beta_{pT}(R_{mt} - R_{ft}) + s_{pT}SMB_t + h_{pT}HML_t + \varepsilon_{pT}$ The *t-statistical* is applied to test the difference of the α_{pT} between Q1 and Q5 group. *,**,*** indicate significant levels at 10%, 5% and 1% respectively

Description	Amount of Issuers	Initial Return		Year 1	Year 2	Year 3
		Median	Mean	α_{pT}	α_{pT}	α_{pT}
All Sample	901	0.0950	0.6364	0.016**	-0.0029	0.0016
Q1	181	0.4697	2.9664	0.0077	-0.0047	2.2E-05
Q2	180	0.1900	0.1896	0.0157***	0.0061	-0.0005
Q3	180	0.0950	0.0969	0.0071	-0.0035	-0.0018
Q4	180	0.0411	0.0402	0.0042	-0.0071	0.0012
Q5	180	-0.0250	-0.1239	0.0367	0.0001	0.0035
Difference of Q1 and Q5				-0.0290	-0.0048	-0.0035

Table XI: Multivariate regression 2

This table shows the panel regression result of the long-run stock price performance (*AR*) on the initial return (*LN(1+IR)*) and control variables. Panel A states that multivariate regression 1 in year 0 to 3 period. Panel B, C, and D state that multivariate regression 2 in year 1, 2, and 3 respectively. The control variables are the sale growth (*SG*) and total asset (*LN(TA)*). The sale growth (*SG*) is divided into quartile. The sale growth dummy variable is 1 if the sale growth is in quarter 1 (highest sale growth). The sale growth dummy variable is 2 if the sale growth is in quarter 2. The sale growth dummy variable is 3 if the sale growth is in quarter 3. *,**,*** indicate significant levels at 10%, 5% and 1% respectively.

Panel A: Multivariate Regression 2 from Year 0 to 3						
Explanation Variables	All Sample	Q1	Q2	Q3	Q4	Q5
Dependent Variable						
AR_{it}						
Independent Variable						
Constant	-0.0369***	-0.0684***	-0.0335	-0.0280	-0.0309	-0.0319*
$LN(1+IR)_{it}$	-0.0038	-0.0026	0.0782	0.1224	-0.4436	-0.0071
D=1 if SG in Q1	0.0124***	0.0184	0.0099	0.0117	0.0283***	0.0019
D=2 if SG in Q2	0.0079*	-0.0122	0.0134*	0.0060	0.0098	0.0148
D=3 if SG in Q3	0.0036	0.0052	-0.0024	0.0065	0.0002	0.0055
$LN(TA)_i$	0.0037*	0.0074***	0.0021	0.0019	0.0045***	0.0029
F-Statistic	6.4229	3.3107	1.4689	0.6178	3.5348	1.4608
Adjusted R^2	0.0524	0.1055	0.0238	-0.0201	0.1156	0.0230
No. of observations	599	120	123	124	120	118

Panel B: Multivariate Regression 2 in Year 1						
Explanation Variables	All Sample	Q1	Q2	Q3	Q4	Q5
Dependent Variable						
AR_{it}						
Independent Variable						
Constant	-0.0641***	-0.0644*	-0.0233	-0.0948	-0.0667**	-0.0490*
$LN(1+IR)_{it}$	-0.0066	-0.0175*	0.0646	0.6105**	0.1820	-0.0005
D=1 if SG in Q1	0.0238***	0.0042	0.0033	-0.0133	-0.0048	-0.0035
D=2 if SG in Q2	0.0245***	0.0343*	0.0111	0.0050	-0.0026	0.0138
D=3 if SG in Q3	0.0147**	0.0053	0.0046	-0.0088	-0.0019	0.0059
$LN(TA)_i$	0.0050***	0.0065*	0.0018	0.0039	0.0068***	0.0041
F-Statistic	6.8539	2.2988	0.2296	1.7182	2.0292	0.9827
Adjusted R^2	0.0467	0.0517	-0.0326	0.0284	0.0415	-0.0007
No. of observations	599	120	123	124	120	118

