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Tang Zhang

The Aftermarket Performance of Initial Public Offerings:

The Hong Kong Experience (2000-2004)

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Author:	**Tang Zhang**
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Name of the Supervisor:	**Timo Rothovius**
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ABSTRACT

This paper investigated the stock return performance of the initial public offering stocks which are listed on the main board of Hong Kong Stock Exchange during the years 2000 to 2004. The results clearly show that Hong Kong main board IPOs are overpriced on average especially those IPOs in the years 2000 and 2001. This phenomenon may probably be explained by the collapse of the Dot-Com boom. Moreover, in the long term, the IPOs significantly underperformed the market in overall based on the CARs and BHARs methodologies.

By splitting the samples based on the H-share IPOs and non H-share IPOs, the aftermarket performance is comparatively better in the H-share group than in the non H-share group. This result may be derived from the stronger economic growth rate on the mainland China than in Hong Kong from the beginning of last decade of 20th century.

When investigating the aftermarket performance categorized by the year of issuance, we find poorer long term performance associated with the heavy volume of IPO in certain years and this result proves that the issuing firms are taking advantage of "windows of opportunity".

Key words: initial public offerings, overpricing, underperformance, H-share, CARs, BHARs

1. INTRODUCTION

Initial Public Offerings (IPOs) occurs when a private company sells stocks to the public for the first time. After the IPOs procedure the company's shares are listed on a stock exchange, such as Hong Kong Stock Exchange (HKSE for short) and these shares can be bought and sold through the stock exchange. After going public, the listing companies are subject to the legal, regulatory and disclose requirements that lead to better corporate governance. IPOs are often issued by smaller and/or younger companies seeking capital to expand by selling ownership stakes to investors who believe in the company' future prospects. IPOs can also be issued by large privately-owned companies seeking to become publicly-traded firms.

Many studies have examined the performance of new equity issues and there is an increase amount of literature for countries outside the U.S. A lot of evidences show that there exist two main IPO-related phenomena: the short-run underpricing phenomenon, and poor long term performance of IPOs. It is now widely accepted that the IPOs generate positive initial returns as reported in Loughran, Ritter & Rydqvist (2006). Ritter & Welch (2002) systematically present the theoretical explanations of short-run underpricing. They classify the theories of underpricing based on whether asymmetric information or symmetric information between the IPO issuers and investors.

Another interesting issue related to new equity issuing is the long-run underperformance of IPOs. According to Ritter (1991:4), several reasons explain why the long-run performance of initial public offerings is an intriguing research of area: First, from the investors' perspective, they could generate greater profits if they adopt the active trading strategies. Second, the nonzero aftermarket performance phenomenon conflicts the efficiency markets hypothesis (EMH) which indicate that nobody can achieve consistently huge returns to the risks in the securities markets (Kuppi & Martikainen 1994:5). Third, the number of IPOs varies in the different years. This indicates that the issuers can take advantage of "windows of opportunities" by successfully timing new

issues if the poor long term performance is related to the high volume periods.

The choices of the Hong Kong main board as the target for this research are because: 1) The capital market is mature and well regulated in Hong Kong (Carey & Steen 2006). It has been developed into an international financial and trade center with the greatest concentration of corporate headquarters in the Asia-Pacific region, for instance 70 of the world' top 100 banks are located in Hong Kong; 2) Lack of enough empirical studies on the IPO performance using the latest data on the main board of Hong Kong stock market given its size and importance of the Hong Kong Stock Exchange (HKSE); 3) The strong economic growth of the mainland China from the beginning of last decade of 20th century, more Chinese mainland enterprises have adopted the oversea IPO to attract the investment funds especially through the Hong Kong stock market. It is for these reasons that this study investigates the aftermarket performance of those IPO stocks compared to the overall performance of Hong Kong stock market and also those non China mainland companies.

Figure 1 presents the comparison of annual GDP growth rate between mainland China and Hong Kong during the years 2000 and 2004. This table clearly shows the economic growth was significantly stronger on the mainland China than in Hong Kong from the year 2000. The table further illustrates that the dramatic decline of economic growth in Hong Kong after late of year 2000 was partially due to the collapse of the Dot-Com boom. This study also explores the effect of the collapse of the Dot-Com boom on the IPO stock performance after going public. This is one of the contributions of this paper to the IPO literature. The other contributions are: this paper provides the latest international evidence of IPOs performance using the updated data on the main board of Hong Kong; by splitting the sample into two groups: China enterprise and non China enterprise, this study explores the "China effect" on the performance of IPOs both in the short-run and long term.

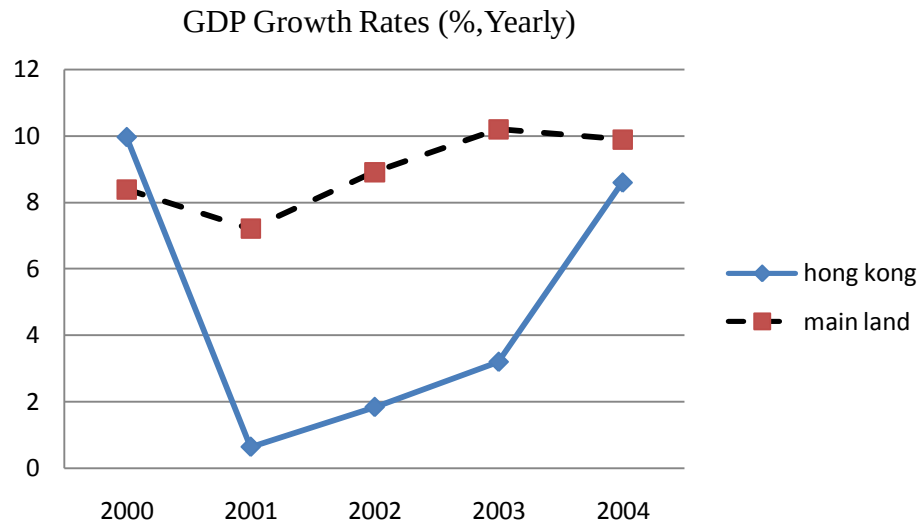

Figure 1. The annual GDP Growth Rate of Mainland China and Hong Kong in the period of 2000 to 2004**.** (Source: IMF International Financial Statistics (IFS); the National Bureau of Statistics of China (PRC))

1.1 The research problem and hypothesis

This paper sheds light on the stock return performance of the initial public offering stocks which are listed on the main board of Hong Kong Stock Exchange (HKSE) during the years 2000 to 2004. So this study provides one case of international evidence on both short-run and long term performance of initial public offerings.

The first hypothesis of this study is related to the initial return of IPOs, which is defined as the return between the offering price and the first closing day price. Loughran et al. (2006) summarize the empirical results of the short-run performance with a sample of 39 countries, and show that the short-run underpricing phenomenon prevails in all of the 39 countries even though the amount of underpricing varies among countries. So we assume the first hypothesis is as following:

H_1: Initial public offerings are underpriced on the Hong Kong Main board

Even though the long term performance is a controversial topic in the literature of IPOs research (Ahmad-Zaluki, Campbell & Goodacre 2007), the long term underperformance prevails in many countries (see e.g. Ritter 1998). Ritter & Welch (2002) summarize the following several reasons why the IPO stocks are underperformed in the long-run: windows of opportunities; divergence of opinions; fads and over-optimism. So the second research purpose of this study is to test whether that the issuing firms during 2000-2004 substantially underperformed the stock market in overall from the closing price on the first day of public trading to their three-year anniversaries. So the second hypothesis is as following:

H_2 : Post-IPO stocks underperform in the long-run on the Hong Kong Main Board

In the previous section, the strong economic growth of mainland China during the sample period was mentioned and more Chinese mainland companies went to public through the Hong Kong stock market. IPO companies are separated into two groups: H share and non-H stocks. (According to the definition from Hong Kong Exchange and Clearing Limited (website: http://www.hkex.com.hk/index.htm):H-share companies are companies incorporated in the People's Republic of China and approved by the China Securities Regulatory Commission for a listing in Hong Kong. Shares in these companies are listed on the Stock Exchange, subscribed for and traded in Hong Kong dollars, or other currencies, and referred to as H shares. After finding its way into the Listing Rules, the term H share has been accepted and is widely used in the market. The letter H stands for Hong Kong).

Figure 2 shows the comparison of the performance between the Hang Seng China Enterprise index (H-share index) and Hang Seng index in Hong Kong during the years 2000 to 2007. (H-share index was launched in 1994 to track the performance of all the H-shares of China enterprise, Hang Seng index a free-float capitalization-weighted index of selection of companies from the Stock Exchange of Hong Kong, and it is the main indicator of the overall market performance in Hong Kong consisting 43 big companies. (http://www.hsi.com.hk/)). This graph clearly presents the overall performance of the H-

share companies was better than the overall market in the most period of time. Those H-share companies are registered on the mainland China and the main business of those companies is based in mainland China. So the two following hypothesis of this study expect the H-share companies perform better than non H-share companies both in the short-run and long term:

H_3: The performance of average initial returns is better with H-share stocks than non H-share stocks

H_4: The average long-run performance is better with H-share stocks than non H-share stocks

Figure 2. The comparison of performance between H-share index and Hang Seng index during the years 2000 to 2007. (Source: http://finance.yahoo.com)

When the investors are especially optimistic about the growth potential of the companies going public, the issuing firms attempt to time their IPOs to take advantage of these swings in investor sentiment, so volume of IPOs varies in the different years. Several studies have already showed the poor long-run returns on IPOs are consistent with those issuers going public in the high volume period (see e.g. Ritter 1991, Loughran & Ritter 1995). The next hypothesis of this study is:

H_5: Low long-run return for the stocks issued in the high volume period of IPOs

1.2 Reviews of previous studies

A seminal article by Ibbotson (1975) reported a negative relation between initial returns of the IPOs and long-run share price performance for a sample of the U.S. IPOs issued during the period 1960-69. Ibbotson found that average returns for one month holding periods were positive in the first year after IPO, negative performance in the next three years and again positive performance in the fifth year.

Ritter (1991), using a sample of 1,526 IPOs, that went public in the U.S. market in the 1975-84 period, analyzed the price performance of returns from the first trading day to the third annual day with the matching non-issuers, found out after going public these

public firms significantly underperformed with a ratio of 0.83. And with the measure of cumulative average adjusted returns (CARs) calculated with monthly portfolio rebalancing, where the adjusted returns are computed using several different benchmarks, he concluded the substantial variation in underperformance (see figure 3). He concluded that IPOs make bad medium- to long term investments. In his paper, he also argued that younger companies and going public in heavy volume years did even worse than average. This phenomenon can be explained as in the “hot issue” markets, IPO volume was one of the explaining variables for the pool performance and the young growth firms take advantage of these “window of opportunity”.

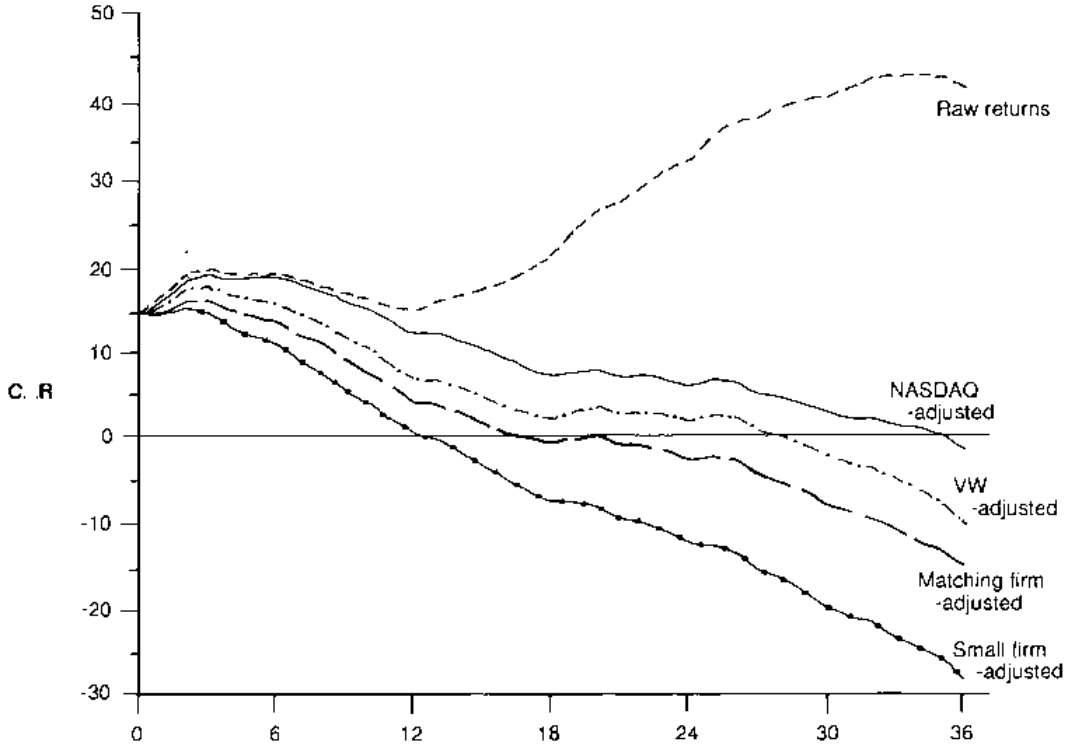

Figure 3. Cumulative average adjusted return for an equally-weight portfolio of 1,526 initial public offerings in 1975-84, with monthly rebalancing.

Loughran & Ritter (1995) confirmed the long term underperformance of IPOs with a sample from 1970-1990 and documented that during five years after the issue, investors have received average return of only 5 percent per year for companies going public compared the nonissuesers of the same size with a rate of 12 percent. Furthermore the evidence of this paper is consistent with a market where firms take advantage of window of opportunity by issuing equity when, on average, they are substantially overvalued. In addition, the underperforming varies over periods: the issuers that issue during a low-activity offering period underperformance less than the ones who issue on the high-activities offering period.

Khurshed, Mudambi & Goergen (1999) explored the long term performance of IPO is a function of various pre-IPO factors; the manner in which a company operates before it is listed on the stock exchange gives a strong signal of how its shares will perform in its first few years after going to the public. Using the IPOs on the London Main Market from

1991 to 1995, they find the long term underperformance of 17.81% and that the percentage of equity issued and the degree of multinationality are critical predictors of IPO performance.

Espenlaud, Gregory & Tonks (2000) re-examed the evidence on the long term abnormal performance of 588 IPOs in the UK from 1985-1997 under a number of alternative benchmarks and approached. They found that the long term underperformance over 3 years irrespective of the benchmark used, however, over 5 years after the IPO crucially depend on the choice of technique and the statistical significance of underperformance is even less marked if these returns are measured in calendar time.

Ritter & Welch (2002) reviewed the literature about the IPO issues, such as, issuing activity, underpricing, and long-run underperformance. They summarized the theory why firms choose to go public and the primary answer is “the desire to raise equity capital for the firm and to create a public market in which the founders and other shareholders can convert some of their wealth into cash at a future data. Non-financial reasons, such as increased publicity, play only a minor role for most firms: absent cash considerations, most entrepreneurs would rather just run their firms than concern themselves with the complex public market process”. And furthermore, they concluded several theories of the going public decision approach including life cycle theories, market-timing theories, and the changing composition of IPO issuers and so on.

Loughran, Ritter & Rydqvist (2006) summarized the updated international evidence of the equally-weighted average initial returns in a number of countries. The overall results in the table 1 show that underpricing phenomenon unanimously prevails in all 39 countries.

