PRE-MARKET DECISIONS AND LONG-RUN PRICE PERFORMANCE OF INITIAL PUBLIC OFFERINGS IN NYSE AND NASDAQ

By

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Declaration

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Abstract

The amount of capital raised from the initial public offerings (IPO) market has tripled in the past 10 years (EY Global Limited, 2013; Renaissance, 2014). Aftermarket performance of these stocks largely depends on the investor perceptions about the quality of the new issues, which are signaled by the pre-market decisions, and the availability of investable resources. The study investigated the influence of pre-market decisions including share price related decisions, financial and operational maturity related questions and underwriter selection decisions on the long-run price performance of 607 NYSE and NASDAQ IPOs in the pre- and post-2008 global financial crisis environment. Using a longitudinal quantitative design, it also analyzed the impact of 2008 global financial crisis to the initial, short-run and long-run price performance of IPOs.

The study documented the influence of share price, offer rate, market capitalization, company age, profitability and auditor selection on the long-run price performance at varying magnitudes and directions. Also, the research exhibited the impact of the 2008 financial crisis on the relationship between pre-market factors, including stock exchange decision, company age and profitability; and aftermarket price performance of IPOs. The study showed that the price performance of IPOs in the data set increased over the investment horizon, which opposes the majority of studies in the literature. However, this outlook changed after the financial crisis, as the post-crisis period reported positive initial and short-run price performance, and negative long-run price performance, which is in line with the literature. Therefore, the researcher argued that the 2008 financial crisis corrects the aberrations in the pre-crisis IPO market.

The findings of the research presented original conclusions for the impact of the financial crisis on the IPO markets to the body of knowledge. Additionally, the research provided IPO market analysis from the financial crisis period for the pre-market decision-making processes of IPO-issuing companies, underwriters, investors, auditors, and market researchers.

Keywords: initial public offerings, long-run performance, financial crisis, underwriter decisions,

List of Abbreviations and Symbols

CAR	Cumulative average return
CMAAR	Cumulative market-adjusted average return
EDGAR	Electronic Data Gathering, Analysis and Retrieval System
FYE	Fiscal year end
IPO	Initial public offering
MAAR	Market-adjusted average return
NASDAQ	National Association of Securities Dealers Automated Quotations
NPM	Net profit margin
NYSE	New York Stock Exchange
OLS	Ordinary least squares method
P/E	Price to earnings ratio
SEC	United States Securities and Exchange Commission

Glossary

Auditor	An independent firm that reviews the financial statements of the company.
Cumulative average return (CAR)	Average aftermarket price performance of a stock calculated for a specified duration of time.
Cumulative market adjusted abnormal return (CMAAR)	Aftermarket price performance of a stock with respect to a market benchmark, which is measured for a specified duration of time.
Equally-weighted market index	Aggregate price of the stocks in the market that is calculated with the arithmetic average of the stocks.
Fiscal year end (FYE)	Date of the last day that the company includes in their annual financial statement.
Initial public offerings (IPO)	The first sale process of a private company's common stock to the general public through a stock exchange. Also referred to as new issue stock.
Market adjusted abnormal return (MAAR)	Aftermarket price performance of a stock with respect to a market benchmark.
Market capitalization	Market's total valuation of the company in dollar terms. Also referred to as firm size.
Net profit margin (NPM)	The rate of net income of the company with respect to its revenue.

Offer rate	The percentage of shares offered by the company in the IPO with respect to shares outstanding.
Ordinary least squares method (OLS)	A linear regression estimation method that is commonly used in econometric analysis of market data.
Penny stock	The new issue stocks offered below $5, which are subject to separate regulations of the Securities and Exchange Commission.
Price-to-earnings ratio (P/E)	Amount of money that investors are willing to pay for each dollar of a company's net income per share.
Underwriter	A financial facilitator, which identifies the value of shares and handles the initial public offering sale transactions.
Value-weighted market index	Aggregate price of the stocks in the market that is calculated according to the value of the stocks.

Chapter 1 – Introduction

Initial public offerings (IPOs) are the first sale processes of a private company's common stock to the general public through a stock exchange. One of the primary reasons for private companies to offer their stocks to the public is to raise capital to expand their operations. Also, the shareholders' willingness to convert their ownership into cash is another major reason for companies to issue public shares (Ritter & Welch, 2002). In developed economies, IPOs are considered an instant and low-cost source of capital when compared to private financing such as collateralized loans and venture capital (Chemmanur, He & Nandy, 2010). Additionally, IPOs are the ultimate step of the startup financing cycle.

In 2013, 222 companies raised over $54 billion through IPOs in the US equity markets, which marked the best year for IPOs in over a decade (Renaissance, 2014). Average proceeds per deal were $247 million, which emphasizes the involvement of medium sized companies in the stock exchanges. Globally, 864 companies realized proceeds of $163 billion through IPO deals in 2013 (EY Global Limited, 2013). Last year, the global IPO market managed to increase the number of deals by 3% and proceeds by 27%. IPO proceeds in the US equity markets have shown a similar growth rate, and market analysts (EY Global Limited, 2013; Renaissance, 2014) expected these rates to remain attractive in the near future.