Panel C: Multivariate Regression 2 in Year 2						
Explanation Variables	All Sample	Q1	Q2	Q3	Q4	Q5
Dependent Variable						
AR_{it}						
Independent Variable						
Constant	-0.0362***	0.0037	0.0079	-0.0016	-0.0888***	-0.0642**
$LN(1+IR)_{it}$	-0.0059	-0.0135	-0.1008	0.2070	-0.3330	-0.0154*
D=1 if SG in Q1	0.0106	-0.0163	0.0183	0.0036	0.0380**	-0.0027
D=2 if SG in Q2	0.0112	-0.0316*	0.0399***	0.0021	0.0494**	-0.0027
D=3 if SG in Q3	0.0082	-0.0420**	0.0193	0.0150	0.0294*	-0.0037
$LN(TA)_i$	0.0032**	0.0028	-0.0013	-0.0013	0.0070**	0.0068**
F-Statistic	2.4516	1.4329	1.9104	0.3661	3.5805	1.7612
Adjusted R^2	0.0120	0.0179	0.0360	-0.0264	0.0978	0.0315
No. of observations	599	120	123	124	120	118

Panel D: Multivariate Regression 2 in Year 3						
Explanation Variables	All Sample	Q1	Q2	Q3	Q4	Q5
Dependent Variable						
AR_{it}						
Independent Variable						
Constant	0.0077	-0.0314	-0.0282	-0.0053	0.1353	0.0525
$LN(1+IR)_{it}$	-0.0056	0.0022	0.1635	-0.3717	-1.4060	0.0202
D=1 if SG in Q1	0.0194	0.0199	0.0244	0.0114	0.0481	-0.0140
D=2 if SG in Q2	0.0108	0.0373	-0.0107	-0.0224	0.0221	-0.0167
D=3 if SG in Q3	0.0134	0.0169	0.0117	0.0091	0.0135	-0.0056
$LN(TA)_i$	-0.0008	0.0001	0.0001	0.0053	-0.0082	-0.0023
F-Statistic	0.6714	0.5325	0.7197	0.9280	1.0492	0.4425
Adjusted R^2	-0.0034	0.0278	-0.0148	-0.0037	0.0025	-0.0293
No. of observations	575	115	115	115	114	116

Table XII: Long-run Stock Price Performance of "Used of IPO Proceed" Variable by Event-Time Approach and Calendar-Time Approach in Year 0 to 3 Period

This table shows the panel result of the long-run stock price performance, in year 0 to 3 period, divided with the purpose of issuing IPOs. The purpose of issuing IPOs is divided into two groups: i) specific use of proceed, and ii) general corporate purpose. Panel A shows the results of the long-run stock price performance measurement by using the market adjusted return. Panel B shows the results of the long-run stock price performance measurement by using the Fama and French three factors model under the event-time approach. Panel C shows the results of the long-run stock price performance measurement by using the Fama and French three factors model under the calendar-time approach. The Wilcoxon signed ranks test and *t-statistical* are used for testing the statistical significance of median and mean of the initial return and the abnormal return, respectively. The difference of the initial return and the abnormal return between the group of a specific use of IPO proceed and the group of general corporate purpose is test the statistical significance by Man-Whitney for testing of the median, and *t-statistical* for testing of the mean. *,**,*** indicate significant levels at 10%, 5% and 1% respectively.

Panel A: Result of the Market Adjusted Return

Description	Amount of Issuers	Initial Return		Median of CAR_{pT}	Average CAR_{pT}
		Median	Mean		
All Sample	499	0.1048***	0.6862***	-0.0490	-0.1120**
A Specific Use of IPO Proceed	186	0.0994***	1.390**	0.0612	0.0019
General Corporate Purposes	313	0.1071***	0.2555***	-0.1177*	-0.1797***
Difference		-0077	1.1345**	0.1789*	0.1816

Panel B: Result of the FF Three-Factor Model under Event-time Approach

Description	Amount of Issuers	Initial Return		Median	a_p
		Median	Mean		
All Sample	560	0.1000***	0.6349***	0.0011	-0.0020
A Specific Use of IPO Proceed	207	0.0950***	1.3075**	0.0025	-0.0007
General Corporate Purposes	353	0.1048***	0.2405***	-0.0013	-0.0028
Difference		-0.0098	1.0670**	0.0038	0.0021