Table 1. The international evidence of average initial returns for 39 countries. (Source: Loughran et al. 2006)

Country	Source	Sample Size	Time Period	Avg. Initial Return
Australia	Lee, Taylor & Walter; Woo	381	1976-1995	12.1%
Austria	Aussenegg	83	1984-2002	6.3%
Belgium	Rogiers, Manigart & Ooghe; Manigart DuMortier	93	1984-2004	14.2%
Brazil	Aggarwal, Leal & Hernandez	62	1979-1990	78.5%
Canada	Jog & Riding; Jog & Srivastava Kryzanowski & Rakita	500	1971-1999	6.3%
Chile	Aggarwal, Leal & Hernandez; Celis & Maturana	55	1982-1997	8.8%
China	Datar & Mao; Gu and Qin (A shares)	432	1990-2000	256.9%
Denmark	Jakobsen & Sorensen	117	1984-1998	5.4%
Finland	Keloharju; Westerholm	99	1984-1997	10.1%
France	Husson & Jacquillat; Leleux & Muzyka; Paliard & Belletante; Derrien & Womack; Chahine	571	1983-2000	11.6%
Germany	Ljungqvist; Rocholl	545	1978-2001	31.1%
Greece	Nounis, Kazantzis & Thomas	363	1976-2005	25.1%
Hong Kong	McGuinness; Zhao & Wu; Ljungqvist & Yu	857	1980-2001	17.3%
India	Krishnamurti & Kumar	98	1992-1993	35.3%
Indonesia	Hanafi; Ljungqvist & Yu; Danny	265	1989-2003	20.2%
Iran	Bagherzadeh	279	1991-2004	22.4%
Israel	Kandel, Sarig & Wohl; Amihud & Hauser	285	1990-1994	12.1%
Italy	Arosio, Giudici & Paleari; Cassia, Paleari & Redondi	181	1985-2001	21.7%
Japan	Fukuda; Dawson & Hiraki; Hebner & Hiraki; Pettway & Kaneko; Hamao, Packer, & Ritter; Kaneko & Pettway	1,689	1970-2001	28.4%
Korea	Dhatt, Kim & Lim; Ihm; Choi & Heo	477	1980-1996	74.3%
Malaysia	Isa; Isa & Yong	401	1980-1998	104.1%
Mexico	Aggarwal, Leal & Hernandez	37	1987-1990	33.0%
Netherlands	Wessels; Eijgenhuijsen & Buijs; Jenkinson, Ljungqvist, & Wilhelm	143	1982-1999	10.2%
New Zealand	Vos & Cheung; Camp & Munro	201	1979-1999	23.0%
Nigeria	Ikoku	63	1989-1993	19.1%
Norway	Emilsen, Pedersen & Saettem	68	1984-1996	12.5%
Philippines	Sullivan & Unite	104	1987-1997	22.7%
Poland	Jelic & Briston	140	1991-1998	27.4%
Portugal	Almeida & Duque	21	1992-1998	10.6%
Singapore	Lee, Taylor & Walter; Dawson	441	1973-2001	29.6%
South Africa	Page & Reyneke	118	1980-1991	32.7%
Spain	Ansotegui & Fabregat	99	1986-1998	10.7%

Country	Source	Sample Size	Time Period	Avg. Initial Return
Sweden	Rydqvist; Schuster	332	1980-1998	30.5%
Switzerland	Drobetz, Kammermann & Walchli	120	1983-2000	34.9%
Taiwan	Lin & Sheu; Liaw, Liu & Wei	293	1986-1998	31.1%
Thailand	Wethyavivorn & Koo-smith; Lonkani & Tirapat	292	1987-1997	46.7%
Turkey	Kiymaz	163	1990-1996	13.1%
United Kingdom	Dimson; Levis; Ljungqvist	3,122	1959-2001	17.4%
United States	Ibbotson, Sindelar & Ritter; Ritter	15,333	1960-2005	18.1%

And from the last decade of 20th century, more studies have provided international evidence on the long-run underperformance of IPOs which is consistent with what has been observed in the U.S. market. Drobetz, Kammermann & Wälchli (2005) investigated the Swiss IPO market by measuring the long term performance of Swiss IPO up to 120 month after going public and found out the average market adjusted initial return is 34.97%, however the long term underperformance tends to be significant only in the long run, i.e., after four year of secondary market trading and beyond. Other studies are: Aggarwal, Leal & Hernandez (1993) for Latin America, Keloharju (1993) for Finland, Lee, Taylor & Walter (1996) for Australia, Ljungqvist (1997) for Germany, Kooli & Suret (2003) for Canada report average market-adjusted losses of 47.0%, 8.1%, 46.5%, 12.1% and 16.86% respectively, by the third year anniversary of their first trade. These results show that long-run underperformance phenomenon is not only unique in the U.S. market.

There are several papers examining IPO performance on the Hong Kong main board and growth enterprise markets (GEM). McGuinness (1992) investigated 980 IPOs in Hong Kong from 1980 and 1990 inclusively and found that most of the post-listing cumulative returns are contributed by the close of the first trading day. Dewenter & Field (2001) examined the infrastructure firm IPOs with relaxed listing requirement in the period from 1996 to first half of 1997. They find that investment banks will avoid highly speculative issues in order to protect their reputations.

Cheng, Cheung & Po (2004) investigated the intra-day pattern of the 159 IPOs listed on the Stock Exchange of Hong Kong during the period of September 1995 and December 1998. They indicate that the initial underpricing for the IPO firms is 12.3 percent and IPO underpricing occurs only at the pre-listing market and disappear afterward.

Cheng, Cheung & Tse (2006) investigated the impact of the listing regulatory changes occurred in 1994 on the short-run and long term performance of IPOs on the main board of Hong Kong stock market. The results show that the IPOs significantly underperformed the market index over three years period based on the Buy-and-Hold strategy. The average market adjusted returns for one-year, two-year and three-year periods are -9.8%, -29.9% and -58.1% respectively and the average initial return is 19%. However, they find there are no significant changes of the performance of IPOs before and after the regulatory changes.

Agarwal, Liu & Rhee (2006) tested the relationship between the pre-offering investors demand for the IPOs and the aftermarket performance. They find that the IPOs with high investor demand realize large positive initial returns but negative longer run excess returns, while the IPOs with low investor demand realize negative initial returns but perform relatively well in the longer run. They argue that this phenomenon can be explained by the speculative bubble hypothesis instead of information asymmetry hypothesis or the underpricing hypothesis.

Carey & Steen (2006) investigated the initial returns of IPOs on the Hong Kong stock market during the years 1995 and 1999. They find the initial returns are relative with the market condition, and provide the evidence that during the “hot” market, the level of underpricing is significantly higher. But they did not find the association between H-share IPOs and IPO underpricing.

Chan, Moshirian, Ng & Wu (2007) examined the stock return performance of IPOs listed on the growth enterprise market (GEM) in Hong Kong from 1999 to 2001. In the study, they find the initial return is 43 percent on average, however, in the long term, IPO stocks

are significantly underperformed based on the market index benchmark. During this period, “technology boom” emerged and they proved that this is the key factor affected the underperformance of GEM stocks. And they found that like the previous studies, the results are sensitive to the adoption of benchmarks and the methodologies.

1.3 Structure of the study

The theoretical background for this study is provided in the next two chapters. In the chapter two, the market efficiency theorem is discussed and the two main phenomena, underpricing and underperformance, relative to initial pricing offering are also mentioned within this chapter. Chapter three contains the stock valuation and how to pricing the listing stocks. The overview feature of Hong Kong equity market is introduced in the chapter four including the advantages and disadvantages of going public and the process of public offering to the Hong Kong Stock Exchange. Chapter five presents the data used in this study and the methodology. Chapter six presents and analyzes the results. Finally chapter seven concludes this research and some ideas for the future research are also given in this chapter.

2. MARKET EFFICIENCY THEOREM

In finance, the market efficiency theory is a central concept and it had been anticipated at the beginning of last century in the dissertation by Bachelier (1990) for his PHD in mathematics. And in his opening paragraph, he mentioned that "past, present, and even discounted future events are reflected in market price, but often show no apparent relation to price changes". In order to comprehend this theory, it is necessary to look briefly the function of the capital markets. According to the definition by Copeland, Weston & Shastri (2005:353-354) the primary function of the capital markets is the transfer funds between lenders and borrowers efficiently. The existing capital markets allow companies, for example, to have better access to large investments by providing an opportunity to borrow money for their investments. For savers, the capital markets provide an environment to lend the needed money to the companies for getting higher return than they might otherwise earn.

During this chapter about market efficiency theorem, the concept of perfect capital markets from the theoretical point of view will be described firstly. Then Random walk model and efficient market hypothesis will be introduced separately. After that, we will discuss about the anomalies, especially related to the IPO underpricing and underperformance anomalies. The last but not the least, behavioral finance, from the social science perspective including psychology and sociology (Shiller 2003) will be mentioned as another perspective to explain the IPO anomalies.

2.1 Perfect capital markets

With a better understanding of efficient markets, it would be better to correlate them with perfect capital markets. According to the finance theory, the perfect capital markets have to achieve four following terms (Copeland et al.2005: 353-354, Shapiro 1991):

(1) There is no friction in markets. Thus, markets have no taxes, transaction costs or constraining legislation. Furthermore, the investment targets can be completely classified

and marked.

(2) There is perfect competition in product and security markets. Every producer offers its products at minimum average costs in product markets and all the parties' trade at market price in security markets.

(3) Markets are informationally efficient. The information is free and available to all parties simultaneously. All the market parties are harmonious in interpretation of the information.

(4) All the investors rationally maximize their benefits.

The perfect capital markets direct the funds efficiently. In markets like these all the information is reflected immediately into security prices and the saved funds are directed optimally to investments that the most profitable. However, all the assumptions presented above are theoretical and they do not appear in real markets, such as the positive information and trading costs existing in the real world. Nevertheless, the concept of ideal markets provides a satisfactory base to evaluate the efficiency of existing markets(Copeland et al. 2005: 353-354) and it is a clear benchmark to determine what are reasonable information and trading costs.(Fama 1970).

2.2 Random walk-model

In financial time series, Random walk (RW)-model is a model showing the movement of prices and consistent with the notion of market efficiency. And in the seminal research, French mathematician Louis Bachelier (1900) developed an elaborate mathematical theory of speculative prices and found the prices of French government bonds were consistent with the random walk model. And Mills (1999) systematically presents the following random walk-models:

The most natural way to state formally the random walk model is as:

(1) $$P_t = P_{t-1} + a_t$$

Where P_t is the price observed at the beginning of time t and a_t is an error term which has zero mean and whose values are independent of each other. The price change, $\Delta P_t = P_t - P_{t-1}$, is thus simply a_t and hence is independent of past price changes. And by successive backward substitution in (1), it can be written as the current price as the accumulation of all past errors, i.e.

(2) $$P_t = \sum_{t=1}^{t} a_t$$

So that the random walk model implies that prices are indeed generated by cumulating of pure random changes.

Furthermore, there are several theories concerning the random walk-model. The basic model, fair game, meaning that, across the large sample, the expected return on an asset equals its actually return on average. (Copeland et al. 2005: 367-368). Martingale is a stochastic process that is the mathematical model of a fair game. The mathematics model is:

(3) $$E(X_t - X_s \mid \xi_t) = 0$$

Whenever $s \leq t$, ξ_t is the σ-algebra comprising events determined by observations over the intervals [0, t].

Submartingale is a fair game where tomorrow' price is expected to be higher than today's price. Thus, the expected returns are positive. Written as:

(4) $$E(X_t - X_s \mid \xi_t) \geq 0,\ s \leq t$$

And to the case where the above inequality is reversed, giving as a supermartingale. (Copeland et al. 2005: 367-368)

2.3 Efficient market hypothesis and three forms of market efficiency

An efficient capital market is one in which stock prices fully reflect available information. The efficient-market hypothesis (EMH) has implication for investors and for firms. (Ross, Westerfield and Jaffe 2002:342)

(1) Because information is reflected in prices immediately, investors should only expect to obtain a normal rate of return. Awareness of information when it is released does an investor no good. The price adjusts before the investor has time to trade on it.

(2) Firms should expect to receive the fair value for securities that they sell. Fair means that the price they receive for the securities they issue is the present value. Thus, valuable financing opportunities that arise from fooling investors are unavailable in efficient capital markets.

Fama (1970) defined the efficient market and put it into a simple way. He defines the market is efficient : a) if all security prices fully reflect all know market information and b) no traders in the market have monopoly control of information. Then Fama (1970) classified the well known three levels of market efficiency in his study. Three forms of market efficiency are described briefly according to the level of information reflected in the security prices:

(i) Weak-form efficiency: if the stock prices already reflect all information that can be derived by examining market trading data such as the history of past prices, trading volumes, or short interest. And weak-form efficiency is presented mathematically as:

(5) $$P_t = P_{t-1} + \text{Expected return} + \text{Random error}_t$$

This equation states that the price today is equal to the sum of the last observed price plus the expected return on the stock plus a random component occurring over the interval. The expected return is a function of a security' risk and would be based on the models of risk and return. The random component is due to new information on the stock and it could be either positive or negative and has an expectation of zero.

(ii) Semistrong-from efficiency: if the prices reflect (incorporate) all publicly available information, including information such as published accounting statements for the firm as well as historical price information.

(iii) Strong-form efficiency: if prices reflect all information, even including information available only to company insiders. (Ross et al. 2002:341-347; Bodie, Kane & Marcus 2005:373)

The information set of past prices is a subset of the information set of public set of publicly available information, which in turn is a subset of all information. The relationship among the three different information set is showed in the figure 4. Semistrong-from efficiency implied weak-from efficiency and strong-from efficiency implies semistong-from efficiency. (Ross et al, 2002:346).

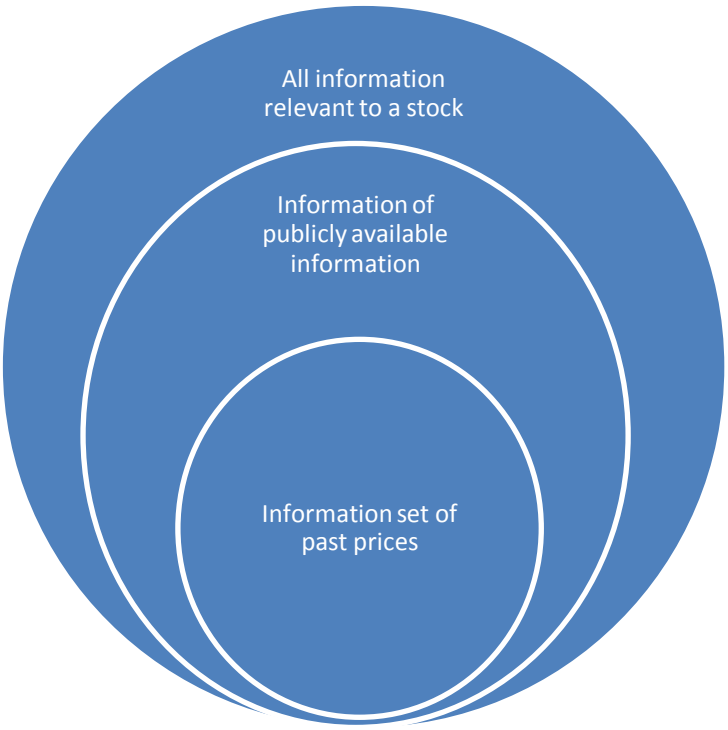

Figure 4. Relationship among Three Different Information Sets. (Source: Ross et al. 2002)

According to the previous research, Fama (1991) reinterpreted the market efficient hypothesis. The table 2 shows the comparison between the old classification and the new version.