Following the IPO, the companies are listed on a stock exchange for market trade. All of the 222 American companies that went public in 2013 chose to be listed on either the New York Stock Exchange (NYSE) or National Association of Securities Dealers Automated Quotations Stock Market (NASDAQ) (EY Global Limited, 2013). As of

September 2014, the NYSE was the world's largest stock exchange with over $16 trillion of total market capitalization and the NYSE Composite Index lists over 1,850 companies (NYSE Euronext, 2014). NYSE was established in 1792 and it generally includes more established companies including banks, energy and commodity trading companies, automotive firms and conglomerates. NASDAQ is a relatively new stock exchange that was launched in 1971 and it mostly lists more growth focused, younger and innovative companies from information technologies, biotechnology and pharmaceutical sectors. As of August 2014, NASDAQ was the second largest stock exchange in the world by market capitalization. The NASDAQ Composite Index lists over 2,600 securities with a total market capitalization over $6 trillion (World Federation of Exchanges, 2014).

In the US market, IPO processes usually involve one or more investment banks as the underwriter, which identifies the value of shares and handles the sale transactions (Bochner & Avina, 2010). In the European markets, underwriters generally hold an auction to discover share price and to create market demand (Roosenboom, 2012). The aftermarket price performance of a stock is determined by the market demand for the shares. Various pre-market management decisions in the IPO process impact the market demand and subsequently, the aftermarket price performance (Bochner & Avina, 2010).

The investors, which constitute the market demand, perceive the pre-market decisions as signals about the quality of the IPO. The clarity of these signals decreases the level of uncertainty associated with the newly issued stock. (Clarkson, 1994) Also, the investor perceptions about the quality of the stock, as communicated by the decision signals, make up the market demand when combined with the level of available investable resources. This relationship is depicted in Figure 1-1.

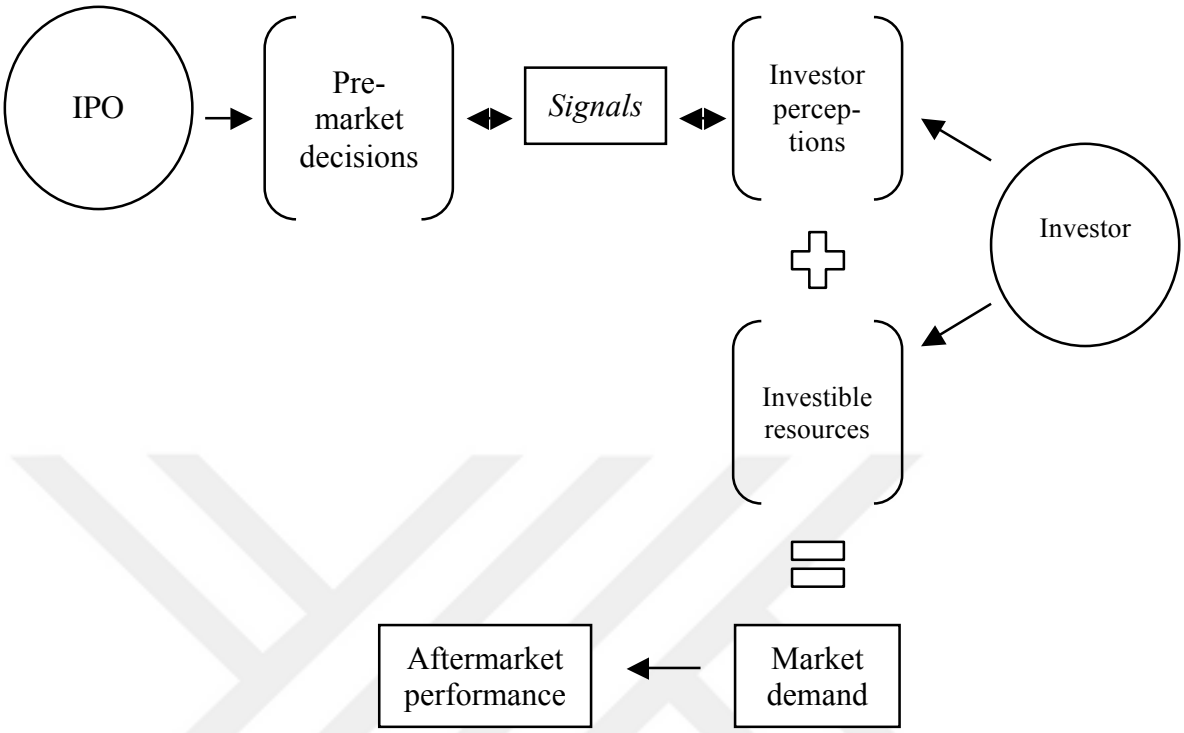

Figure 1-1. The relationship between pre-market decisions and aftermarket performance.