Panel C: Result of the FF Three-Factor Model under Calendar-time Approach

Description	Amount of Issuers	Initial Return		a_p
		Median	Mean	
All Sample	560	0.1000***	0.6349***	0.0047
Specific Use of Proceed	207	0.0950***	1.3075**	0.0004
General Corporate Purposes	353	0.1048***	0.2405***	0.0119
Difference		-0.0098	1.0670**	-0.0115

Table XIII: Long-run Stock Price Performance of "Used of IPO Proceed" Variable by Event-Time Approach and Calendar-Time Approach in Year 1, 2, and 3

This table shows the result of the long-run stock price performance, in year 1, 2, and 3 divided with the purpose of issuing IPOs. The purpose of issuing IPOs is divided into two groups: i) the specific use of proceed, and ii) the general corporate purpose. Panel A shows the results of the long-run stock price performance measurement by using the market adjusted return. Panel B shows the results of the long-run stock price performance measurement by using the Fama and French three factors model under the event-time approach. Panel C shows the results of the long-run stock price performance measurement by using the Fama and French three factors model under the calendar-time approach. The Wilcoxon signed ranks test and *t-statistical* are used for testing the statistical significance of median and mean of the initial return and the abnormal return, respectively. The difference of the initial return and the abnormal return between the group of a specific use of IPO proceed and the group of general corporate purpose is test the statistical significance by Man-Whitney for testing of the median, and *t-statistical* for testing of the mean. *,**,*** indicate significant levels at 10%, 5% and 1% respectively.

Panel A: Result of the Market Adjusted Return

		Initial Return		**Year 1**		**Year 2**		**Year 3**	
Description	**Amount of Issuers**	**Median**	**Mean**	**Median of CAR_{pT}**	**Average CAR_{pT}**	**Median of CAR_{pT}**	**Average CAR_{pT}**	**Median of CAR_{pT}**	**Average CAR_{pT}**
All Sample	499	0.1048	0.6862	-0.0308*	-0.0454	-0.0553**	-0.0756**	0.0331	0.0090
Specific Use of Proceed	186	0.0994	1.3900	-0.0018	0.0230	-0.0222	-0.0398	0.0429	0.0187
General Corporate Purposes	313	0.1071	0.2555	-0.0554**	-0.0860**	-0.0699**	-0.0969***	0.0174	0.0032
Difference		-0077	1.1345**	0.0538*	0.1090*	0.4770	0.5710	0.0255	0.0155

Panel B: Result of the FF Three-Factor Model under Event-time Approach

Description	Amount of Issuers	Initial Return		Year 1		Year 2		Year 3	
		Median	Mean	Median	a_p	Median	a_p	Median	a_p
All Sample	560	0.1000	0.6349	-0.0013*	-0.0070***	-0.0028	-0.0054**	-0.0029	-0.0012
Specific Use of Proceed	207	0.0950	1.3075	0.0018	-0.0027	-0.0012	-0.0036	-0.0042	-0.0017
General Corporate Purposes	353	0.1048	0.2405	-0.0044**	-0.0094***	-0.0035*	-0.0065**	0.0006	-0.0009
Difference		-0.0098	1.0670**	0.0062*	0.0067	0.0023	0.0029	-0.0048	-0.0008

Panel C: Result of the FF Three-Factor Model under Calendar-time Approach

Description	Amount of Issuers	Initial Return		Year1	Year2	Year3
		Median	Mean	a_p	a_p	a_p
All Sample	560	0.1000	0.6349	0.0179*	-0.0045	0.0018
A Specific Use of IPO Proceed	207	0.0950	1.3075	0.0114*	-0.0030	-0.0052
General Corporate Purposes	353	0.1048	0.2405	0.038*	-0.0055	0.0059
Difference		-0.0098	1.0670**	-0.0266	0.0025	-0.0111

Table XIV: Multivariate regression 2 of "Used of IPO Proceed" Variable

This table shows the regression result of the long-run stock price performance (*AR*) on the initial return (*LN(1+IR)*) and control variables. Panel A states that multivariate regression 1 in year 0 to 3 period. Panel B, C, and D state that multivariate regression 2 in year 1, 2, and 3 respectively. The control variables are the sale growth (*SG*) and total asset (*LN(Asset)*). The sale growth (*SG*) is divided into quartile. The sale growth dummy variable is 1 if the sale growth is in quarter 1 (highest sale growth). The sale growth dummy variable is 2 if the sale growth is in quarter 2. The sale growth dummy variable is 3 if the sale growth is in quarter 3. *,**,*** indicate significant levels at 10%, 5% and 1% respectively.