Table 2. Comparison of market hypothesis categories.

Fame (1970)	Fama (1991)
Weak-form test	Test for return predictability
Semi-strong form test	Event study
Strong-form test	Test for private information

In this study (Fama 1991), he pointed out that event study is the cleanest method to test the market efficiency and event study can provide quite clear picture to present the speed

of adjustment of securities prices to information. Furthermore, he concluded that the prices adjust efficiently to the firm-specific information. Referring to the test for private information, “the investors studied in most detail for private information are pension fund and mutual fund managers”. But the test about whether the investor managers have access to the private information will meet the joint-hypothesis problem: “measured abnormal returns can result from market inefficiency, a bad model of market equilibrium, or problems in the way the model is implemented”. And he concluded that the professional managers actually have rare private information because the rise of passive investment strategies. Return predictability is the controversial part in the market efficiency theory. Recent studies “on the predictability of long-horizon stock returns from past returns is high on drama but short on precision”. Furthermore, depending on other variables, such as dividend yields, P/E ration, term spread and so on, predictability of returns is more reliable.

2.4 Anomalies

In the last section, we discussed about the market efficiency, but in the real world, we have observed some phenomenon contradicting the efficient market hypothesis, such as Small-Firm-in-January, P/E effect, Book-to-Market Ratios, The Weekend effect, Holiday effects and so on. In finance, these are referred to as effect market anomalies. Thaler (1987) explained these price behaviors from the perspective of institutional consideration, and those are A) the custom of buy-sell stocks coincides with calendar changes, so the prices may be influenced by the inflow and outflow of funds in the market. B) “Window dressing” refers to the institutional investors clean up their portfolios before the reporting dates and these coincide with national calendar dates. C) “Systematic timing of the arrival of good and bad news”. However, recent research focus on the explanations related to the behavioral factors, which will be discussed in the next section.

In the following paragraphs, the IPO anomalies, mainly the underpricing of short-run and the underperformance of long term will be reviewed.

2.4.1 Theoretical explanations of short-run underpricing anomalies

Ritter & Welch (2002) summarize this issue into two basic explanations: theories based on asymmetric information and symmetric information.

In the theories based on asymmetric information, they classified into two situations: 1) if issuer is more informed than investors. Under this situation, the high quality issuers attempt to signal their high quality by deliberate selling their shares at a lower price than the market believes they are worth to distinguish them from the pool of low-quality issuers. However, those issuing companies tend to underpricing IPOs and leave money on the table to create "a good taste in investors' mouths." This is because firms would get compensation in the future issuing. 2) If investors are more informed than the issuer. A number of researches have investigated this situation. And the realistic assumption is the investors are differentially informed. Rock (1986) pointed out the winner' curse theory, which indicates uninformed investors fear that they will receive a full allocation of overpricing IPOs and get comparative lower returns. Faced with the adverse selection, then those investors tend to summit purchase orders only if IPOs are underpriced sufficiently compensate them for the bias in the allocation of new issues. The another result of pricing too high is a negative cascade (Welch 1992), in this theory, the investors just request the shares when the offering is hot and the investors' behaviors will be influenced by other investors, so the issuers have to price the IPO a little lower to make the IPOs oversubscribed. Baron (1982) and Habib & Ljungqvist (2001) offer a different explanation for underpricing from the cost perspective, meaning the underpricing is a necessary cost of going public and also a substitution for expenditure of marketing promotion.

Ritter & Welch (2002) argue that "all theories of underpricing based on asymmetric information share the prediction that underpricing is positively related to the degree of asymmetric information. When the asymmetric information uncertainty approaches zero in these models, underpricing disappears entirely".

In the theories based on symmetric information, two main theories of underpricing exist. One is the law-avoidance explanation, meaning that issuers underprice to reduce their legal liability (Tinic 1988). Another is related to the trading volume in the aftermarket, Boehmer & Fishe (2000) pointed out that trading volume in the aftermarket is higher; the greater is underpricing and then the underwriter gains additional trading revenue.

2.4.2 Theoretical explanations of long-run underperformance anomalies

Based on the study (Ibbotson & Ritter 1995), there are several explanations related to the phenomenon of the long term underperformance of IPOs: 1) The divergence of opinion hypothesis. This theory was first proposed by Miller (1977), he states that investors have heterogeneous briefs about the value of an IPO firm and the most optimistic investors will be the buyers. Over time, as more information is released, the variance of opinions between optimistic and pessimistic investors decrease, and nationally the price will fall. In the following research (Jain & Kini (1994), Field & Hanka (2001) and Brav & Gompers (2002)), they proved this theory exhibit in different countries. 2) The windows of opportunity hypothesis. Ritter (1998) offers that " if there are periods when investors are especially optimistic about the growth potential of companies going public, the large cycles in volume may represent a response by firms attempting to 'time' their IPOs to take advantage of these swings in investor sentiment. " Ritter (1991) also mentioned that the issuers take advantage of "windows of opportunity" in certain years, however, "younger companies and companies going public in heavy volume years did worse than average". Loughran & Ritter (1995) prove evidence that issuers take advantage of "windows of opportunity" where investors are irrational overoptimistic about the value of IPO firms, and related to the low long run performance. Other explanations are including Teoh, Welch & Wong (1998), they pointed out that the low long run performance is related to optimistic accounting early in the life of the firm to induce investors to buy the shares; Heaton (2001), he related the poor long run return with the overoptimistic sentiment of the managers and they tend to overinvest if the funds are available.

2.5 Behavioral finance

In the last section, we discussed the theories of anomalies and several explanations for these phenomena. Furthermore, we try to exploit them from another perspective-behavioral finance.

Behavioral finance has been a hot topic since a couple decades ago and is the most controversial area in finance (Jegadeesh & Titman 1993). Shefrin (2002) briefly define the behavioral finance, he offers "Behavioral finance is the application of psychology to financial behavior-the behavior of practitioners" and categorized three themes of behavior finance: "Heuristic-Driven Bias", "Frame Dependence" and "Inefficient Market". These themes are consistent with the Ritter (2003), he argued that there are two building blocks in behavioral finance, one is cognitive psychology (how people think) and another is the limits to arbitrage (when markets will be inefficient). In the cognitive psychology, several human behavior patterns in finance are considered: such as, Heuristics, or rules of thumb, people follow this to make investments easier but this process usually leads to other errors; Overconfidence; Framing, "the notion that how a concept is presented to individual matters"; Representativeness, this principle was firstly proposed by Daniel Kahneman & Amos Tversky (1972) and refers to "judgments based on stereotype" (Shefrin 2002)); Mental Accounting, "people sometimes separate decisions that should, in principle, be combined." (Ritter 2003); Conservatism, or Anchoring-and-Adjustment, meaning that people stick to the ways things have normally been and may underact when changes happen.

Regarding to the initial public offerings (IPOs), there are three behavior phenomena related: (1) initial underpring, (2) long term underperformance, (3) "hot –issue" market. Shefrin (2002) argued that these three "are indicative of inefficient markets, largely stemming from heuristic-driven bias." And "frame dependence also plays key roles in explaining the three phenomena."

3. DTERMINING THE VALUE OF A STOCK

3.1 Valuation models

In finance theory, the value of stock is determined by the present value of its future cash flows. (Ross, Westerfield & Jaffe 2002). And two kinds of cash flows are provided by the stock: 1) most stocks pay dividends on a regular basis. 2) sell price when the investors sell out the stocks. The general model of the value of the stock is presented as:

(6) $$P_0 = \frac{Div_1}{1+r} + \frac{Div_2}{(1+r)^2} + \frac{Div_3}{(1+r)^3} + \ldots = \sum_{t=1}^{\infty} \frac{Div_t}{(1+r)^t}$$

Div_t is the dividend paid at t year' end, P_0 is the present value of the common stock investment. r is the discount rate of the stock and is greater than the interest rate in the case where the stock is risky.

In practice, the level of expected dividend is growing, fluctuating, or constant. And the general model can be simplified if the firm' dividends are expected to follow some basic patterns: (1) zero growth (2) constant growth (3) differential growth. The summary of dividend-growth models is following: (g is the growth rate.)

(7) Zero growth: $$P_0 = \frac{Div}{r}$$

(8) Constant growth: $$P_0 = \frac{Div}{r-g}$$

(9) Differential growth: $$P_0 = \sum_{t=1}^{T} \frac{Div(1+g_1)^t}{(1+r)^t} + \frac{\frac{Div_{T+1}}{r-g_2}}{(1+r)^T}$$

3.2 Models for determining expected returns

During this section, we will focus on three classic models to determine the expected returns. In the theory of finance, the expected return is the return the investors expect a stock to earn over the next period. And this is just an expectation; the actual return may be either higher or lower (Ross, Westerfield & Jaffe 2002). The three models, CAPM (Capital-Asset-Pricing-Model), APT (Arbitrage pricing Model) and Fama-French three-factor model, will be presented in this section.

3.2.1 Capital Asset Pricing Model (CAPM)

Based on the model of portfolio choice proposed by Harry Markowitz (1959), William Sharp (1964) and John Lintner (1965) developed the capital asset pricing model (CAPM), which marks the birth of asset pricing theory (Fama & French 2004).

The basic theory of the familiar Sharp-Lintner CAPM equation when considering about the risk free borrowing and lending is the expected return on any asset i is the risk-free interest rate R_f, plus a risk premium, which is the asset' market beta, $ß_{iM}$, times the premium per unit of beta risk, $E(R_M)$- R_f. The formula is following:

$$E(R_i) = R_f + ß_{iM} * [E(R_M) - R_f], i=1, 2\ldots N \quad (10)$$

In this equation, $E(R_i)$ is the expected return on asset i, and $ß_{iM}$, the market beta of asset i, is the covariance of its return with the market return divided by the variance of the market return,

$$\text{(Marker Beta) } ß_{iM} = \frac{\text{cov}(R_i, R_M)}{ó^2(R_M)} \quad (11)$$

Fama & French (2004) argued that although more than 40 years passed, the CAPM is still

widely used in applications, such as estimating the cost of capital for firms and evaluating the performance of managed portfolios. And the main reason of the popularity is because "it offers powerful and intuitively pleasing predictions about how to measure risk and the relation between expected return and risk." However, the empirical record of the model is not good, and it cannot be used in application. And many studies have already showed there are many stock returns patterns cannot be explained by the CAPM, such as the stock return is related to its size (ME, the ratio of the book value of common equity to its market value), earnings/price (E/P), cash flow/price (C/P), and past sales growth. (Banz (1978), Reinganum (1980), Rosenberg, Reid & Lanstein (1985), and Lakonishok, Shleifer & Vishny (1994)). These patterns are typically called anomalies. Ross (1976) proposed the arbitrage pricing theory (APT) is an alternative to the simple one-factor CAPM.

3.2.2 Arbitrage pricing theory (APT)

The arbitrage pricing theory (APT) developed primarily by Ross (1976) is a parametric alternative to the simple one-factor CAPM and to some extent APT accounts for the empirical anomalies that arise within the CAMPM. It is a one-period model in which the investors believe that the stochastic properties of return of the capital assets are consistent with a factor structure. And this theory is based on three assumptions (Reinganum 1981). First, the capital markets are perfectly competitive. Secondly, investors always prefer more wealth to less wealth with certainty. And thirdly, the stochastic process generating asset returns can be represented as a k-factor model, the form is following:

$$(12) \qquad \tilde{R}_i = E_i + b_{i1}\tilde{\delta}_1 + \ldots + b_{ik}\tilde{\delta}_k + \tilde{\varepsilon}_i \quad \text{for } i=1,\ldots, N$$

Where:

$\tilde{R}_i$ = return on asset i;

E_i =expected return for asset i;

b_{ik} = reaction in asset i's return to movements in the common factor $\tilde{\delta}_k$

$\tilde{\delta}_k$ = a common factor, with a zero mean, that influences the return on all assets;

$\tilde{\varepsilon}_i$ = an idiosyncratic effect on asset i's return which, by assumption, is completely diversifiable in large portfolios and has a mean of zero;

N= number of assets.

Reinganum (1981) argued that "the economic argument of the APT is a simple one. In equilibrium, the return on a zero-investment, zero-systematic-risk portfolio is zero, as long as the idiosyncratic effects vanish in a large portfolio".

3.2.3 Fama-French three-factor model

Fama & French (1993, 1996) proposed a three-factor model for expected returns based on the firm characteristics. And this formula is following:

$$(13) \qquad E(R_i)-R_f = b_i[E(R_M)-R_f]+s_i E(SMB)+h_i E(HML),$$

In this model, the expected return on a portfolio in excess of the risk-free rate $[E(R_i)-R_f]$ is explained by the sensitivity of its return to three factors: (i) the excess return on a broad market portfolio $(E(R_M)-R_f)$; (ii) the difference between the return on a portfolio of small stocks and the return on a portfolio of large stocks (SME, small minus big); and (iii) the difference between the return on a portfolio of high-book-to-market stocks and the return on a portfolio of low-book-to-market stocks (HML, high minus low), and b_i, s_i, h_i are the factor sensitivities.

And one application of the expected return equation of the three-factor model is that the intercept α_i in the time-series regression, (Fama & French 2004)

$$(14) \quad R_{it} - R_{ft} = \alpha_i + \beta_{iM}(R_{Mt} - R_{ft}) + \beta_{is} SMH_i + \beta_{ih} HML_i + \varepsilon_{it}$$

is zero for all assets i. And according to Fama & French (1993,1996), the three factor model captures much of the variation in average return for portfolios formed on size, book-to-market equity and other prices ratios that cause problems for the CAPM.

Fama & French (2004) offers that the three factor model is now widely used in the empirical research work which requires a model of expected returns. The main applications are: the estimation of α_i is used to calculate the speed about the stock prices responding to new information; the measurement of the fund performance; an alternative way to estimate the cost of equity capital.

3.3 Price/Earnings-Ratio

In academic and practitioner publication, the price-earnings multiple, the ratio of price per share to earnings per share (P/E ratio), is broadly used for evaluating the IPO stock by comparing the comparable company' P/E ratio. The P/E ratio reflects the market' opinion of a firm' potential growth opportunity. The P/E ratio can e.g. be obtained as following: (Bodie et al. 2005:624)

$$(15) \quad \frac{P_0}{E_1} = \frac{1-b}{r - ROE * b}$$

Where P_0 = share price, E_1=earnings, b=percentage of the earnings that are reinvested into the company, r=required rate of return, ROE= return on equity.

From this formula, we can find P/E ratio increases with ROE increases. This is because higher ROE projects give the company good opportunities for growth and if the companies take advantage of these opportunities the market will reward the company with high P/E ratio. However, Bodie et al. (2005) also mentioned two main pitfalls in the

P/E analysis: 1) The accounting earnings in the denominator of the equation (15) are affected by different accounting rules and valuation methods. 2) The use of P/E ratio is related to the business cycle. And P/E ratio in the equation (15) assumes implicitly that earnings rise at a constant rate, however, the reported earnings can fluctuate dramatically around a trend line. Kim & Ritter (1999) found that using P/E to valuate the IPO stocks based on the historical earnings leads to less accurate valuation results compared to that based on the forecasted earnings.