The first and foremost pre-market decision signal about the IPO is its price. The valuation and pricing process for the new issue stocks involves three steps. In the first step, the underwriter collaborates with an independent auditor and the issuing company to come up with a fair value estimate by using several financial methods, namely dividend discount model, discounted cash flow and economic value added. At this stage of the valuation process, company analysts' and independent analysts' assessments are also taken into consideration. Following a deliberate price discount, in the second step the underwriter and the issuer agree upon a preliminary price in an attempt to observe the demand during investor presentations. Depending on the perceived level of demand, the final offer price is determined in the last step before going public (Roosenboom, 2012). In this valuation phase, underwriters typically aim to limit subjectivity, while trying to set a price point that is favorable to both the investors and the issuing company.

In the IPO process, each involved party has different interests. The issuing firm aims to maximize the gross proceeds from the public offering. The underwriters' intentions are to maximize their profits, which are usually a percentage of the sale, while minimizing their risks (Bochner & Avina, 2010). On the other hand, investors primarily try to minimize the spread between offer price and nominal value of the company, while looking out for the future potential (Chambers & Dimson, 2009). From this perspective, valuation and pricing decisions of IPOs have direct and profound effects on the issuer, underwriter and investor.

Even though the pre-market decisions about valuation and pricing of the stock are among the most deterministic quantitative factors, there are a number of other qualitative and quantitative factors that affect the aftermarket success of an IPO. Some of the qualitative factors include public perception of the markets, the company and its industry, and the management's approach to the IPO process (Bochner & Avina, 2010; Ljungqvist, 1997). However, most of the quantitative factors are more directly related to the pre-market IPO management decisions including share-related technical decisions, financial and operational maturity of the company at the time of IPO, and underwriting decisions (Carter & Manaster, 1990; Clarkson, 1994; Florin & Simsek, 2007).

Another major contributor to the performance of IPOs is the condition of the capital markets. Financial crises impact the market demand by altering investor perceptions and causing disruptions to the financial markets (Mishkin, 1992). However, the extent of this impact differs from market to market (Xu & Hamori, 2012), and Henry and Gregoriou (2013) show that this case is also correct for the IPO markets. The long-run performance of IPOs in the high-demand and low-demand markets has been analyzed

historically (Loughran, Ritter & Rydqvist, 1994); nevertheless the focus of these studies was rarely financial crisis settings. Recent studies have started to document the effects of the 2008 global financial crisis on the European markets (Dorsman & Guonopoulos 2013; Gunturkun, Gurarda & Erdogan, 2012), but studies on the US markets are lagging behind (Henry & Gregoriou, 2014).

The effects of pricing and valuation on aftermarket price performance of IPOs have been well documented in the literature. Along with the technical financial management decisions, the literature also exclusively documented the impact of pre-market decisions related to operational and financial maturity of the company, (Babich & Sobel, 2004) and underwriting selections (Holland & Horton, 1993; Singh & van der Zahn, 2008) on IPO performance. Even though there are studies that reported new issues markets behaving dissimilarly in different markets and timeframes, (Chambers, 2009; Loughran, 1993) and there is some research on price performance behaviors of IPOs under financial crisis conditions; there is room for study in understanding the combined effect of these management decisions on aftermarket IPO price performance in a financial crisis environment.

1.1 Purpose of Study

Due to the uniqueness of each financial market, outcomes from different markets and timeframes often yield distinct conclusions for each. Loughran's (1993) study, which showed the varying performances of IPOs on the NYSE and NASDAQ, is a sound example of this point, and similar studies are discussed in the Literature Review section. In addition to that point, the literature is limited on the IPO studies that capture the pre- and post-financial crisis conditions in the American equity markets. Even though the

previous works cited a number of management decision factors affecting the aftermarket performance of an IPO, the effects of these decisions are only selectively adoptable to future studies due to the uniqueness of each IPO market and timeframe. Moreover, the literature is also limited regarding studies that analyze the pre-market management decisions – aftermarket performance relationship under a financial crisis environment.

The purpose of this study was to investigate the aftermarket performance of IPOs in New York's equity markets under pre- and post-crisis conditions, and to understand the correlations between pre-market management decisions and long-run price performance of IPOs in the same setting. In examining this relationship, the researcher reapplied the present methodology for the timeframes that precede and follow the 2008 global financial crisis. Also, this research gathered and analyzed market data for the benefit of market researchers, investors, issuing companies and underwriters. The conclusions of this research are available for the issuing companies and the underwriters to understand the importance of effective pre-market oversight in IPO processes and for investors to identify the factors affecting the aftermarket performance of IPO investments for future potential.

To serve this purpose, the research was designed to study the combined effects of each of these quantitative pre-market management decisions on the aftermarket price performance of IPOs in pre- and post-crisis conditions. By analyzing and comparing the pre- and post-crisis behaviors of these decision factors in different markets, the study aimed to enrich the literature by providing conclusions about pre-market decisions for issuers, underwriters, investors and market researchers in time for another financial crisis.

1.2 Research Questions

The study endeavored to answer the following research questions:

RQ1: What are the relationships between pre-market management decisions and long-run price performance of IPOs launched on the NYSE and NASDAQ that took place from 2002 to 2010?