Panel A: Multivariate Regression 2 in Year 0-3

Explanation Variables	All Sample	Specific Used of Purpose	General Corp. Purpose
Dependent Variable			
AR_{it}			
Independent Variable			
Constant	-0.0421***	-0.0370**	-0.0429***
$LN(1+IR)_{it}$	-0.0046	-0.0043	-0.0089
D=1 if SG in Q1	0.0114**	0.0002	0.0171***
D=2 if SG in Q2	0.0034	0.0008	0.0079
D=3 if SG in Q3	0.0028	0.0001	0.0030
$LN(Asset)_i$	0.0043***	0.0043***	0.0041***
F-Statistic	5.7441	1.9087	4.2211
Adjusted R^2	0.0719	0.0393	0.0767
No. of observations	307	112	195

Panel B: Multivariate Regression 2 in Year 1

Explanation Variables	All Sample	Specific Used of Purpose	General Corp. Purpose
Dependent Variable			
AR_{it}			
Independent Variable			
Constant	-0.0531***	-0.0455*	-0.0576***
$LN(1+IR)_{it}$	-0.0077	-0.0114*	-0.0040
D=1 if SG in Q1	-0.0088	-0.0231	0.0020
D=2 if SG in Q2	0.0111	-0.0020	0.0118
D=3 if SG in Q3	0.0070	-0.0001	0.0152
$LN(Asset)_i$	0.0051***	0.0059**	0.0046***
F-Statistic	6.1211	3.2885	2.6271
Adjusted R^2	0.0638	0.0756	0.0335
No. of observations	377	141	236

Panel C: Multivariate Regression 2 in Year 2			
Explanation Variables	All Sample	Specific Used of Purpose	General Corp. Purpose
Dependent Variable			
AR_{it}			
Independent Variable			
Constant	-0.0422***	-0.0322	-0.0516***
$LN(1+IR)_{it}$	-0.0083*	-0.0095	-0.0027
D=1 if SG in Q1	0.0109	0.0148	0.0081
D=2 if SG in Q2	0.0102	0.0074	0.0121
D=3 if SG in Q3	0.0114	0.0223	0.0054
$LN(Asset)_i$	0.0038***	0.0025	0.0049***
F-Statistic	2.9001	1.4921	1.8738
Adjusted R^2	0.0246	0.0173	0.0183
No. of observations	377	141	236

Panel D: Multivariate Regression 2 in Year 3			
Explanation Variables	All Sample	Specific Used of Purpose	General Corp. Purpose
Dependent Variable			
AR_{it}			
Independent Variable			
Constant	0.3440*	-0.0312	-0.0287
$LN(1+IR)_{it}$	0.0051	0.0039	-0.0189
D=1 if SG in Q1	-0.0544	-0.0081	0.0179
D=2 if SG in Q2	-0.0095	-0.0047	0.0315
D=3 if SG in Q3	-0.0859	-0.0018	0.0070
$LN(Asset)_i$	-0.0123	0.0039	0.0027
F-Statistic	0.3522	0.2943	1.6031
Adjusted R^2	-0.0107	-0.0328	0.0153
No. of observations	307	112	195

Table XV: Test Difference of Initial Return between Specific Used of Proceed and General Corporate Purpose

This table shows the regression result of the long-run stock price performance (*AR*) on the dummy variable, initial return (*LN(1+IR)*), and interaction term. The dummy variable is 1 if the sample is in specific used of IPO proceed.. *,**,*** indicate significant levels at 10%, 5% and 1% respectively.