3.4 Pricing of initial public offerings

Establishing a reasonable offering price for the IPO firms is the critical part. However, pricing of IPO is very difficult and so many factors will influence the IPO valuation. Kim & Ritter (1999) mentioned that the first step of pricing the IPO stock is to compare its financial and operational performance with that of a number of public companies in the same industrial sector. As the underwriters, the investments must set the minimum and maximum offering prices according to the market price ratios and the adjustment of the firm-specific information. The price range should balance the conflicting goals of the most important parties: issuers and investors. For issuers, they want the highest price to take full advantages to raise more capitals. But if the stock is overpriced, the risk of a poor after-market performance is increasing and might lead the lawsuits from the investors and also investors will reject the next offering. However, on another side, the investors are willing to pay the lowest price. Underpricing makes the company "leave something on the table" and also damages the investment banker' reputation. The investment bankers not only need to consider about the internal factors: an issuer's historical and projected financial results for pricing of IPOs, but also the valuation for comparable companies and the overall market condition, and the most important factor: the investor' demand for the new issue.

4. HONG KONG EQUITY MARKET

In this chapter, Hong Kong equity markets and the institutional environment will be briefly introduced. Understanding the features of Hong Kong stock markets would help us explain the quantitative results from the empirical study better. The process of public offering, especially from the Hong Kong equity markets perspective will be mentioned including the requirements of public offering. Advantages and disadvantages of public offering will be discussed after that.

4.1 Features of Hong Kong stock markets

Hong Kong, officially the Hong Kong special administration region of the people's republic of China, is one of the two special administration regions. As a gateway to mainland China, she closely links to the mainland China. However, Hong Kong maintains a highly capitalist economy built on a policy of free market, low taxation and government non-intervention. Furthermore, Hong Kong has been developed into an international financial center and trade, with the greatest concentration of corporate headquarters in the Asia-Pacific region.

Hong Kong Stock Exchange (HKSE) was established in 1891. The exchange has predominantly been the main exchange for Hong Kong where shares of listed companies are traded. Right now Hong Kong Exchanges and Clearing is the holding company for the exchange, And so far Hong Kong Stock Exchange ranks fifth in the world by market capitalization of listed companies, with a total market capitalization of over Hong Kong US$ 19.904 trillion at the end September of 2007. (HKSE Statistics 2007, website: http://www.hkex.com.hk/index.htm).

According to the Handbook (Listing in Hong Kong: A quality market, 2007) published by HKSE, some of Hong Kong's advantages as a listing venue are set out below:

(1) Gateway to mainland China

With close trading and business links to the Mainland China, Hong Kong is strategically placed in a high growth region and provides an ideal platform for issuers to achieve exposure in the rapidly growing Mainland market. As an internationally recognized financial centre with an abundance of professional China expertise, the Exchange has provided many Asian and multinational companies a gateway to the Mainland China.

(2) Home market for mainland companies

As Hong Kong is one of the top 10 largest stock markets in the world and part of Mainland China, the market is the first choice for Mainland companies seeking a listing on an overseas international market. The applicability of the "home market" theory is reinforced by the statistic that a significant portion of the trading value of Mainland companies is conducted in Hong Kong where such companies have a dual listing in Hong Kong and another major overseas exchange.

(3) Strong investor demand and fund raising capability

Hong Kong has the ability to attract an impressive investor base from both local and overseas investment communities. This provides issuers a platform with strong fund raising capability during their initial public offerings and post-listing fund raising activities.

(4) Free flow of capital and information

With zero capital flow restriction, simple tax structure, free convertibility of currency and free flow of information, Hong Kong offers an attractive market for both issuers and investors alike.

(5) Strong legal system and international accounting standards

Hong Kong has a well established legal system based on English common law and adopts Hong Kong or International Financial Reporting Standards, which provides a strong and attractive foundation for companies to raise funds as well as confidence to investors.

(6) Sound regulatory framework

The Exchange's Listing Rules are on a par with international standards and demand from listed issuers a high level of disclosure. The Exchange's stringent corporate governance requirements ensure that investors have access to timely and transparent information which allows them to appraise the position and prospects of the companies.

(7) Advanced trading, clearing and settlement Infrastructure

Hong Kong possesses a strong trading, clearing and settlement infrastructure of the securities market which facilitates greater liquidity of the stock market and provides quality services to brokers, investors and other market participants.

4.2 Advantages and Disadvantages of going public

Initial price offering provides an alternative way to raise the huge number of fund for the company to support the continuous operation, strengthen the market shares and customer relationship, and increase the R&D spending in order to find new products or new use of the existing products, and after that to increase the manufacturing capacity to make the products and then distribute those products. (Ross 2003). And in this section, additional advantages as well as some disadvantages will be discussed separately.

4.2.1 Advantages of going public

Referring to the Handbook (Listing in Hong Kong: A quality market) published by HKSE and Ross (2003), there are several benefits for the issuing companies.

(1) Liquidity and valuation

On the public markets, the shareholders can trade the shares of the listing companies, so the investors are willing to pay a premium for liquidity. And the information contained in the subsequent public financial reports reduce the uncertainty around the performance, so compared to the private company, the identical company exist higher value approximately 30 %.

(2) Management and employee motivation

The grant of employee share options or stock bonuses to attract and tie the management and employee is becoming more and more popular since 1990. And the equity-based awards and ownership is more popularly used in the public companies compared to the private companies, and the holders can easily find the results directly from the stock prices changes.

(3) Higher profile and enhanced images

One of the intangible benefits of going public is the increased visibility of the company through its ongoing disclosures to the stock exchange or security commissions. And this higher profile in the market will generate reassurance among the companies' customers and suppliers and finally enhance the company images.

(4) Increased the corporate transparency

This benefit is related to the previous advantage, and the increased company transparency could lead to the grant of credits lines on more competitive terms from the company' bankers.

4.2.2 Disadvantages of going public

Going public have several disadvantages, and in the following section, some main disadvantages of initial price offering will summarized according to the literature.(Sabine 1987:43-44); Ritter (1998:1); Ibbotson, Sindelar & Ritter (1988:37) and Benton (2005).

(1) Time and Costs of IPO

The IPO offering process is time consuming, distracting and expensive. Normally, the actual IPO offering process takes about five to six month, even one year to complete. The cost of IPO offering includes the underwriter fees, the listing fees, the legal fees, accounting fees and miscellaneous fees. For instance, the appendix 1 and 2 show the initial listing fees and the annual listing fees on the main board of Hong Kong Stock Exchange separately. According to the Handbook, the initial listing fees are calculated based on the monetary value of equity securities of the company to be listed and the annual listing fee which is calculated by reference to the nominal value of the securities which are or are to be listed on the Exchange. And as mentioned before, the offering price is usually underpricing, so the dilution of share price is also an indirect cost.

(2) Public companies face ever increasing discloses requirements.

Once going public, the public company is required to disclose a number of information about the business strategy, financial and accounting information and some degrees of prospective analysis and so on. At the same time, the companies have to be cautious on the timing of releasing these reports which can hurt the stock prices.

(3) Loss of founders' control and reduce the operation flexibility.

The founders may lose the control power within the IPO and shareholders have more rights to decide the business strategy. Furthermore, the need of approval by shareholders will slow down the decision-making processes and make the company lose the business

opportunities especially face the fast changing business environment.

(4) Expectations of the short term results.

Analyst and shareholders, especially the individual investors, they monitor the short term performance of the company closely, like quarterly even daily. So if the company' long term planning hurts the short term performance, which will influence the sentiment of the investors, then eventually affects the stock prices.

4.3 The process of public offering in Hong Kong stock markets

4.3.1 General

The procedure for issuing IPOs and listing on the main board of Hong Kong Stock Market is similar to that of many British Commonwealth countries. Issues are normally underwritten and fixed pricing is adopted as opposed to a book building approach. (Carey & Steen 2006).

This section outlines the main process by which companies are brought to market in an initial offering pricing on the main board of Hong Kong Stock Exchange and some specific issues to which we need to pay more attention. And according to Ross et al. (2002), Ellis, Michaely & O'Hara (1999), Handbook by Herbert Smith (2006) and Handbook: Listing in Hong Kong (HKSE 2007), I summarized the steps required to IPO and the related issues.

The first step in the issue of securities to the public is to obtain the approval from the board of directors within the company. Then the company needs to select an investment bank to advise it and perform underwriting functions or public offerings can be managed by several underwriters and one investment bank is selected as the lead manager. And the lead manager plays the major role through the transaction and this type is most common

in the real world. The most commonly used listing method in Hong Kong is an offer for subscription, which is the offer of new securities to the public by the issuer, or by someone on behalf of the issuer. (Cheng, Cheung & Po 2004). Through the contract between the issuer and the underwriters, the role of underwriters can be determined and the underwriters guarantee the issue. The most common type of underwriting arrangement involved with large issues is “firm commitment” underwriting, which means the underwriters subscribes themselves the securities to sell them again to the investors. Once the underwriters have been selected, the main following steps are shown in the figure 5, indicating the listing flowchart to the main board of Hong Kong Stock Exchange. From this chart, we can find out the process of initial pricing offering is complex and combined of tasks by a number of participants. “The completion of the process provides new capital for the firm and a new investment opportunity for the public.” (Ellis et al. 1999)

Following the British company law, the subscribers for IPOs on the main board of Hong Kong stock market are invited to apply for shares when the offer period and the offer price are published in a prospectus and also pay in advance for shares sought in a new issue before they know whether or not they would receive an allocation. And issuing firms and underwriters distribute shares randomly and equally across application orders. So it is uncertain for the applicants to be allocated all the shares they applied for. This means that IPO applicants would face the loss of the opportunity cost of interest income from the application funds. (Leung & Menyah 2006).

If the offer is over-subscribed, the underwriter will be responsible for the share allocation. The HKSE must be satisfied that the share allotment procedure is fair so that applications for the same number of securities receive equal treatment. The share allotment result is published in the newspaper and trading in the shares of the newly listed companies will start on the HKSE shortly afterwards. (Cheng et al. 2004)

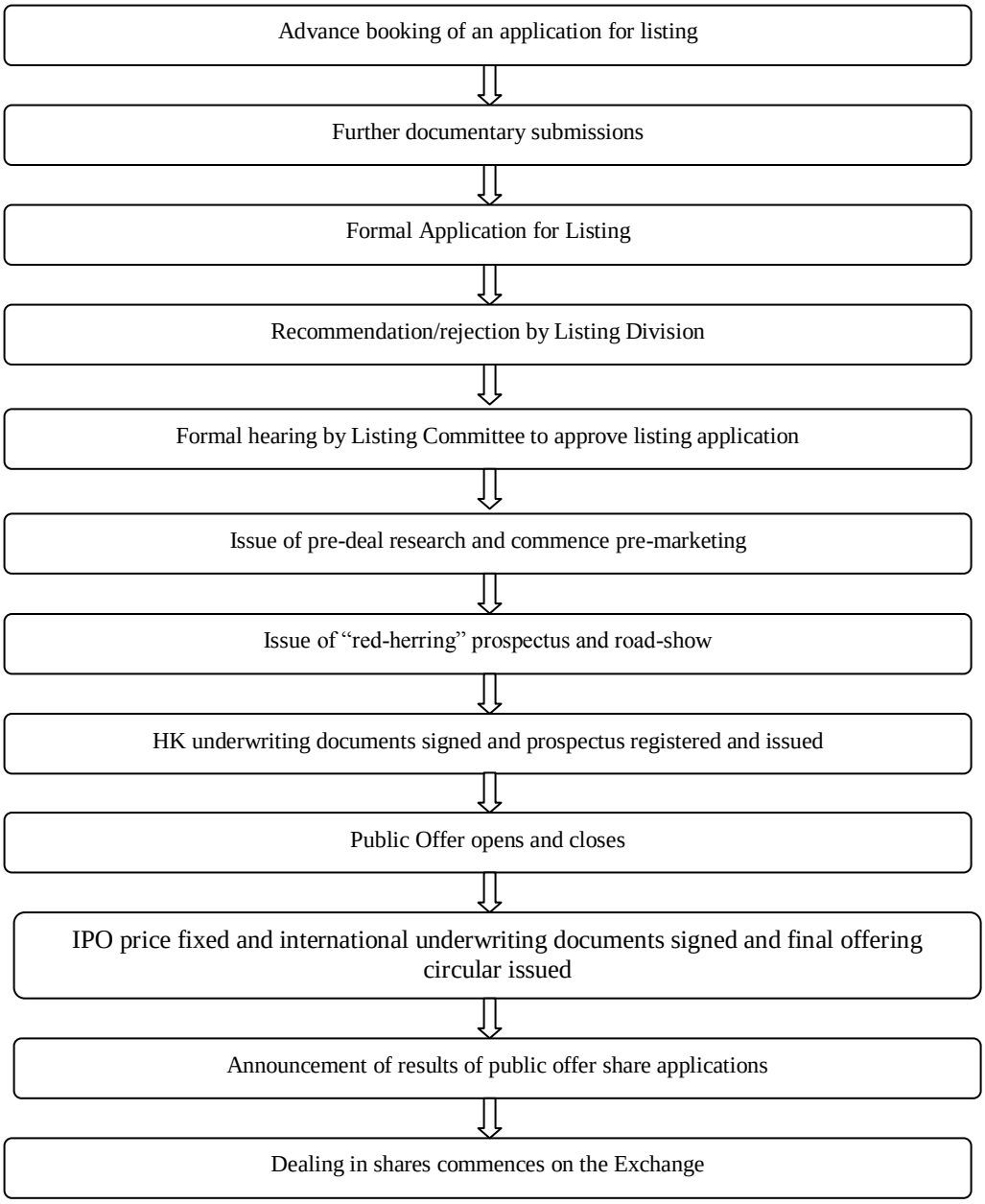

Figure 5. Listing Flowchart for the main board of HKSE.

(Source: Hong Kong Stock Exchange, website: http://www.hkex.com.hk/index.htm)

4.3.2 Requirements of public offering

This section will delineate three main listing requirements of Hong Kong Stock Exchange according to the Handbook: Listing in Hong Kong (HKSE 2007).

(1) Financial requirement: new applicants must fulfill one of three financial criteria showed in the appendix 3.

(2) Management, ownership and control during the track record period: A new applicant must have been under substantially the same management and ownership during the 3-year track record period. In practice, this means that the company has had:

a. Management continuity for at least the 3 preceding years;

b. Ownership continuity and control for at least the most recent audited financial year.

(3) Spread of shareholders:

a. A minimum of 300 holders (if qualifying under the profit test or market capitalization/revenue/cash flow test) or 1,000 holders (if qualifying under the market capitalisation/revenue test)

b. Not more than 50% of the securities in public hands at the time of listing can be beneficially owned by the 3 largest public shareholders.

5. DATE DESCRIPTION AND METHODOLOGY

In this chapter, the data and the methodology used in this study will be introduced. The main objective of this chapter is to explain why and how the abnormal returns are measured by the different approaches.

5.1 Data Description

Data used for the calculation of initial returns performance and long term performance of IPOs is described in this section. The sample for calculating the initial returns includes 176 IPO companies during the years 2000 to 2004. And sample for calculating the long term performance is comprised of 188 initial public offerings during the same sample period. The sample number for calculation the initial returns is less than that for the calculation of long term performance is because: some IPO companies are upgraded from GEM (Hong Kong Growth Enterprise Market, the secondary board of Hong Kong Stock Market; website: http://www.hkgem.com) to the main board of Hong Kong Stock Exchange, therefore there are no offering price for those companies.