RQ2: Does the relationships between pre-market management decisions and long-run price performance of IPOs on the NYSE and NASDAQ from 2002 to 2010 differ in the financial crisis environment years?

RQ3: How does the financial crisis environment affect the initial, short-run and long-run market-excess price performances of IPOs on the NYSE and NASDAQ from 2002 to 2010?

1.3 Importance of Study

IPOs are considered the final step of the startup financing cycle, where firms become publicly traded corporations. In 2013, companies raised over $163 billion through public offerings globally (EY Global Limited, 2013), primarily to fund the expansion of their operations. Hence, the IPOs may be considered as facilitators of economic growth, due to their rapid and low-cost capital provision. IPOs also generate a supporting industry of underwriters, independent auditors, legal counsels and other regulatory professionals.

With these significant economic implications of the IPO process, the efficiency of its management is frequently studied and documented in academic literature. The potential proceeds are measured to understand the nominal effect of pre-market management decisions, which are defined as the difference between the IPO offer price

and the issue's first day return, multiplied by number of shares outstanding. In the timeframe between 1980 – 2012, over $135 billion of potential proceeds were left on the table, globally. In 2013 alone, issuers and underwriters were unable to realize $7.42 billion in potential proceeds on a global basis. The 2013 figure accounts for 22% of overall proceeds (Ritter, 2013).

This measurement further strengthens the views of market analysts (EY Global Unlimited, 2013) on the importance of effective pre-market management and IPO decisions. From this perspective, understanding the impact of pre-market IPO management on aftermarket performance guides issuers, underwriters, and investors to optimize their efforts in maximizing gains from this process, and stimulates economic growth. By providing results from the financial crisis era, this research allows its audience to observe the differences between expansion and recession cycles and align their strategies accordingly, while enriching the literature on IPOs.

1.4 Summary of Chapter

IPOs offer instant and low-cost capital to companies seeking to raise capital to expand operations and to shareholders looking to convert ownership into cash. The year 2013 marked the best for IPOs in over a decade in the US equity markets when 222 companies raised over $54 billion through IPOs (Renaissance, 2014). These 222 companies were listed on the NYSE or NASDAQ for market trade after they went public.

Planning an IPO involves a long list of critical pre-market management decisions, which impact proceeds from the IPO as well as the aftermarket price performance. Companies were unable to realize $7.42 billion in potential proceeds in 2013 from IPOs, which accounts for 22% of overall proceeds (Ritter, 2013). For the purposes of this

research, these pre-market decisions are grouped under three categories: share-related decisions, operational and financial maturity of the company, and underwriting decisions.

Pre-market management decisions are considered to be signals by investors about the quality of the issuing company and its equity. These signals shape investors' perception about the company, and therefore affect market demand and the aftermarket price performance. For the valuation and the price decision, the company partners with auditors and underwriters, together they identify the value of shares and the underwriters handle the sale transactions. Underwriters deliberately underprice IPOs in order to stimulate market demand, while maintaining a favorable price point to the investor.

In times of financial crisis, market demand is distressed by shifts in investor perceptions and investable resource disruptions (Mishkin, 1992). This distress impacts the capital markets, including IPOs (Henry & Gregoriou, 2013). In the literature, the focus of studies analyzing the high and low demand markets is rarely the financial crisis conditions. There are recent studies that document the effects of the 2008 global financial crisis on the European markets (Gunturkun, Gurarda & Erdogan, 2012; Dorsman & Guonopoulos, 2013), but studies on US markets are lagging behind (Henry & Gregoriou, 2014).

The purpose of this study was to investigate the individual effects of each of the pre-market management decisions on the aftermarket price performance of IPOs in New York's equity markets. Moreover, the study aimed to understand the impact of the 2008 financial crisis on the relationship between pre-market management decisions and aftermarket price performance of IPOs. By analyzing and comparing the pre- and post-crisis behaviors of these decision factors in different markets, the study aimed to enrich

the literature and provide conclusions about pre-market decisions for issuers, underwriters, investors and market researchers in time for another financial crisis.

Chapter 2 – Literature Review

This chapter first looks into the evolution of the theory on initial public offerings and establishes the factors affecting market demand toward IPOs. Afterwards, the chapter presents past works about the effects of financial crises on IPO markets. In the following four subsections, the literature on eleven variables of this research is studied. Finally, it reports initial, short-run, and long-run price performance of IPOs from eleven different markets and sixteen different timeframes.

The research on initial public offerings started earlier than most other market securities in the 1960s to understand the market performance of the increased number of new stock issues, with Friend, Longstreet, Mendelson, Miller and Hess (1967). These early studies used several different methods to measure initial and aftermarket performance, largely because of theoretical gaps in the area. Later, Ibbotson (1975) applied the market-adjusted return concept to eliminate the effects of markets and seasonality. The modern application of Ibbotson's studies (1975) is discussed later in the section. Also, Ibbotson's model (1975) showed that market-adjusted returns of IPOs are independent of different timeframes.