Explanation Variables	Year 1	Year 2	Year 3	Year 0 to 3
Dependent Variable				
AR_{it}				
Independent Variable				
Constant	0.0552***	-0.0097**	0.0087	0.0001
$LN(1+IR)_{it}$	0.0590***	0.0116*	-0.0063	0.0039
D=1 if Specific Used of Proceed	0.0032	0.0131	-0.0179	-1.72E-05
$D_1LN(1+IR)_{it}$	-0.0044	-0.0137	0.0216	-0.0045
F-Statistic	71.7359	1.1533	0.5471	0.6848
Adjusted R^2	0.3761	0.0013	-0.0044	-0.0030
No. of observations	353	353	314	314

Chapter V

Conclusion

Since the previous studies assume the different factors which can represent the initial return, they are the issue discount by issuer and the aftermarket demand of investors. This is the unsettled conclusion. The objective of this thesis is to investigate whether initial return on IPOs reflects an issue discount by the issuer or the aftermarket demand of investors.

Because previous studies suggest that the initial return have relation with the post-issue operating performance and the long-run stock price performance, and the initial return can represent the quality of the issuer and the performance of stock. The improvement of the post-issue operating performance and the long-run stock price performance seem to have the pattern in the long-run. So we decide to apply the relation of the initial return with the post-issue operating performance and the long-run stock price performance under the issue discount and the aftermarket demand. The reason is to make the conclusion of the unsettled debated. We have three hypotheses which we want to test. They are the issue discount hypothesis, the aftermarket demand hypothesis, and the used of IPO proceed hypothesis. The issue discount hypothesis and the aftermarket demand hypothesis are the hypotheses that are useful to answer the thesis question, and we decide to divide the sample with the initial return level into quintile. While the used of IPO proceed hypothesis is a further test to get more evidence, we divide the sample with the used of IPO proceed purpose.

There are two methodologies used to study about the post-issue operating performance. Firstly, the post-issue operating performance is measured by the industry adjusted performance (*IAP*). The results show the statistical significance of the median of *IAP* along three years, so the median of *IAP* is not different from zero. The difference of the median of *IAP* between the group of high initial return (Q1) and the group of low initial return (Q5) has the statistical insignificance, so the median of *IAP* in Q1 is not different from the median of *IAP* in Q5. Then the initial return level does not have the relation with the post-issue operating performance. It means that the initial return is not the signal of the post-issue operating performance or the issuer's quality. Secondly, the multivariate regression is used for study about the relation between the *IAP* and the initial return. The results suggest that the initial return does not have the relation with the *IAP*. So the initial return is not the signal of the firm's quality. The result of the multivariate regression is consistent with the result of the measuring of post-issue operating performance by the industry adjusted performance (*IAP*).

There are three methodologies used to study about the long-run stock price performance. Firstly, the event-time approach is applied to measure the long-run stock price performance. The results of the event-time approach, both the market adjusted return and the Fama and French three factors model, show the statistical insignificance of both median and mean of the abnormal return. It means that the median and the mean of the abnormal return are not different from zero. At the same time, the difference between the median and the mean of the abnormal return of IPOs in Q1 and Q5 also has the statistical insignificance, so it is not different between them. Secondly, the calendar-time approach is applied to measure the long-run stock price performance. The Fama and French three factors model is used under this

approach. The results suggest that both the abnormal return of the IPOs and the difference of the abnormal return of IPOs in Q1 and Q5 have the statistical insignificance. The results of the calendar-time approach are consistent with the results of the event-time approach. Thirdly, the multivariate regression is used to represent the relation between the abnormal return and the initial return. The results suggest that there is no relation between the initial return and the abnormal return. The results are consistent with the results from the event-time approach and the calendar-time approach. All results indicate that the abnormal return in the long-run is not different from zero, and the initial return does not have the relation with the long-run stock price performance. So the initial return is not the signal of the long-run stock price performance. The results suggest that the long-run stock price performance does not have the increasing or decreasing pattern as the evidence in U.S stock market. It means that the abnormal return is not different from zero. The results support that the LSE is the efficient market. Moreover the results indicate that the investors do not underreact to both high quality and low quality stocks. The evidences are not consistent with the hypothesis, so we reject both issue discount hypothesis and aftermarket demand hypothesis.