The sample for the calculation of the long term performance includes 188 initial public offerings in 2000-2004, and represented 82.1% of the total number of the firms going public and 98.18% of the total amount of new equity raised in those years. Data on the issuing details is obtained from the website of HKSE; stock returns of each IPO companies and the market index returns come from two sources: Thompson Financial Services (DataStream) and Yahoo Finance. A total of 41 IPOs were excluded from the sample because of either: (i) being delisted due to mergers or acquisitions during the sample period. (ii) being bankrupt during the 36 months aftermarket. (iii) missing data from the Database for up to three years after listing. Table 3 presents the distribution of the sample for the long term performance calculation by year, both in terms of the number of offers and the gross proceeds. Inspection of table 3 shows that the number and the capitalization raised of IPOs were not evenly distributed over the 2000-20004 sample

period. Only 21 of the 188 sample offers occurred during the year 2001. However, the number of IPOs in year 2002 is twice than that in 2001. The overall real gross proceeds raised by the 188 IPOs over the period time were approximately 329,773 Million Hong Kong Dollars. And thirty-five percent (HK$ 115,766 million of the HK$ 329,773 million total) of the aggregate gross proceeds in the sample was raised in 2000 alone.

Figure 6 describes the number of the H-share IPOs and non H-share IPOs in the sample period for the long term performance calculation. During the five-year period, 27 H-share IPOs were listed on the main board of the Hong Kong Stock Exchange. This number is same for both short-run performance and long term performance calculation. And in the second half of the sample period, more Chinese mainland enterprises have chosen Hong Kong Stock Exchange as the target oversea public market.

The Hang Seng index is chosen as the market benchmark in this study. And it is a free-float capitalization-weighted index of selection of companies from the Stock Exchange of Hong Kong, and it is the main indicator of the overall market performance in Hong Kong consisting 43 big companies. (http://www.hsi.com.hk/).

Table 3. Distribution of Initial Public Offering (for long term performance calculation) by Year, 2000-2004.

		Total of 229 offers		188 offers in sample		Total included
Year	No. of IPOs	Aggregate gross proceeds HK$ Millions	No.of IPOs	Aggregate gross proceeds HK$ Millions	No.of IPOs (%)	Aggregate gross proceeds (%)
2000	43	117,407.00	30	115,766.00	69.77	98.60
2001	31	21,599.00	21	19,986.00	67.74	92.53
2002	60	45,185.00	51	44,316.00	85.00	98.08
2003	46	57,226.00	43	57,141.00	93.48	99.85
2004	49	94,465.00	43	92,564.00	87.76	97.99
Total	229	335,882.00	188	329,773.00	82.10	98.18

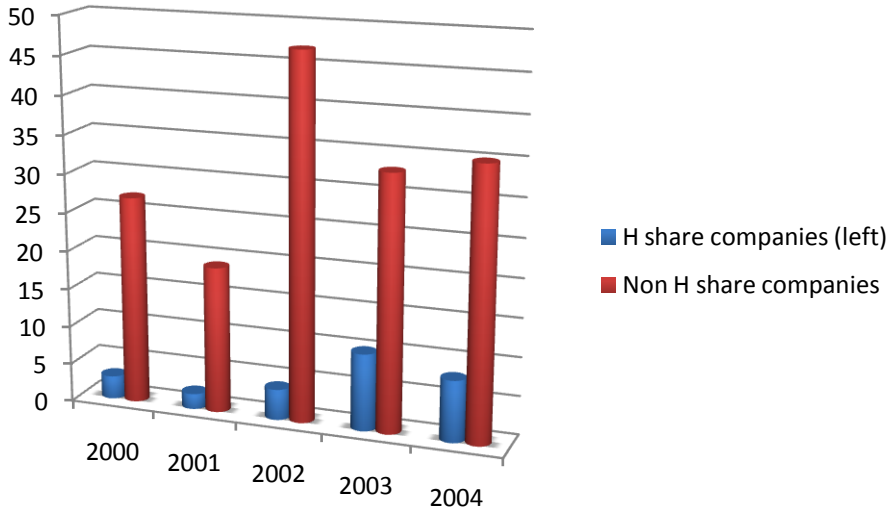

Figure 6. Distribution of Initial Public Offering in the sample for two groups: H-share IPOs and non H-share IPOs, 2000-2004.

5.2 Methodology

The approaches to investigate the aftermarket performance of initial offering returns are mainly followed with the methodology used in the papers Agarwal, Liu & Rhee (2006), Ritter (1991), Levis (1993) and Chan et al (2007). Following the previous research, the returns are calculated for two intervals: 1) The initial return period, covers the first day of trading, i.e., it related the first closing price to the offering price of an issue. 2) After market period, defined as the 3 years after the IPO exclusive of the initial return period. The initial return period is defined to be month 0, and the aftermarket period includes the following 36 months where event months are defined as successive 21-trading-day periods relative to the IPO date.

5.2.1 IPO initial raw returns (IR_i)

In order to measure the initial returns on the first trading day, the following formula to calculate the initial raw returns is used:

(16) $$IR_i = \frac{P_i - S_i}{S_i}$$

Where, for IPO firm i, P_i is the closing price on the first trading day and S_i is the subscription price. If the result from the equation (16) is positive, then the IPO is considered as underpriced.

5.2.2 Cumulative average adjusted returns (CARs)

To study the long term dynamics of IPOs, the cumulative average abnormal returns is used, as suggested Ritter (1991). The first step of CAR in this study is to calculate monthly benchmark-adjusted returns as the monthly raw return on an IPO stock (r_{it}) minus the benchmark returns (r_{mt}), so the first day adjusted return (ar_i) for issue i is defined as the percentage change in price from the offering date to the close at the first day of trading(r_i) less the equivalent change in an appropriate benchmark(r_m).

(17) $$ar_i = r_i - r_m$$

And then the benchmark adjusted return for stock i in event month t is defined as;

(18) $$ar_{it} = r_{it} - r_{mt}$$

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

(19) $$AR_T = \frac{1}{n}\sum_{i=1}^{n} ar_{it}$$

Then cumulative benchmark-adjusted aftermarket performance from event month q to event month s is the summation of the average equally-weighted benchmark-adjusted return:

(20) $$\text{CAR}_{q,s} = \sum_{t=q}^{s} AR_T$$

To test the statistically significance of abnormal returns for initial public offerings, Student's t-test is used. The t-statistics for the average adjusted return is computed for each month as $\text{AR}_T * \sqrt{N_t}$ /sd_t, where AR_T is the average market-adjusted return for each month t, N_T is the number of observations in month t, and sd_t is the cross-sectional standard deviation of the adjusted returns for month t.

The t-statistic for the cumulative average adjusted return in month t, $\text{CAR}_{1,t}$, is computed as:

(21) $$\text{t (CAR)} = \frac{CAR_{I,t} * \sqrt{N_t}}{\sqrt{t * \text{var} + 2(t-1) * \text{cov}}}$$

Where N_T is the number of observations in month t, and t is the event month, var is the average (over 36 months) cross-sectional variance, and cov is the first-order autocovariance of the AR_t series.

5.2.3 Buy-and-Hold abnormal returns (BHARs)

In this section, we will investigate the impact on investors' wealth if the same amount of money is invested passively in each IPO after the first day of trading compared with the buy-and-hold returns achieved by investing in the benchmark using windows over 1-day, 3-days, and 1-month, 3-month, 6-month, 1-year, 2-year and 3-year periods. So the formula to calculate the *T* period buy-and-hold abnormal return (BHAR) as the difference between the holding-period returns of IPO *i* and the benchmark return is following:

(22) $$\text{BHAR}_{i,T} = \prod_{t=1}^{T}(1 + R_{I,t}) - \prod_{t=1}^{T}(1 + R_{B,t})$$

Where $R_{i,t}$ denotes the rate of return (including dividends and all other financial benefits stockholders receive) on stock *i* in month *t* after its IPO, and $R_{B,t}$ is the corresponding benchmark return. The mean buy-and-hold abnormal return is computed as the arithmetic average of abnormal returns on all IPOs in the sample of size *N*:

(23) $$\text{BHAR}_{IPO,T} = \frac{1}{N}\sum_{i=1}^{N} BHAR_{i,T}$$

A t-statistic is calculated based on the standard deviation of all firms' abnormal returns for an event window. T-statistics is adopted to test for the level of significance on the abnormal returns calculated by BHARs based on the market index. The conventional t-statistic is defined as:

(24) $$t_{BHAR} = \frac{BHAR_P}{\sigma_{\text{BHAR}_p} / \sqrt{n}}$$

Where BHAR_p is the sample average and σ_{BHAR_p} is the sample standard deviation of the BHARs of n firms. A negative (positive) value of BHAR indicates that IPOs underperform (outperform) a portfolio of benchmarks

In this study the systematic risk was not explicitly adjusted when measuring the monthly abnormal returns. However, as mentioned in the paper (Levis 1993), the assumption of a positive market risk that beta equals to 1 does not affect the essence of the results and provide conservative estimates of IPOs' underperformance.

6. EMPIRICAL RESULTS

This chapter presents the results of analyses of the performance of IPOs on the main board Hong Kong Stock Exchange in the three years following listing and the five hypotheses will be tested one by one.

6.1 Initial performance of IPOs

H_1: Initial public offerings are underpriced on the Hong Kong main board

The first hypothesis tests whether the Hong Kong main board IPOs is underpriced based on the initial raw return and initial market adjusted return methodologies. The first day initial return is defined as the difference between the IPO' first day closing price and the offer price divided by the offer price and initial market adjusted return is calculated based on the Buy-and-hold methodology.

6.1.1 Initial raw returns

In the figure 7, the average initial raw return in this study is -6.7% during the sample period with an associated t-statistics of 3.26. The kurtosis of the distribution is 10.76 and the histogram is positively skewed, thus there are some extremely high negative returns and the mass distribution of initial raw returns is concentrated on the left side of coordinate origin. This phenomenon can also be proved also in the figure 8, which shows the most of initial raw returns of the 176 companies are negative. The initial raw returns of 104 companies in total sample 176 companies are negative, however, there has still been a significant chances to gain profits in the first trading day since 37 percent of initial raw returns are positive.

Table 4 presents the results of initial raw returns by year. We can see that the initial raw returns are significantly negative in the years 2000 and 2001 (-20% and -10%) with an associated t-statistics of 3.31 and 2.18 separately. And one interesting phenomenon in year 2002 is the extremely high kurtosis with a value of 15.14. This is partially due to the extremely high initial raw return of the company, Hon Po Group (Lobster King) Limited, which gain 155% return during the first listing day.

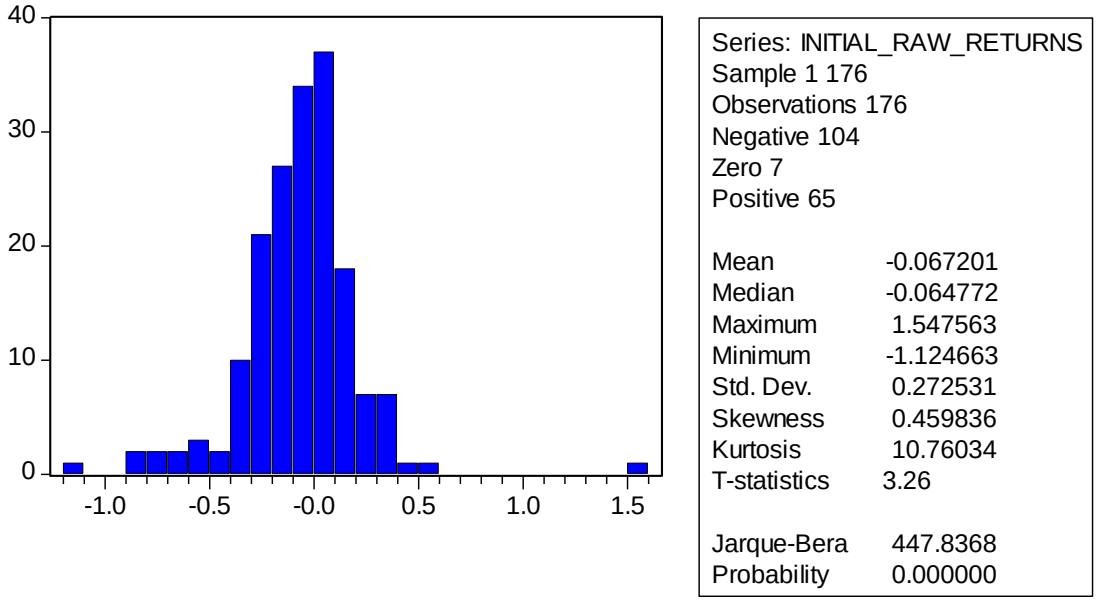

Figure 7. Histogram of All Initial Returns.

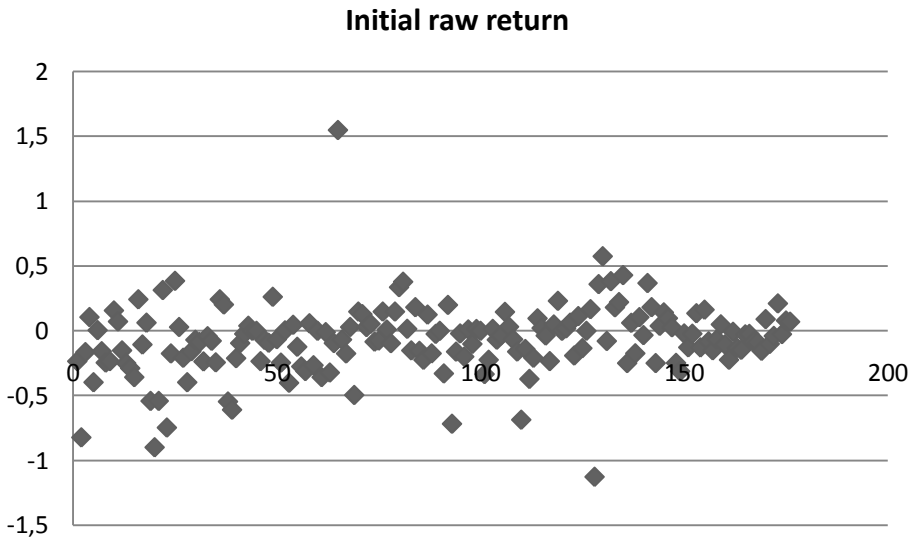

Figure 8. The distribution of the initial raw returns for the 176 companies.

Table 4. The distribution of the initial raw returns by year.

	2000	2001	2002	2003	2004
Mean	-0.2	-0.1	-0.04	-0.03	-0.03
Median	-0.19	-0.08	-0.06	0	-0.03
Maximum	0.39	0.26	1.55	0.57	0.37
Minimum	-0.9	-0.61	-0.72	-1.12	-0.31
Std.Dev	0.32	0.21	0.32	0.3	0.14
Skewness	-0.34	-0.6	2.53	-1.3	0.33
Kurtosis	2.77	3.68	15.14	7.1	3.05
t-statistics	-3.31**	-2.18*	-0.86	-0.62	-1.37

** 1 percent level of statistical significance
* 5 percent level of statistical significance

6.1.2 Market adjusted initial returns

Table 5 presents the results from the equally weighted average initial returns based on the methodology of buy-and-hold abnormal returns (BHARs) for the sample companies that went public during the period 2000 to 2004, using the market index as benchmark. Column one shows the results for all the sample companies and from column two to six,

the results of market adjusted returns in each year are presented. The main finding is that there is no evidence of underpricing in the initial public offering (IPO) stocks listed on the Hong Kong main board when using the market index benchmark. The average adjusted initial return is -7.36% with t-statistics -3.57. And the initial returns in year 2000 are the significantly lowest comparing to those in other sample years.