Loughran (2002) asserted that time often changes investors' risk attitudes and the investable wealth levels. This change leads to shifts in market demand characteristics and subsequently affects the price performance of IPOs and the market. Moreover, a new stock issue comes with a number of uncertainties for the investor (Clarkson, 1994). A great majority of these uncertainties translates into risks in the eyes of investors, while some others may be dismissed from future consideration; however, all of them affect the market demand and therefore the aftermarket price performance. Therefore, the

availability of the investable resources and investors' perception of the new issue largely influences the aftermarket performance of an IPO.

By timing the IPO decision according to right operational and financial maturity levels of the firm and making the right underwriter selections, the companies that are going public signal investors about the quality and future potential of the new stock issue (Bochner & Avina, 2010). The clear communication of these choices is among the underwriter's top priorities, since investors rely on this information when they are making investment decisions (Booth & Chua, 1996). Informing the investors properly about the IPO, decreases the level of uncertainty associated with the stock and thereby influences the aftermarket performance positively (Clarkson, 1994).

The root causes of financial crises have been a topic of discussion among scholars for a long time. Some scholars (Fama, 1970) argued that capital markets are highly efficient and this efficiency determines the price of a stock based on available information. When the nature of this market information dramatically changes, the market corrects the prices dramatically, and this causes financial crises. Other scholars (Mishkin, 1992) argued that adverse selections of investors play an important role in misdirected market demand and when this misdirection intensifies, it eventually leads markets to financial crises.

Even though there are multiple approaches to the causes of financial crises, as McCarthy, Solomon and Mihalek (2012) pointed out, the effect of the crises on shifting market behavior is more apparent. Xu and Hamori (2012) documented that the dynamic characteristics of the market were remarkably different before and after financial crises. From the IPO markets' perspective, Loughran, Ritter and Rydqvist (1994) documented

the effects of market demand on long-run performance of IPOs with a large data set that covered IPOs from different markets.

Along with the variability of investor demand with time, and market conditions, the characteristics of the market also influence investor demand for IPOs. Some scholars (Allen & Faulhaber, 1989; Ritter, 1991) submitted that dissimilar market characteristics across various industries contribute to aftermarket performance differences. Contrary to other industries, Loughran (2002) showed that neither nominal valuation nor financial performance was strongly correlated with long-run price performance for technology stocks. In simple terms, investors of technology stocks do not value the tangible business, but invest mostly in the future potential and intellectual capital (Cusumano, 2012). Even though this may not be the case for investors looking for opening day returns, Loughran (2002) highlighted Amazon.com as an example of this phenomenon, whereas Cusumano (2012) posited Facebook.

The various influences of market demand result in varying IPO aftermarket performance. Many scholars argued that the initial, short-run and long-run price performance of IPOs shows different trends within different markets (Ritter, 1991). Loughran, Ritter and Rydqvist (1994) found that even though initial returns tended to be positive due to frequent underpricing practices, short-run and long-run returns varied from −47.0% to +9.0% within a sample of 6,238 IPOs from 9 developed and developing country markets within the 1980-2001 timeframe.

In line with the purpose of this study, the recent literature (Freitas, Savoia & Montini, 2008; Chambers & Dimson, 2009; Roosenboom, 2012; Hamdi, Nguyen, & Obeid, 2013) focused on providing empirical evidence from different timeframes,

markets, market conditions, and IPO attributes to enrich the literature. Since the theoretical models and their statistically sound applications have become extremely robust in the past 30 years (Aggarwal, Krigman, & Womack, 2002), scholars have been applying sample-specific modifications while testing timeframe and market differences. Also, the frequency of recent research studies in the IPO field has decreased with the number of IPOs in the markets, due to the financial crisis environment. Since researchers require a 3-year timeframe following the IPO to observe long-run performance, studies capturing the effects of the financial crisis on IPO markets are expected to increase in 2014.

2.1 Share-related Decisions and Aftermarket Performance

The pricing and valuation related decisions are the most prominent factors affecting the aftermarket price performance of IPOs, due to their direct ability to impact investor demand profoundly (Chambers & Dimson, 2009). Pricing mechanisms, positive initial and short-run returns, but subsequent long-run underperformance of initial public offerings have been examined well theoretically and empirically over the past couple of decades. When the company and the underwriter are making the pricing and valuation decisions, the company and the underwriter account for the level of uncertainty associated with the issuer, the company's ability to create price attractiveness and market demand for the new issue (Clarkson, 1994). Also, Tinic (1988) added that issuers and underwriters also consider market conditions by adjusting the offer prices and valuations in turbulent markets to account for the increase in market risk premium.

Finding the right offer price is important for the aftermarket performance of the new issue, as that is the first signal that potential buyers examine. Gompers and Mertick

(2001) argued that higher offer prices signal high new issue quality, especially for institutional investors. On contrary, Booth and Chua (1996) asserted that individual investors prefer lower prices due to their limited investible capital. From this perspective, the research aims to provide evidence from the markets to either one of these opposing approaches about the offer price of the IPO.