All results of the long-run stock price performance divided according to the "used of IPO proceed" variable support the results of the long-run stock price performance divided according to the initial returns level. We reject both hypothesis 3.1 and hypothesis 3.2, because the evidences are not consistent with our hypotheses. The difference of initial return between the specific used of proceed group and general corporate purpose group has statistical insignificance. So the initial return of specific used of proceed is not different from the initial return of general corporate purpose. It can be conclude that the initial return and the objective of IPO issuing do

not have the relation with the long-run stock price performance and both of them are not the signal of the long-run stock price performance. The results are consistent with the above evidences

Our results are not consistent with the evidence in U.S stock market which is documented in the prior studies. Because the post-issue operating performance and the long-run stock price performance do not have the relation with the initial return of IPO, so we reject both the issue discount hypothesis and the aftermarket demand hypothesis. The initial return is not the signal of the post-issue operating performance and the long-run stock price performance. The issuers may discount the offer price for the other reasons instead sending the signal about their quality. Ritter (1984) finds the positive relation between the risk and initial returns. The initial return is the compensation for the cost of investors to be informed.

The used of the pre-IPO data of the issuer to study whether initial return on IPOs reflects an issue discount by the issuer or the aftermarket demand of investors and to decompose the initial return of IPO is the suggestion for the further study. To decompose the initial return is the other way to study the initial return. It can be represented the proportion of the issue discount and the aftermarket demand in the initial return.

References

Allen, F., and Faulhaber, G. R., "Signaling by Underpricing in the IPO Market," The Journal of Financial Economics, 23, 2 (Aug.1989): 303-323

Barber, B. M., and Lyon, J. D, "Detecting abnormal operating performance: The empirical power and specification of test statistics," Journal of Financial Economics, 41, 3 (July 1996): 359-399

Barber, B. M., and Lyon, J. D., "Detecting long-run abnormal stock returns: The empirical power and specification of test statistics," Journal of Financial Economics, 43, 3 (Mar. 1997): 341-372

Beatty, R. P., and Ritter, J. R., "Investment Banking, Reputation, and the Underpricing of Initial Public Offerings," The Journal of Financial Economics, 15, 1-2, (Jan./Feb. 1986): 213-232

Bernard, V., "Stock Price Reaction to Earnings Announcements," in R. Thaler ed. Advances in Behavioral Finance, Russel Sage Foundation, New York, (1992)

Black, F., "Noise," The Journal of Finance, 41, 3 (July. 1986): 529-543

Chan, L. K. C., Jegadeesh, N., and Lakonishok, J. "Momentum Strategies," The Journal of Finance, 51, 5 (Dec.1996): 1681-1713

Dimson, E., Nagel, S., Quigley, G., " Capturing the Value Premium in the U.K. 1955-2001," Working Paper, London Business School," (Jan. 2003)

Fama, E. F., "Discount under uncertainty," Journal of Business, 69, 4 (Oct.1996): 415-428

Fama, E. F., "Market efficiency, long-term returns, and behavioral finance," Journal of Financial Economics, 49, 3 (Sept. 1998): 283-306

Fama, E. F., and French, K. R., "Common risk factors in the returns on stocks and bonds," Journal of Financial Economics, 33, 1 (Feb. 1993): 3-56

Fama, E. F., and French, K. R., "Multifactor Explanations of Asset Pricing Anomalies," The Journal of Finance, 51, 1 (Mar. 1996): 55-84

Grinbatt, M., and Hwang, C. Y., "Signaling and the Pricing of New Issues," The Journal of Finance, 44, 2 (June 1989): 393-420

Gujarati, D. N., Basic Econometrics, (International edition: McGraw-Hill/Irwin, 2003) Page 306-310

Habib, M. A., and Ljungqvist, A. P., "Underpricing and Entrepreneurial Wealth Losses in IPOs: Theory and Evidence," forthcoming in Review of Financial Studies, (Feb. 2000)

Helwege, J., and Liang, N., "Initial Public Offerings in Hot and Cold Markets," Journal of Financial and Quantitative Analysis, 39, 3 (Sept. 2004): 541-569