Table 5. Market adjusted initial returns of IPOs.

	All	2000	2001	2002	2003	2004
Mean	-0.07	-0.23	-0.09	-0.04	-0.03	-0.04
Median	-0.07	-0.2	-0.08	-0.07	-0.01	-0.04
S.D	0.27	0.31	0.2	0.31	0.29	0.31
T-statistics	-3.57**	-3.84**	-2.14	-0.95	-0.64	-0.73

** 1 percent level of statistical significance
* 5 percent level of statistical significance

6.1.3 Conclusion of the initial performance of IPOs

Based on both of the initial raw returns and initial market adjusted returns, the underpricing phenomenon does not exist on the main board of Hong Kong stock market during the years 2000 to 2004. And the initial returns are significantly negative in the years 2000 and 2001. Hong Kong main board IPOs were overpriced on average. These findings are in contract to those documented in the study (Loughran et al. 2006) where underprcing phenomenon is reported.

This result is consistent with the Aggarwal, Leal & Hernandez (1996) found even during the “hot issue” season, there still exists the negative initial returns. And another explanation is that after the collapse of the Dot-Com boom during the year of 2000, investors had less enthusiasm to put their money in the IPO stocks even though the IPO firms on the main board are large, long established and sound. And the issuing firms overestimated the market sentiment for their firms’ values. As a result, this led to the poor initial return of the IPO stocks compared to the overall market. So we reject the second

hypothesis in this study.

6.2 The long term performance of IPOs

In this section, the second hypothesis of long term performance of IPOs on the main board of Hong Kong Stock Exchange is studied based on the cumulative average market adjusted returns and buy-and-hold abnormal returns methodologies.

H_2 : Post-IPO stocks underperform in the long-run on the Hong Kong Main Board

6.2.1 Cumulative average market adjusted returns

Table 6 reports the average market index-adjusted returns (AR_T) and cumulative average market index-adjusted returns ($CAR_{q,s}$) for the 36 months after the offering date for 188 IPOs in 2000-2004. Column 4 reports the CARs calculated by equally-weighting, with the associated *t* statistics in Column 5. It is evident that all the 36 monthly average adjusted returns are negative, with 29 of them having t-statistics lower than -2.00. The negative average adjusted returns are reflected in a steady decline in the cumulative average adjusted returns, from -1.73% in the month 1 to -71.59% by the end of the month 36, exclusive of the initial return, with an associated t-statistic of -9.28. Based on the equally-weighted CAR measure of long-run performance, the results of this study are in agreement with the results from the US reported by Ritter (1991), Loughran and Ritter (1995), the UK results reported by Levis (1993) and Hong Kong results from Chan et al. (2007). So the underperformance of the IPOs is both economically and statistically significant.

Table 6. Abnormal Return for Initial Public Offerings in 2000-2004.

Month of seasoning	AR_t(%)	t-stat	$CAR_{i,t}$(%)	t-statistics
M1	-1.73	-1.25	-1.73	-1.36
M2	1.17	1.04	-0.56	-0.31
M3	-1.16	-1.07	-1.72	-0.77
M4	-2.00	-1.72	-3.72	-1.45
M5	-2.10	-1.92	-5.82	-2.03*
M6	-0.47	-0.42	-6.30	-2.00*
M7	4.16	2.07*	-2.14	-0.63
M8	-1.91	-1.45	-4.05	-1.11
M9	-3.29	-1.94	-7.34	-1.90
M10	-2.93	-2.67**	-10.27	-2.53**
M11	-2.11	-1.96	-12.38	-2.90**
M12	-0.78	-0.66	-13.16	-2.96**
M13	0.28	0.22	-12.88	-2.78**
M14	-1.50	-1.10	-14.38	-2.99**
M15	-4.21	-2.82**	-18.59	-3.73**
M16	-2.24	-1.83	-20.83	-4.05**
M17	-2.01	-1.90	-22.85	-4.31**
M18	-0.87	-0.89	-23.72	-4.35**
M19	-3.61	-2.54*	-27.33	-4.88**
M20	-1.34	-1.22	-28.67	-4.99**
M21	-2.77	-2.35*	-31.44	-5.34**
M22	-5.58	-4.00**	-37.02	-6.14**
M23	-4.67	-2.70**	-41.69	-6.76**
M24	-1.22	-1.17	-42.91	-6.81**
M25	-2.69	-2.51*	-45.60	-7.09**
M26	-3.38	-2.71**	-48.99	-7.47**
M27	-1.30	-1.10	-50.29	-7.53**
M28	-1.68	-1.59	-51.97	-7.64**
M29	-3.58	-2.67**	-55.55	-8.02**
M30	-1.00	-0.93	-56.55	-8.03**
M31	-2.82	-2.08*	-59.37	-8.29**
M32	-4.03	-3.00**	-63.40	-8.72**
M33	-2.30	-1.93	-65.71	-8.90**
M34	-3.45	-2.79**	-69.16	-9.22**
M35	-2.11	-1.86	-71.27	-9.37**
M36	-0.33	-0.26	-71.59	-9.28**

Average market benchmark based on the market index adjusting returns (AR_t) and cumulative average returns ($CAR_{1,t}$), with associated t-statistics for the 36 months after going public, excluding the initial return. $AR_T = \frac{1}{n}\sum_{i=1}^{n} ar_{it}$, and $ar_{it} = r_{it} - r_{mt}$, ar_{it} is the benchmark adjusted return for stock i in event month t. The t-statistics for the average adjusted return is computed for each month as $AR_T * \sqrt{N_t} / sd_t$, where AR_T is the average market-adjusted return for each month t, N_T is the number of observations in month t, and sd_t is the cross-sectional standard deviation of the adjusted returns for month t. The t-statistic

for the cumulative average adjusted return in month t, $CAR_{1,t}$, is computed as $CAR_{1,t} * \sqrt{N_t}$ /csd $_t$, where N_T is the number of observations in month t, and csd $_t$ is computed as csd $_t$ = [t*var+2*(t-1)*cov] $^{1/2}$, where t is the event month, var is the average(over 36 months) cross-sectional variance, and cov is the first-order autocovariance of the AR_t series.

** 1 percent level of statistical significance
* 5 percent level of statistical significance

6.2.2 Buy-and-Hold abnormal returns

Table 7 presents the results from the equally weighted mean one-, two- and three-year buy-and-hold abnormal returns (BHARs) for the sample companies that went public during the period 2000 to 2004, using the market index as benchmark. For investors who purchase the IPO stocks through the initial public offerings and sell the stocks in the last day after 36 month later, they would lose almost 40% on average. And the abnormal returns are more severe in the long horizons. The underperformance is statistically significant 1-3 years after the IPO. The 1-year, 2-year and 3-year BHARs are -9 percent, -29 percent and -40 percent with t-statistics –2.17, -5.09 and -4.66, respectively. The results show suggest that there is evidence of long term underperformance for the IPOs on the Hong Kong main board which is consistent with earlier research.

Table 7. The BHARs of Initial Public Offerings in 2000-2004.

	Median	Mean	S.D	T-statistics
1-Month	-0.04	-0.02	0.19	-1.81
3-Month	-0.06	-0.02	0.31	-0.89
6-Month	-0.06	-0.05	0.41	-1.81
1-Year	-0.11	-0.09	0.58	-2.17*
2-Year	-0.38	-0.29	0.79	-5.09**
3-Year	-1.02	-0.40	1.17	-4.66**

** 1 percent level of statistical significance
* 5 percent level of statistical significance

6.2.3 Conclusion of long term performance of IPOs

Using two methodologies to test the long term performance of IPOs on the main board of Hong Kong Stock Exchange, we clearly accept the second hypothesis. Furthermore, comparing the return performance results based on CAR method and BHARs methods, we can find the underperformance of Hong Kong IPOs is much higher when CAR returns are used. This means that the BHARs method imparts an upward bias in the long term. This result is contrary to the expectation, which is the buy-and-hold return method can magnify underperformance, even if it occurs in only a single period (Fama (1998), Mitchell & Stafford (2000) and Gompers & Lerner (2003)).

6.3 The performance comparison between H-share IPOs and non H-share IPOs

The third and forth hypothesis shed light on the performance comparison between the H-share companies and non H-share companies from the initial return and long term aspects.

H_3: The performance of average initial returns is better with H-share stocks than non H-share stocks

H_4: The average long-run performance is better with H-share stocks than non H-share stocks

6.3.1 Buy-and-Hold Abnormal Returns

The main finding of Table 8 is that for the H-share IPO companies, the initial returns are higher than non H-share companies (-2% versus -8%). And in the three years anniversaries, the H-share companies outperform the overall market. However, the long term underperformance is statistically significant within the non H-share IPOs. The

BHARs are -9% for the first year, -32% for the two years and -47% for the three holding years with t-statistics -2.1, -5.37 and 5.75 individually.

Table 8. BHARs of Initial Public Offering stocks spits the samples based on H-shares and Non H-shares.

	Initial returns	3-days	1-month	3-month	6-month	1-year	2-year	3-year
Panel A: H-share companies								
median	-0.05	-0.03	-0.01	0.00	-0.05	-0.08	-0.13	-0.22
Mean	-0.02	-0.02	0.01	0.03	-0.06	-0.09	-0.15	0.05
S.D	0.22	0.23	0.13	0.23	0.30	0.46	0.64	1.33
T-Statistics	-0.58	-0.37	0.37	0.72	-0.98	-1.02	-1.20	0.20
Panel B: Non H-share companies								
median	-0.07	-0.08	-0.04	-0.08	-0.07	-0.12	-0.46	-0.73
Mean	-0.08	-0.08	-0.03	-0.03	-0.05	-0.09	-0.32	-0.47
S.D	0.28	0.29	0.20	0.33	0.43	0.59	0.81	1.13
T-Statistics	-3.89**	-3.60**	-2.13*	-1.23	-1.73	-2.10*	-5.37**	-5.75**

** 1 percent level of statistical significance
* 5 percent level of statistical significance

6.3.2 Cumulative average adjusted returns

To test the two hypotheses, the cumulative average adjusted returns methodology (CARs) will be also adopted. The main finding of Table 9 confirms the previous result: the performance of H-share after the initial public offering is better than the non H-share companies. In the third year period, the non H-share companies underperform 82% with the t statistics -8.99.

Figure 9 plots the market index adjusted cumulative average returns based on the three groups where the initial returns are excluded: 1) all the sample companies, 2) H-share companies, 3) Non H-share companies. As the figure shows, while all the groups show display the negative long term performance, the H-share companies still perform much

better than the non H-share IPOs.

Table 9. The cumulative average adjusted returns of initial public offerings split into two groups: H-shares and Non H-shares in year 2000-2004.

Month	$CAR_{i,t}$ (H-share companies)	t-statistics	$CAR_{i,t}$ (Non H-share companies)	t-statistics
M1	0.00	-0.20	-0.02	-1.30
M2	0.02	0.49	-0.01	-0.30
M3	-0.01	-0.14	-0.02	-0.74
M4	-0.05	-0.99	-0.04	-1.39
M5	-0.09	-1.65	-0.06	-1.95
M6	-0.09	-1.60	-0.06	-1.92
M7	-0.08	-1.31	-0.01	-0.60
M8	-0.12	-1.76	-0.03	-1.07
M9	-0.13	-1.84	-0.07	-1.83
M10	-0.16	-2.14*	-0.09	-2.42*
M11	-0.19	-2.34*	-0.11	-2.79**
M12	-0.18	-2.12*	-0.13	-2.84**
M13	-0.17	-1.91	-0.13	-2.67**
M14	-0.13	-1.49	-0.15	-2.87**
M15	-0.14	-1.50	-0.20	-3.58**
M16	-0.12	-1.25	-0.22	-3.89**
M17	-0.18	-1.77	-0.24	-4.14**
M18	-0.18	-1.73	-0.25	-4.17**
M19	-0.21	-1.99	-0.28	-4.68**
M20	-0.19	-1.74	-0.30	-4.78**
M21	-0.16	-1.44	-0.34	-5.12**
M22	-0.17	-1.55	-0.40	-5.89**
M23	-0.19	-1.64	-0.45	-6.49**
M24	-0.18	-1.53	-0.47	-6.53**
M25	-0.16	-1.33	-0.50	-6.80**
M26	-0.14	-1.13	-0.54	-7.17**
M27	-0.08	-0.60	-0.57	-7.22**
M28	-0.03	-0.27	-0.60	-7.33**
M29	-0.05	-0.36	-0.64	-7.70**
M30	-0.03	-0.21	-0.65	-7.70**
M31	-0.05	-0.39	-0.68	-7.95**
M32	-0.06	-0.41	-0.73	-8.36**
M33	-0.02	-0.16	-0.76	-8.53**
M34	-0.01	-0.07	-0.80	-8.85**
M35	-0.02	-0.15	-0.82	-8.99**
M36	-0.03	-0.23	-0.82	-8.90**

** and * represent significance at 1% and 5% respectively.

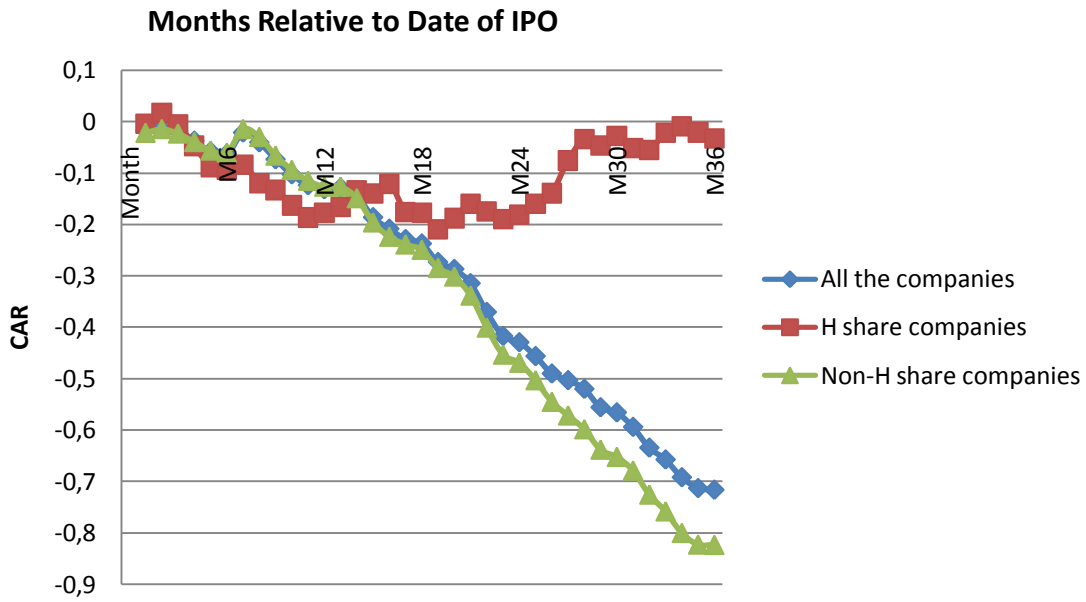

Figure 9. Cumulative average market index adjusted returns for an equally-weighted portfolio of 188 initial public offerings in 2000-2004. Three series are plotted for the 36 months after the IPOs date: 1) all the sample companies, 2) H-share companies, 3) Non H -share companies.