Lipman (2000) found that a majority of new issues sets the offer price within the $10-20 range. In line with Gompers and Mertick (2010), he further submitted that new issues offered above $20 choose those price points to claim prestige for the company. Also, Lipman (2000) noted that new issues offered below $5 are subject to the "penny stock" regulations of the Securities and Exchange Commission. In a recent study, Fernando, Krishnamurthy and Spindt (2004) documented that firms deciding on a relatively higher price enjoyed higher demand, and therefore better aftermarket performance. They also concluded that the initial performance of an IPO largely depends on the offer price. A majority of scholars (Tinic, 1988; Allen & Faulhaber, 1989; Benveniste & Spindt, 1989; Miller, 2000; Aggarwal, Krigman, & Womack, 2002) argued that the new issues are underpriced as a tactic to create initial market demand. The level of underpricing is an important determinant of the initial performance, since the market quickly moves toward the efficient price for the IPO stock.

The amount of shares offered to the public is another share-related decision factor that sends signals about the new issue (Jog & McConomy, 2003; Chahine, 2008). When private shareholders offer above or below average rates of equity, investors' perception toward the stock changes. Short and Keasey (1992) asserted that the uncertainty associated with the new issue decreases when private equity holders decide to offer fewer

shares to the public. Short and Keasey (1992) argued that this is largely because investors often consider higher share retention rates as a sign of shareholders' faith in the company's future potential. Also, with a sample of 163 IPOs that were offered during the 1990-1996 period, Kiymaz (2000) showed that the offer rate significantly impacts aftermarket performance of new issues.

The price-to-earnings ratio (P/E) of a stock indicates the amount of money investors are willing to pay for each dollar of a company's net income per share. P/E ratio is a relatively important indicator for investors, as they scrutinize this ratio when making their investment decisions (McMullen, Sanchez & Stout, 2011). The difference between investors' willingness to pay and the new issue's P/E ratio affects the initial market demand towards the IPO. Levis (1990) submitted that a significant relationship exists between P/E ratios and market demand for the new issue. In a study with 609 IPOs, Chan, Wang and Wei (2004) found out that P/E ratio has an influence on the aftermarket performance of Chinese IPOs.

The decision on the timing of an IPO can have an influence on aftermarket performance, depending on the general demand toward equity markets. Matching the IPO date with the days of above average market performance impacts the aftermarket performance of the new issue (Jain & Nag, 1996). Also, Loughran, Ritter and Rydqvist (1994) argued that deciding to go public, when the investors would value the company most, has positive impact on the aftermarket price performance of IPOs. Kliger, Gurevich and Haim (2012) found that the dates that investor demand fluctuates demonstrate certain patterns. Furthermore, Aggarwal and Conroy's (2000) study with 188 NASDAQ IPOs submitted seasonality as a factor affecting price performance of new issue stocks.

Depending on the seasons and other external effects, the perceptions toward certain companies change. Therefore, these factors that affect the market demand on the calendar day that company goes public have an influence on the aftermarket price performance of IPOs.

The stock exchanges on which issuing firms decide to be listed have different characteristics. The IPOs are subject to the various regulations of the respective stock exchanges (Bochner & Avina, 2010). Generally, the NYSE lists larger and more established companies, whereas younger and innovative companies choose to be listed on NASDAQ. In line with this trend, pricing and other attributes of stocks differ from NASDAQ to the NYSE, and this difference leads to exclusive aftermarket performance (Bruton & Prasad, 1997). Loughran (1993) posited similar deductions from a different timeframe. Also, with a sample of 168 IPOs, Bruton and Prasad (1997) documented that the decision to be listed on NASDAQ had a positive impact on the initial price performance of IPOs, whereas new issues listed on the NYSE yielded better price performance in the long-run.

The share-related decisions are the first inputs about any new issue an investor receives as he or she researches the IPO. Numerous studies have documented that these decisions are considered to be strong signals influencing investor demand both in the short-run and the long-run (Pollock & Gulati, 2007). Specifically, the long-run IPO underperformance against the market is documented to be a result of pricing and valuation decisions in the US equity markets (Miller 2000; Ljungqvist, Nanda, & Singh, 2006). Therefore, investors and underwriters approach these decisions carefully in order

to optimize investor demand, while trying to maximize the proceeds from the IPO process.

2.2 Operational and Financial Maturity Decisions

The decision to undertake the initial public offering process is a major milestone for companies. Since raising capital for the company is among the primary reasons for IPO, this decision greatly depends on the funding conditions, access to capital markets, productivity, profitability, and revenue generation (Babich & Sobel, 2004). However, these aspects about the operational and financial maturity of the company also have an impact on investor perception and market demand, which affects aftermarket price performance. Therefore deciding to go public at the right age, company size, and profitability condition becomes important for the company to maximize the capital raised from the IPO.

Market capitalization is the market's total valuation of the company. Similar to other variables, firm size also signals the investors about the company and therefore affects market demand. Singh and van der Zahn (2008) asserted that investor demand is affected by firm size, depending on the respective industry. Therefore, a company with a certain market capitalization gives different signals to the investor if those firms operate in banking or retail industry. Moreover, Dorsman and Gounopoulos (2013) found that the larger the company, the less uncertainty is among investor perceptions. With a sample of 168 IPOs, Kiymaz (2000) documented that firm size has an impact on aftermarket price performance. Both scholars use natural logarithms of market capitalization values of the firms to account for the high spread between the small and large cap firms.