Jain, B. A. and Kini Omesh, "The Post-Issue Operating Performance of IPO Firms," The Journal of Finance, 49, 5 (Dec. 1994): 1699-1726

Kadiyala, P., and Rau, P. R., "Investor Reaction to CorporateEvent Announcements: Underreaction or Overreaction?," Journal of Business, 77, 2 (April 2004): 357-386

Kothari, S. P., Sabino, J. S., and Zach, T., "Implication of Data Restrictions on Performance Measurement and Tests of Rational Pricing," Working Paper, Sloan School of Management, and William E. Simon Graduate School of Business Administration, (Nov. 1999)

Leone, A. J., Rock, S., and Willenborg, M., "Disclosure of Intended Use of Proceeds and Underpricing in Initial Public Offerings" Journal of Accounting Research, 45, 1 (Mar. 2007): 111-151

Ljungqvist, A., Nanda, V., and Singh, R., "Hot Markets. Investor Sentiment, and IPO Pricing," The Journal of Business, 79, 4 (July 2006): 1667-1702

Loughran, T. and Ritter, J. R., "The New Issues Puzzle," The Journal of Finance, 50, 1 (Mar. 1995): 23-51

Lowry, M., "Why does IPO Volume Fluctuate So Much?," The Journal of Financial Economics, 67, 1 (Jan. 2003): 3-40

Lyon, J. D., Barber, B. M., and Tsai, C., "Improved Methods for Tests of Long-run Abnormal Stock Returns," The Journal of Finance, 54, 1 (Feb. 1999): 165-201

Mitchell, M. L. and Stafford, E., "Managerial Decisions and Long-Term Stock Price Performance," Journal of Business,73, 3 (July 2000): 287-329

Myers, S. and Majluf , N. S, "Corporate Financing and Investment Decisions when Firms have Information that Investors Do Not Have", Journal of Financial Economics, 13, 2, (June 1984), 187-222.

Pearson, J. N., and Wisner, J. D., "Using volume and economies of scale to benefit long-term productivity," Industrial Management, 35, 6 (Nov.-Dec. 1993), 13-16

Poterba, J., and Summers, L., "Mean-reversion in stock prices: Evidence and Implications," Journal of Financial Economics, 22, 1 (Oct. 1988): 27-59

Rajan, B. and Servaes, H., "Analyst Following of Initial Public Offerings," The Journal of Finance, 52, 2 (June 1997): 507-529

Ritter, J. R., "The Hot Issue Market of 1980," The Journal of Business, 57, 2 (April 1984): 215-240

Ritter, J. R., "The Long-run Performance of Initial Public Offerings," The Journal of Finance, 46, 1 (Mar. 1991): 3-27

Ritter, J. R., "Investment Banking and Securities Issuance," Handbook of the Economics of Finance, Edited by G.M. Constantinides, M. Harris and R. Stulz, 1, 5 (2003): 254-304

Ritter, J. R. and Welch, I., "A Review of IPO Activity, Pricing, and Allocations," The Journal of Finance, 57, 4 (Aug. 2002): 1795-1828

Rock, K., "Why New Issues are Underpriced," The Journal of Financial Economics, 15, 1-2 (Jan.-Feb. 1986): 187-212

Spiess, D. K. and Pettway, R. H., "The IPO and first seasoned equity sale: Issue proceed, owner/managers' wealth, and the underpricing signal," The Journal of Banking & Finance, 21, 7 (July 1997): 967-988

Appendices

Appendix A: Test of Statistical Significance of the Market Adjusted Return in the Event-time Approach

This appendix provides the methodology to test the equally weighted average cumulative abnormal return ($\overline{CAR}_{pT}$) of the market adjusted return. We want to test the hypothesis that the $\overline{CAR}_{pT}$ is or is not different from zero as the following:

H_0: $\overline{CAR}_{pT} = 0$

H_1: $\overline{CAR}_{pT} \neq 0$

The t-statistic is use to test the statistical significant level as:

$$t = \frac{\overline{CAR}_{pT}}{\sigma_p / \sqrt{N}} \qquad (15)$$

$\overline{CAR}_{pT}$ is the equally-weighted average cumulative abnormal return of each interested group or portfolio at each interested horizons (calculated in equation *(7)*). σ_p is the standard deviation of the abnormal return in each group or portfolio. *N* is the amount of sample in each group or portfolio.