6.3.3 Conclusion of performance comparison between H-share IPOs and non H-share IPOs

Based on the Buy-and-hold returns and Cumulative adjusted returns methodologies, we can find the both initial returns and long term performance are better within the H-share companies than non H-share companies. So we clearly accept the third and fourth hypothesis.

6.4 The comparison of IPOs performance between high issue season and low issue season

The fifth hypothesis is relative to the theory of “window of opportunity” in the initial

public offerings based on the Buy-and-Hold abnormal returns methodology.

H_5: Low long-run return for the stocks issued in the high volume period of IPOs

From table 10 to table 14, the five tables report the performance of equally-weighted mean three-year BHARs for Hong Kong IPO companies listed during the years 2000 to 2004, categorized by the year of listing. The poor long term abnormal performance statistically significantly occurred for IPOs taking place in the years 2002 and 2003 with the number of IPOs 51 and 43 separately. However, the long run underperformances occurring for IPOs taking place in the year 2000, 2001 and 2004 were not statistically significant. The negative relation between annual volume and aftermarket performance is evident, for instance, in the tables 11, 12 and 13. For example, the volume of new issues was double heavier in year 2003 than in 2001, and the three year holding market adjusted returns were significantly poorer for those IPOs issued in year 2003 than in 2001. The results are consisting with the finding of Loughran & Ritter (1995), they found that high underperformance existed in 'hot issue' periods. And also confirms the results from Ritter (1991), he argues that this phenomenon reflects during some period of time, the investors are eager to pay high price for the initial public offering stocks because they were irrationally overoptimistic for the perspective of the growth opportunities and the firms timely choose to go public. As showed in the first chapter, the economic growth of Hong Kong was recovered from the year of 2002, so the investors were overoptimistic about the IPO companies and willing to pay high price for those stocks. These behaviors would lead to the poor long term performance of those IPO stocks. So we accept the fifth hypothesis in this study.

Table 10. BHARs of Initial Public Offering stocks in year of 2000 (IPOs: 30).

	Median	Mean	S.D	T-Stat
Initial returns	-0.20	-0.23	0.31	-3.84**
3-days	-0.19	-0.16	0.35	-2.36*
1-month	-0.10	-0.08	0.22	-1.98
3-month	-0.12	-0.04	0.38	-0.63
6-month	-0.11	-0.07	0.43	-0.90
1-year	-0.07	0.00	0.48	0.01
2-year	-0.03	0.00	0.61	0.04
3-year	-0.12	-0.07	0.60	-0.67

** 1 percent level of statistical significance
* 5 percent level of statistical significance

Table 11. BHARs of Initial Public Offering stocks in year of 2001 (IPOs : 21).

	Median	Mean	S.D	T-Stat
Initial returns	-0.08	-0.09	0.20	-2.14*
3-days	-0.09	-0.03	0.30	-0.53
1-month	-0.07	-0.05	0.15	-1.42
3-month	-0.01	0.10	0.42	1.07
6-month	0.03	0.21	0.61	1.61
1-year	-0.07	-0.03	0.64	-0.18
2-year	-0.43	-0.22	0.74	-1.37
3-year	-0.66	-0.39	1.07	-1.66

** 1 percent level of statistical significance
* 5 percent level of statistical significance

Table 12. BHARs of Initial Public Offering stocks in year of 2002 (IPOs: 51).

	Median	Mean	S.D	T-Stat
Initial returns	-0.07	-0.04	0.31	-0.95
3-days	-0.08	-0.07	0.29	-1.53
1-month	-0.01	0.01	0.22	0.42
3-month	-0.01	0.00	0.27	0.00
6-month	-0.03	-0.04	0.34	-0.94
1-year	0.02	0.01	0.61	0.15
2-year	-0.54	-0.43	0.70	-4.39**
3-year	-0.84	-0.61	0.97	-4.44**

** 1 percent level of statistical significance
* 5 percent level of statistical significance

Table 13. BHARs of Initial Public Offering stocks in year of 2003 (IPOs: 43).

	Median	Mean	S.D	T-Stat
Initial returns	-0.01	-0.03	0.29	-0.64
3-days	-0.05	-0.05	0.30	-1.15
1-month	-0.03	-0.02	0.17	-0.88
3-month	-0.12	-0.10	0.31	-2.08*
6-month	-0.24	-0.17	0.43	-2.66*
1-year	-0.26	-0.33	0.56	-3.85**
2-year	-0.62	-0.58	0.82	-4.63**
3-year	-0.84	-0.70	1.21	-3.80**

** 1 percent level of statistical significance
* 5 percent level of statistical significance

Table 14. BHARs of Initial Public Offering stocks in year of 2004 (IPOs: 43).

	Median	Mean	S.D	T-Stat
Initial returns	-0.04	-0.04	0.31	-0.73
3-days	-0.04	-0.05	0.35	-0.83
1-month	-0.03	-0.02	0.22	-0.62
3-month	-0.03	-0.01	0.38	-0.17
6-month	-0.04	-0.07	0.43	-1.01
1-year	-0.11	-0.07	0.48	-1.03
2-year	-0.19	-0.08	12.48	-0.04
3-year	-0.55	-0.09	24.48	-0.02

** 1 percent level of statistical significance
* 5 percent level of statistical significance

7. SUMMARY AND CONCLUSIONS

This paper investigated the stock return performance of the IPO stocks which are listed on the main board of Hong Kong Stock Exchange during the years 2000 to 2004 based on the cumulative average adjusted returns (CARs) and buy-and-hold returns (BAHRs) methodologies.

For a sample of firms going public between the period January 2000 to November 2004, for an investor who subscribed to the IPO stocks and sold the stocks on the first-trading day, the average market adjusted initial returns was -7.36 percent. As a result of the above, underpricing phenomenon is not observed on the main board of Hong Kong stock market during that period of time. The Hong Kong main board IPO stocks were overpriced on average. This result appears to be the major difference between the short-run behavior of the main board Hong Kong IPOs and previous international evidence. This phenomenon may be explained by the effect of the collapse of the Dot-Com boom from the year 2000. This indicates that investors had less enthusiasm to put their money in the IPO stocks even though the IPO firms on the main board were large, long established and sound. At the same time, during the less enthusiasm by investors, the issuing firms still overestimated the market sentiment for their firms' values. As a result, this led to the poor initial return of the IPO stocks.

During the years 2000 to 2004, an investor who invested in IPOs at the end of the first day of public trading and held them for 3 years would gain almost 72% and 40% less based on the cumulative market adjusted average return methodology and the hold-and-buy methodology respectively than investing in the Hang Seng index with the same amount of money. This result confirms the long term underperformance of IPOs in the previous studies. (see e.g. Ritter (1998), Cheng et al. (2004) & Chan (2007))

Furthermore, compared the return performance results based on CARs method and BHARs methods, the underperformance of Hong Kong IPOs is much higher when CARs returns are used. This means that the BHARs method imparts an upward bias in the long-

run. This result is contrary to the expectation, which is the buy-and-hold return method can magnify underperformance, even if it occurs in only a single period (Fama (1998), Mitchell & Stafford (2000) and Gompers & Lerner (2003)).

By splitting the samples based on the H-share IPOs and non H-share IPOs, poor aftermarket performance exists in both groups. While the performance is comparatively better in the H-share group than in the non H-share group. This result can be derived from the stronger economic growth rate on the mainland China than in Hong Kong from the beginning of last decade of 20th century.

When investigating the aftermarket performance categorized by the year of issuance, we find poorer long term performance associated with the heavy volume of IPO in certain years and this result proves that the issuing firms are taking advantage of "windows of opportunity".

Further research should be conducted focusing on the aftermarket performance based on the matching firms and the intra-day data to investigate the microstructure effects of IPOs.

8. APPENDIX

Appendix 1. Initial Listing Fees (Handbook: Listing In Hong Kong).

Monetary Value of Equity Securities to be listed (HK$ Million)	Initial Listing Fee(HK$)
Not exceeding 100	150,000
200	175,000
300	200,000
400	225,000
500	250,000
750	300,000
1,000	350,000
1,500	4000,000
2,000	450,000
2,500	500,000
3,000	550,000
4,000	600,000
5,000	600,000
Over 5,000	650,000

Appendix 2. Annual Listing Fees (Handbook: Listing In Hong Kong).

Nominal Value of Listing Equity Securities (HK$ Million)	Annual Listing Fee (HK$)
Not exceeding 200	145,000
300	172,000
400	198,000
500	224,000
750	290,000
1,000	356,000
1,500	449,000
2,000	541,000
2,500	634,000
3,000	726,000
4,000	898,000
5,000	1,069,000
Over 5,000	1,188,000

Appendix 3. Main financial requirement for listing on the Main Board of Hong Kong Stock Exchange.

	1. Profit Test	2. Market Cap/ Revenue Test	3. Market Cap/ Revenue/Cashflow Test
Profit Attributable to Shareholders	Profits of HK$50 million in the last 3 years (with HK$20 million in the most recent year and an aggregate of HK$30 million in the two preceding years)	N/A	N/A
Market Cap	At least HK$200 million at the time of listing	At least HK$4 billion at the time of listing	At least HK$4 billion at the time of listing
Revenue	N/A	At least HK$500 million for the most recent audited financial year	At least HK$500 million for the most recent audited financial year
Cash flow	N/A	N/A	Positive cashflow from operating activities of at least HK$100 million in aggregate for the three preceding financial years

Appendix 4. Data sample used in this study.

IPO YEAR	STOCK CODE	COMPANY NAME
2000	768	UBA Investments Ltd
2000	692	Ching Hing (Holdings) Ltd
2000	694	Beijing Capital International Airport Co Ltd - H Shares
2000	969	Hua Lien International (Holding) Co Ltd
2000	997	Decca Holdings Ltd
2000	643	Carry Wealth Holdings Ltd
2000	866	Sunday Communications Ltd
2000	857	PetroChina Co Ltd - H Share
2000	751	Skyworth Digital Holdings Ltd
2000	927	Fujikon Industrial Holdings Ltd
2000	599	E. Bon Holdings Ltd
2000	686	Gay Giano International Group Ltd
2000	859	Zida Computer Technologies Ltd
2000	762	China Unicom Ltd
2000	388	Hong Kong Exchanges and Clearing Ltd
2000	966	China Insurance International Holdings Co Ltd
2000	111	Hantec Investment Holdings Ltd
2000	7	Karl Thomson Holdings Ltd
2000	188	SW Kingsway Capital Holdings Ltd
2000	66	MTR Corporation Ltd
2000	365	Sun East Technology (Holdings) Ltd
2000	335	Upbest Group Ltd
2000	386	China Petroleum & Chemical Corporation - H Shares
2000	162	I-Wood International Holdings Ltd
2000	627	U-RIGHT International Holdings Ltd
2000	192	Saint Honore Holdings Ltd
2000	678	Star Cruises Ltd
2000	1100	Mainland Headwear Holdings Ltd
2000	682	Chaoda Modern Argiculture (Holdings) Ltd
2000	274	Global Green Tech Group Ltd
2000	361	Sino Golf Holdings Ltd
2001	39	Wealthmark International (Holdings) Ltd
2001	696	Travelsky Technology Ltd
2001	809	Global Bio-chem Technology Group Co Ltd
2001	1213	Mobicon Group Ltd
2001	329	Golden Dragon Group (Holdings) Ltd

2001	861	Digital China Holdings Ltd
2001	889	Datronix Holdings Ltd
2001	888	RoadShow Holdings Ltd
2001	885	Forefront International Holdings Ltd
2001	9	Mandarin Entertainment (Holdings) Ltd
2001	1228	Tak Shun Technology Group ltd
2001	931	Artel Solutions Group Holdings Ltd
2001	909	Zhongda International Holdings Ltd
2001	248	HKC International Holdings Ltd
2001	690	New Spring Holdings Ltd
2001	629	Yue Da Holdings Ltd
2001	197	Heng Tai Consumables Group Ltd
2001	2668	Pak Tak International Ltd
2001	739	Zhekiang Glass Co Ltd- H Shares
2001	2600	Aluminium Corporation of China Ltd- H Shares
2001	100	Clear Media Ltd
2002	896	Hanison Construction Holdings Ltd
2002	1073	China Agrotech Holdings Ltd
2002	746	Lee & Man Handbag International Ltd
2002	1129	Sky Hawk computer Group Holdings Ltd
2002	812	Tanrich Financial Holdings Ltd
2002	1126	Dream International Ltd
2002	1002	V.S. International Group Ltd
2002	1076	First National Foods Holdings Ltd
2002	130	Moiselle International Holdings Ltd
2002	228	Hon Po Group (Lobster King) Ltd
2002	209	Sewco International Holdings Ltd
2002	1161	Water Oasis Group Ltd
2002	916	Fu Cheong International Holdings Ltd
2002	157	Natural Beauty Bio-Technology Ltd
2002	646	Yardway Group Ltd
2002	1186	Value Partners China Greenchip Fund Ltd
2002	223	Kenfair International (Holdings) Ltd
2002	2389	Wang Sing International Holdings Group Ltd
2002	928	Tack Fat Group International Ltd
2002	582	Greenfield Chemical Holdings Ltd
2002	856	VST Holdings Ltd
2002	915	Linmark Group Ltd
2002	1198	Chitaly Holdings Ltd
2002	766	Sino Prosper Holdings Ltd
2002	2688	Xinao Gas Holdings Ltd

2002	169	China Fair Land Holdings Ltd
2002	64	Get Nice Holdings Ltd
2002	356	Incutech Investments Ltd
2002	2323	Topsearch International (Holdings) Ltd
2002	1094	Sunny Global Holdings Ltd
2002	628	Teem Foundation Group Ltd
2002	2388	BOC Hong Kong (Holdings) Ltd
2002	1211	BYD Co Ltd - H Shares
2002	1217	Sino Technology Investments Co Ltd
2002	364	Huafeng Environmental Protection Group Ltd
2002	860	Ming Fung Jewellery Group Ltd
2002	2898	Long Far Pharmaceutical Holdings Ltd
2002	912	Suga International Holdings Ltd
2002	1227	First Asia Capital Investment Ltd
2002	395	Asia Zirconium Ltd
2002	2888	Standard Chartered PLC
2002	221	LeRoi Holdings Ltd
2002	1142	Rontex International Holdings Ltd
2002	2309	Grandtop International Holdings Ltd
2002	850	Wing Shing Chemical Holdings Ltd
2002	379	PME Group Ltd
2002	728	China Telecom Corporation Ltd - H Shares
2002	357	Hainan Meilan Airport Co Ltd - H Shares
2002	2883	China Oilfield Services Ltd - H Shares
2002	587	Hua Han Bio-Pharmaceutical Holdings Ltd
2002	607	Warderly International Holdings Ltd
2003	2302	United Metals Holdings Ltd
2003	1195	Sinotronics Holdings Ltd
2003	2330	Techwayson Holdings Ltd
2003	1178	Vitop Bioenergy Holdings Ltd
2003	598	Sinotrans Ltd - H Shares
2003	2326	BEP International Holdings Ltd
2003	2336	Sunlink International Holdings Ltd
2003	264	Chanco International Group Ltd
2003	1140	Concepta Investments Ltd
2003	2322	Sam Woo Holdings Ltd
2003	2868	Beijing Capital Land Ltd - H Shares
2003	2349	Wah Yuen Holdings Ltd
2003	2317	Vedan International (Holdings) Ltd
2003	980	Lianhua Supermarket Holdings Co., Ltd - H Shares
2003	2355	Baoye Group Co Ltd - H Shares