The influence of a company's age on investor demand and aftermarket performance is also well documented in the literature (Miller, 2000; Chambers & Dimson, 2009). Kiymaz (2000) argued that the investors associate the age of the company with uncertainty, and the perception of company's riskiness decreases with the number of years it has operated. Therefore, when younger companies decide to go public, the amount of investor persuasion needed increases. Regardless, Ljungqvist and Wilhelm (2003) reported that the number of younger firms deciding to go public was in an increasing trend. Ritter (1991) asserted that age had a direct relationship with aftermarket performance in 1,526 IPOs that went public between 1975 and 1984. Later, with a sample of 2,904 IPOs, Field (1995) found that the price performance of companies with more than 15 years of experience are remarkably higher than start-ups with ages up to 5 years.

As mentioned above, Babich and Sobel (2004) showed that profitability plays an important role on the decision to go public. Within a sample of 228 IPOs that went public between 1990-1999, Roosenboom (2012) found that most European firms decided to wait until their profits turned positive before launching an IPO. However, another study (Ljungqvist & Wilhelm, 2003) showed that net profits of the US companies going public were in a declining trend with majority of the firms reporting negative profits in the second half of Roosenboom's (2012) timeframe. Henry and Gregoriou (2014) reported that the average profit margin of companies going public before the financial crisis was lower than those going public after the crisis, within a sample of 1033 IPOs. This point may be interpreted as the effect of financial crisis on the decision to go public with lower net profit margins, since less profitable companies often suspend or postpone IPOs in crisis environments until markets recover or their profitability improves.

The academic and corporate attention to the decision to go public depending on the profitability of the firm is comprehensible, since Chambers and Dimson (2009) argued that profitability of a firm directly affects the long-run price performance of its IPO. Negative profit margins or only short stints of profitability are considered to be risk factors by investors, which adversely affect market demand (Bochner & Avina, 2010). Also, Florin and Simsek (2007) argued that the extent of profitability's impact is not limited to price performance, since it also plays a major role on other pricing and valuation decisions. However, as previously stated, Loughran (2002) and Cusumano (2012) argued that some investors value future potential and intellectual capital above the past financial performance, especially in technology IPOs.

Financial and operational maturity of a company is an important signal for the investors and it affects market demand (Welch, 1989). Younger firms with profitability questions and smaller company sizes carry certain uncertainties in investors' eyes. Moreover, Pollock and Gulati (2007) argued that firms with less than favorable characteristics in these decision factors often employ visibility-enhancing marketing methods to reduce uncertainty associated with their IPO. Therefore, the decision to go public at a suitable maturity level of a company plays an important role in the aftermarket performance of IPOs.

2.3 Underwriter and Auditor Selection Decisions

In the US market, underwriters have a profound influence and effect on the aftermarket performance of a new issue (Higgins & Gulati, 2003). Pons-Sanz (2005) identified the United States stock issuance system as problematic due to its discretionary nature, which may allow underwriters to act in their own interest, at the expense of their

clients and investors. This argument points to agency problems between the issuer and the underwriter (Loughran, 2002). In a recent study (Aggarwal, Krigman, & Womack, 2002), it is argued that book-building managers use new issue underpricing as a strategy to maximize personal and institutional gain from selling stocks at the expiration of the lock-up period.

With this background of issues, the effects of underwriter reputation on aftermarket IPO performance have been studied extensively (Florin & Simsek 2007; Pollock & Gulati, 2007). A majority of studies showed that this decision is positively correlated both with short-run and long-run performance (Carter, Dark & Singh, 1998; Ljungqvist, Nanda & Singh, 2006). Even though moral hazard and adverse selection issues have been brought up for this decision factor, the underwriter's good reputation and experience are widely considered to be positive signals (Loughran, 2002). However, Holland & Horton (1993) exemplified the uniqueness of each IPO market by submitting that they have found no significant relationship between the underwriter and aftermarket performance in the British market.

Carter-Manaster Rankings are widely used to measure underwriter reputation. By taking the underwriting proceeds, underwriter's market share and underwriter's pricing accuracy into account, Carter-Manaster assigns a score of up to nine to each underwriter, and ranks them (Booth, Booth-Chua & Deli, 2010). Along with others, Loughran and Ritter (2004) used 8.0 as a threshold for prestigious underwriters.

Similarly, the prestige of the independent auditor is also considered a positive signal by investors, and it has an impact on aftermarket performance (Holland & Horton, 1993; Jain & Martin, 2005). Including Chambers and Dimson (2009), most analyses have

determined that the link between the involvement of independent auditors and price performance is not statistically significant; however, Clarkson (1994) found that auditor reputation decreases the level of uncertainty associated with the IPO. The Big Four professional service companies operate in most of the major developed and developing markets with considerably high aggregate market shares. This being the case, limiting the prestigious auditors list to these four has become a common practice among researchers (Jog & McConomy, 2003; Singh & van der Zahn, 2008).