We can calculate the standard deviation (σ_p) in each group or portfolio from:

$$\sigma_p = \sqrt{\frac{\sum_{i=1}^{N}(CAR_{iT} - \overline{CAR}_{pT})^2}{N-1}} \qquad (16)$$

where, CAR_{iT} is the cumulative abnormal return of each stock from equation *(6)*. $\overline{CAR}_{pT}$ is the cumulative abnormal return of each group or portfolio calculated from equation *(7)*. N is the amount of stock in each group of portfolio.

Appendix B: Calculation of the SMB and HML Variables in the Fama and French Three-Factor Model

We derive the SMB_t and HML_t variables follow Fama and French (1993) and Dimson, Nagel, and Quigley (2003) as the steps following :

1. Size of stock is calculated from the amount of stock issue multiply the offering price,

$$Size = Amount\ of\ Stock\ Issued \times Offer\ Price$$

2. Sorted sample according to the size of stock and divided them into two groups (small and big) with median.

3. Sorted sample in each size group in step 2 (small size and big size) according to book-to-market (BE/ME)

4. Divided the data in step 3 into three groups as high BE/ME (30%), medium BE/ME (40%), and low BE/ME (30%)

5. After we divide the data with size (small size and big size in step 2) and BE/ME (high BE/ME, medium BE/ME, and low BE/ME in step 3), we will get six portfolios as S/H, S/M, S/L, B/H, B/M, B/L.

6. We average the data in each portfolio in step 5 by value weighted average (VW).

7. The SMB_t is calculated from the simple average return of small size portfolio minus the simple average return of big size portfolio.

$$SMB_t = \text{Simple Average Return of Small Size Portfolio (S/H, S/M, and S/L)}_t - \text{Simple Average Return of Big Size Portfolio (B/H, B/M, and B/L)}_t$$

8. The HML_t is calculated from the simple average return of high BE/ME portfolio minus the simple average return of low BE/ME portfolio.

$$HML_t = \text{Simple Average Return of High BE/ME Portfolio (S/H and B/H)}_t - \text{Simple Average Return of Low BE/ME Portfolio (S/L and B/L)}_t$$

Appendix C: Test of Statistical Significance of the Fama and French Three-Factor Model in the Event-time Approach

This appendix provides the methodology to test the equally weighted average of abnormal return ($\bar{\alpha}_{pT}$) of the market adjusted return. We want to test the hypothesis that the $\bar{\alpha}_{pT}$ is or is not different from zero as the following:

H_0 : $\bar{\alpha}_{pT} = 0$

H_1 : $\bar{\alpha}_{pT} \neq 0$

We apply the *t*-statistic in order to test the statistical significant level. The *t*-statistic is derived from the cross-sectional of abnormal returns at the interested horizons in each interested group or portfolio. As shown below we apply the $\bar{\alpha}_{pT}$ as the equally-weighted average abnormal return of each group or portfolio (calculated from equation *(9)*), σ_p as the standard deviation of the abnormal return of each group or portfolio, *N* is the amount of our sample in each group or portfolio.

$$t = \frac{\bar{\alpha}_{pT}}{\sigma_p / \sqrt{N-1}} \qquad (17)$$

We derive the σ_p from the time-series of event-study abnormal return of group or portfolio as following:

$$\sigma_p = \sqrt{\frac{\sum_{i=1}^{N} (\alpha_i - \bar{\alpha}_{pT})^2}{N-1}} \qquad (18)$$

where, α_i is the abnormal return of stock *i*. $\bar{\alpha}_{pT}$ is the equally-weighted average of abnormal return in each group or portfolio. *N* is the amount of stock in each group or portfolio.

BIORGRAPHY

Athitaya Kanjanamethakul, raised in Phuket, Thailand graduated from the Faculty of Business Administration, Kasetsart University majoring in Finance. After graduated in March 2005, she worked as the account officer at the Bangkok Bank around one year. In year 2007, she enrolled and studied in the Master of Science in Finance (MSF) program at the Faculty of Commerce and Accountancy, Chulalongkorn University.