2003	2882	Ocean Grand Chemicals Holdings Ltd
2003	572	Spread Prospects Holdings Ltd
2003	2310	Kwang Sung Electronics HK Co Ltd
2003	387	Leeport (Holdings) Ltd
2003	2348	Dawnrays Pharmaceutical (Holdings) Ltd
2003	2342	Comba Telecom Systems Holdings Ltd
2003	653	Bonjour Holdings Ltd
2003	309	Lo's Enviro-pro Holdings Ltd
2003	1164	Vital BioTech Holdings Ltd
2003	737	Hopewell Highway Infrastructure Ltd
2003	2368	Eagle Nice (International) Holdings Ltd
2003	565	Art Textile Technology International Co Ltd
2003	2320	Hop Fung Group Holdings Ltd
2003	2698	Weiqiao Textile Co Ltd - H Shares
2003	2314	Lee & Man Paper Manufacturing Ltd
2003	2340	Synergis Holdings Ltd
2003	2339	Norstar Founders Group Ltd
2003	2327	Jiwa Bio-Pharm Holdings Ltd
2003	2324	China Northern Enterprises Investment Fund Ltd
2003	2357	AviChina Industry & Technology Co Ltd - H Shares
2003	589	Ports Design Ltd
2003	2328	PICC Property and Casualty Co Ltd - H Shares
2003	836	China Resources Power Holdings Co Ltd
2003	1149	Broad Intelligence Pharmaceutical Holdings Ltd
2003	699	Chia Hsin Cement Greater China Holding Corporation
2003	2333	Great Wall Automobile Company Ltd- H Shares
2003	2628	China Life Insurance Company Ltd- H Shares
2003	2899	Fujian Zijin Mining Industry Co Ltd - H Shares
2004	904	China Green Holdings Ltd
2004	110	Fortune Telecom Holdings Ltd
2004	2337	Shanghai Forte Land Co Ltd - H Shares
2004	581	China Oriental Group Co Ltd
2004	2341	EcoGreen Fine Chemicals Group Ltd
2004	2338	Weichai Power Co Ltd - H Shares
2004	981	Semiconductor Manufacturing International Co Ltd
2004	2300	Vision Grande Group Holdings Ltd
2004	1160	Grand Investment International Ltd
2004	2878	Solomon Systech (International) Ltd
2004	77	AMS Public Transport Holdings Ltd
2004	2633	Nam Tai Electronic & Electrical Products Ltd
2004	2319	China Mengniu Dairy Co Ltd

2004	2866	China Shipping Container Lines Co Ltd - H Shares
2004	700	Tencent Holdings Ltd
2004	1116	Mayer Holdings Ltd
2004	2318	Ping An Insurance Co. of China, Ltd - H Shares
2004	2331	Li Ning Company Ltd
2004	2356	Dah Sing Banking Group Ltd
2004	2366	Qin Jia Yuan Media Services Co Ltd
2004	2343	Pacific Basin Shipping Ltd
2004	733	Hopefluent Group Holdings Ltd
2004	311	Luen Thai Holdings Ltd
2004	2358	Mitsumaru East Kit (Holdings) Ltd
2004	2383	TOM Group Ltd
2004	597	CSMC Technologies Corporation
2004	2379	Zhongtian International Ltd
2004	2307	Kam Hing International Holdings Ltd
2004	2618	TCL Communication Technology Holdings Ltd
2004	1194	China Force Oil & Grains Industrial Holdings Co., Ltd
2004	745	Wing Hong (Holdings) Ltd
2004	2380	China Power International Development Ltd
2004	2332	Hutchison Telecommunications International Ltd
2004	929	IPE Group Ltd
2004	906	China Netcom Group Co. (Hong Kong) Limited
2004	2371	ZZNode Holdings Company Limited
2004	2877	China Shineway Pharmaceutical Group Limited
2004	2387	Integrated Distribution Services Group Limited
2004	2369	China Wireless Technologies Limited
2004	2678	Texhong Textile Group Limited
2004	763	ZTE Corporation - H Shares
2004	753	Air China Limited - H Shares
2004	1175	FU JI Food and Catering Services Holdings Limited
2004	438	IRICO Group Electronics Company Limited - H Shares
2004	1000	Beijing Media Corporation Limited - H Shares
2004	319	China Metal International Holdings Inc

9. REFERENCES

Ahmad-Zaluki, N. A., K. Campbell & A. Goodacre (2007). The Long Run Share Price Performance of Malaysian Initial Public Offerings (IPOs). Journal of Business Finance & Accounting. 34:1, 78–110.

Agarwal, S., C. Liu & S. G., Rhee (2006). Investor demand for IPOs and aftermarket performance: Evidence from the Hong Kong stock market. Journal of International Financial Markets, Institutions & Money. Doi:10.1016/j.intfin.2006.09.001.

Aggarwal, R., R. Leal & L. Hernandez (1993). The aftermarket performance of initial public offerings in Latin America. Financial Management. 22, 42-53.

Bachelier, L. (1990). Theory of speculation. Ph.D. Disseration In: The Random Charater of Stock Market Price. Ed.P. Cootner. Massachusett: MIT Press.17-78.

Banz, R. W. (1978). Limited Diversification and Market Equilibrium. An Empirical Analysis. Ph.D. Dissertation. Chicago: University of Chicago.

Baron, D. (1982). A model of the demand for investment banking advising and distribution services for new issues. Journal of Finance. 37: 4, 955-976.

Benton, G. L. 2005. The Advantages and Disadvantages of Going Public. Available online from the World Wide Web: <http://www.google.com/search?sourceid=ie7&q=Advantages+and+Disadvantages+of+Going+Public+Gary+Benton%3A+2005&client=pub-0194889602661524>

Bodie, Z., A. Kane & A. J. Marcus (2005). Investments. 6. ed. New York: McGraw-Hill Companies Inc.

Boehmer, E. & R. P. H. Fishe (2000). Do underwriters encourage stock flipping? A new explanation for the underpricing of IPOs. Unpublished working paper. University of Miami.

Brav, A. & P. Gompers (2003). The role of lock-ups in initial public offerings. Review of Financial Studies. 16, 1-29.

Carey, P. & A. Steen (2006). Changing conditions in the Hong Kong new issues market. Pacific-Basin Finance Journal. 14, 484–500.

Chan, P.T., F. Moshirian, D. Ng & E.Wu (2007). The underperformance of the growth enterprise market in Hong Kong. Research in International Business and Finance. 21, 428–446.

Cheng, W.Y., Y. Cheung & K. Po (2004). A note on the intraday patterns of initial public offerings: evidence from Hong Kong. Journal of Business Finance and Accounting. 31, 5-7.

Cheng, W. Y., Y. Cheung & Y. C. Tse (2006). The Impact on IPO Performance of More Stringent Listing Rules with a Pre-listing Earnings Requirement: Evidence from Hong Kong. Journal of Business Finance & Accounting. 33:5, 868–884.

Copeland, T. E., J. F. Weston & K. Shastri (2005). Financial Theory and Corporate Policy. 4. ed. New York: Pearson Addision Wesley. 353-354p.ISBN 0321127218.

Dewenter, K. L. & C.F. Field (2001). Investment bank reputation and relaxed listing requirements: evidence from infrastructure firm IPOs in Hong Kong. Journal of Pacific Basin Finance. 9, 101–117.

Drobert, W., M. Kammermann & U. Walchli (2005). Long run performance of initial public offering: the evidence for Switzerland. Schmalenbach Bueiness Review.

57, 253-275.

Ellis, K., R. Michaely & M. O'Hara (1999). A Guide to the Initial Public Offering Process. Available from the World Wide Web:
< http://forum.johnson.cornell.edu/faculty/michaely/Guide.pdf>

Espenlaub, S., A. Gregory & I. Tonks (1998). Testing the Robustness of Long-Term Under-Performance of UK Initial Public Offerings, Discussion Paper in Business and Management. 07.

Fama, E. F. (1970). Efficient Capital Markets: a Review of Theory and Empirical Work. Journal of Finance. 25:3, 383-417.

Fama, E. F. (1991). Efficient Capital Markets: II. Journal of Finance. 46:5, 1575–1617.

Fama, E.F. (1998). Market Efficiency, Long-Term Returns, and Behavioral Finance. Journal of Financial Economics. 49:3, 283–306.

Fama, E. F. & K. French (1993). Common Risk Factors in the Returns on Stocks and Bonds. Journal of Financial Economics. 33:1, 3–56.

Fama, E. F. & K. French (1996). Multifactor Explanations of Asset Pricing Anomalies. Journal of Finance. 51:1, 55–84.

Fama, E. F. & K. French (2004). The CAPM: Theory and evidence. Working paper.

Field, L. & H. Gordon (2001). The Expiration of IPO Share Lockups. Journal of Finance. 56:1, 471-500.

Gompers, P. A. & J. Lerner (2003). The Really Long-Run Performance of Initial Public Offerings: The Pre-Nasdaq Evidence. Journal of Finance. 58:4, 1355–92.

Habib, M. & A. Ljungqvist (2001). Underpricing and entrepreneurial wealth losses in IPOs: Theory and evidence. Review of Financial Studies. 14, 433-458.

Heaton, J. B. (2001). Managerial optimism and corporate finance. Unpublished Bartlet Beck working paper. Chicago IL.

Ibbotson, R. (1975). Price Performance of Common Stock New Issues. Journal of Financial Economics. 2:3, 235–272.

Ibbotson, R., J. L. Sindelar & J. Ritter (1988). Initial Public Offerings. Journal of Applied Corporate Finance. 1:2, 37–45.

Jain, B. & O. Kini (1994). The post-issue operating performance of IPO firms. Journal of Finance. 49:1, 1699-1726.

Jegadeesh, N. & S. Titman (1993). Returns to buying winners and selling losers: implications for stock market efficiency. Journal of Finance. 48:65−91.

Kahneman,D. & A. Tversky (1972). Subjective probability: A judgment of representativeness. Cognitive Psychology. 3, 430-454.

Kauppi, M. & T. Martikainen (1994). Trading Strategies Based on Stock Market Anomalies on the Helsinki Stock Exchange. In: Tutkimuksia No 179. Vaasa: University of Vaasa.

Keloharju, M. (1993). Winner's curse, legal liability, and the long-run performance of initial public offerings in Finland. Journal of Financial Economics. 34, 251-277.

Khurshed, A., R.Mudambi & M. Goergen (1999). On the long Run Performance of IPOs. Discussion paper, University of Reading.

Kim, M. & J. Ritter (1999). Valuing IPOs. Journal of Financial Economics. 53, 409-437.

Lakonishok, J., A. Shleifer & R. Vishny (1994) Contrarian Investment, Extrapolation, and Risk. Journal of Finance. 49:1541–78.

Lee, P., S. Taylor & T. Walter (1996). Australian IPO underpricing in the short and long-run. Journal of Banking and Finance. 20: 1189-1210.

Leung, J. & K.Menyah (2006). Issuer-oriented underpricing costs in initial public offers: Evidence from Hong Kong. Journal of Corporate Finance. 12, 897– 905.

Levis, M. (1993).The Long-Run Performance of Initial Public Offerings: The UK Experience 1980-1988.Financial Management. 22:1, 28-41.

Lintner, J. (1965). The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. Review of Economics & Statistics. 47:1, 13-37.

Listing in Hong Kong (online). Published by Hong Kong Stock Exchange, updated until 12.11.2007. Available online from the World Wide Web: <:http://www.hkex.com.hk/issuer/listhk/Booklet.htm>

Ljungqvist, A. (1997). Pricing initial public offering: Further evidence from Germany. European Economic Review. 41:1309-1320.

Loughran, T. & J. Ritter (1993). The timing and subsequent performance of IPOs of new issues, unpublished working paper (University of Illinois).

Loughran, T. & J. Ritter (1995). The new issues puzzle. Journal of Finance. 50, 23–51.

Loughran, T., J. Ritter & K. Rydqvist (2006). Initial Public Offerings: International

Insights. Pacific-Basin Finance Journal. (Published in 1994. 2, 165-199. Updated January 26, 2006).

Markowitz, H. (1959). Portfolio Selection: Efficient Diversification of Investments. John Wiley & Sons, New Jersey.

McGuinness, P. (1992). An examination of the underpricing of initial public offerings in Hong Kong: 1980–1990. Journal of Business Finance and Accounting. 19:2, 165–186.

Miller, E. (1977). Risk, Uncertainty, and Divergence Option. Journal of Finance. 32:4, 1151–1168.

Mills, T. (1999). The Econometric Modelling of Financial Time Series. 2ed. Cambridge University Press. 123p. ISBN 0521-62413-4.

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

Reinganum, M. R. (1981). Misspecification of Capital Asset Pricing: Empirical Anomalies Based on Earnings Yields and Market Values. Journal of Financial Economics. 9:1, 19–46.

Ritter, J. (1991). The Long-Run Performance of Initial Public Offerings. Journal of Finance. 46:1, 3–27.

Ritter, J. (1998). Initial Public Offerings. Contemporary Finance Digest. 2:1, 5-30.

Ritter, J. (2003). Behavioral Finance. Pacific-Basin Finance Journal. 11:429-437.

Ritter, J. & I. Welch (2002). A Review of IPO Activity, Pricing, and Allocations. Journal

of Finance. 57:4, 1795-1828.

Rock, K. (1986). Why New Issues Are Underpriced? Journal of Financial Economics. 15:1–2, 187–212.

Rosenberg, B., K. Reid & R. Lanstein (1985). Persuasive Evidence of Market Inefficiency. Journal of Portfolio Management. 9, 18–28.

Ross, H. G. (2003). IPOs and Equity Offerings.1.ed.Butterworth-Heinemann Inc.

Ross, S. A. (1976). The Arbitrage Theory of Capital Asset Pricing. Journal of Economic Theory. 13:3, 341–360.

Ross, S. A., R. W. Westerfield & F. Jaffe (2002). Corporate Finance. 6.ed. New York: McGraw-Hill Companies Inc. ISBN: 7-111-10491-9.

Sabine, M. (1987). Corporate Finance. Going Public and Issuing New Equity and Take overs, Mergers and Disposals. London: Butterworths.

Shapiro, A. C. (1991). Modern Corporate Finance. *The Journal of Finance*. 46:2, 789-793.

Sharp, W. (1964). Capital Asset Prices - A Theory of Market Equilibrium Under Conditions of Risk. Journal of Finance. September 1964, 425-442.

Shefrin, H. (2002). Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing. New York: Oxford University Press Inc.

Shiller,R., J. (2003). From Efficient Markets Theory to Behavioral Finance. Journal of Economic Perspectives. 17, 83–104.

Smith, H. (2006). Hong Kong IPO Guide. Available from World Wide Web:

<:http://www.herbertsmith.com/NR/rdonlyres/A51BF7E8-CAB9-4989-9053-692AF21DAB20/2887/HKIPOGuidefinal.PDF>

Teoh, S. H., I. Welch & T. J. Wong (1998). Earnings Management and the Long-Run Performance of Initial Public Offerings. Journal of Finance. 53:6, 1935–1974.

Thaler, R. (1987). Anomalies: Seasonal Movements in Security Prices II: Weekend, Holiday, Turn of the Month, and Intraday Effects. The Journal of Economic Perspectives. 1:2, 169-177.

Tinic, S. (1988). Anatomy Of initial public offerings of common stock. Journal of Finance. 43, 789-822.

Welch, I. (1992). Sequential Sales, Learning, and Cascades. Journal of Finance. 47:2, 695–732.