The uncertainties regarding the issuing company are among the main factors that influence investors' perception and the market demand. Literature shows that the decision to involve prestigious lead underwriters and independent auditors with good reputations decreases the magnitude of this uncertainty and impacts market demand (Clarkson, 1994). Therefore, when investors associate the underwriting professionals' reputation with the quality of the IPO, their perception is altered, which subsequently affects the aftermarket performance.

2.4 Measuring Aftermarket Price Performance and Evidence from Global Markets

The aim of measuring aftermarket price performance of stocks is to analyze the value of investing in that stock in comparison to a benchmark (Barber & Lyon, 1997). By normalizing the investment against a consistent benchmark, this measurement method determines the stock's value at any desired time horizon, whether initial, short-run or long-run. Barber and Lyon (1997) showed that these performance comparison benchmarks could be reference portfolios, including market indexes; collections of similar sized stocks, or collection of companies with similar book-to-market ratios. However, failing to select the correct benchmark may result in biased conclusions

(Kothari & Warner, 1997). In their theoretical study, Lyon, Barber & Tsai (1999) showed that using a value-weighted or an equally-weighted market index, in which the stock is listed, is a sound measurement of the aftermarket price performance for stocks.

The IPO studies using this measurement for the aftermarket price performance report statistically significant conclusions from different markets around the globe, some of which are shown in Table 2-1. Even though a majority of their directions are consistent, the magnitude of aftermarket performance varies in line with each market having a unique nature. Two studies (Aggarwal, Leal & Hernandez, 1993; Freitas, Savoia & Montini, 2008) provided examples of the same market showing dissimilar behaviors in different timeframes. Also, the variances in magnitude of aftermarket performance exemplify the unique nature of each market. Additionally, since the research used a similar methodology, Table 2-1 is also used as a literature comparison benchmark for the results of this research.

Table 2-1

Initial, Short-run and Long-run Performance of Initial Public Offerings from 11 Countries and 16 Time-frames

Market	Study	Sample Period	Sample Size	Initial Returns (%)	Short-run Performance (%)	Long-run Performance (%)
United States	Ritter (1987)	1977-82	664	14.8		
	Loughran (1993)	1967-87	3,556			-33.3
	Aggarwal & Rivoli (1993)	1977-87	1,598	10.8	-13.7	
	Rajan & Servaes (1997)	1975-87	2,725			-40.6
Brazil	Aggarwal, Leal & Hernandez	1980-90	62	78.5	39.2	-25.6
	Freitas, Savoia & Montini (2008)	2004-06	30	3.1		14.3
United Kingdom	Levis (1993)	1980-88	712	14.3	1.6	-8.1
	Chambers (2009)	1960-86	1,458	13.0		
Germany	Ljungqvist (1997)	1970-93	189	9.2		-12.1
Greece	Tsangarakis (2004)	1993-97	106	9.1	38.8	
Finland	Keloharju (1993)	1984-89	80	8.7		-9.7
Singapore	Koh & Walter (1989)	1973-87	70	27.0		
Spain	Alvarez & Gonzalez (2005)	1987-97	52	14.0	3.0	-28.0
Sweden	Loughran, Ritter & Rydqvist	1980-90	162	38.2		1.2
Thailand	Vithessonthi (2008)	1999-2005	43			-41.7
Turkey	Kiymaz (2000)	1990-96	163	13.1	3.0	

Although all of the studies reported above use this measurement method with equally-weighted or value-weighted market indexes as the benchmark, studies using a portfolio of comparable sized companies, including Ritter (1991) and Dorsman and Guonopoulos (2013) also reported very similar results.

In conclusion, different timeframes and markets often yield unique results. The literature documented that pre-market decisions about the IPO shape investor perceptions about the quality of the issuing company. Share-related decisions, including pricing and valuation, appear to be the most prominent factors affecting investor demand characteristics and aftermarket IPO performance. Also, operational and financial maturity decisions of the company, and the underwriting professionals selection decision, are considered signals that shape investor demand. Therefore, effects of these decisions on price performance vary with investor perceptions within different markets and timeframes. Moreover, the recent literature focused on providing empirical evidence from different timeframes, markets, and market conditions, to enrich the literature. From this perspective, this research supplied original conclusions to expand the literature by analyzing the relationship between these pre-market decisions and aftermarket performance in a crisis environment.

2.5 Summary of Chapter

Initial public offerings have been studied since the 1960s, when the number of new stock issues started to increase rapidly. Ibbotson (1975) measured the aftermarket performance by eliminating the effects of markets and seasonality with the market-adjusted return concept. The studies following this measurement technique showed that changes in investors' perceptions and the level of investible resources shaped market

demand (Loughran, 2002). Clarkson (1994) pointed out that the level of uncertainties associated with the IPO influence the perceptions of investors, while other scholars (Fama, 1970; Mishkin, 1992; Loughran, Ritter & Rydqvist, 1994; Xu & Hamori, 2012;) studied the effects of financial crises on the market demand.

Pre-market IPO management decisions signal investors about the quality of the IPO, while altering perceptions and decreasing uncertainties associated with the stock (Clarkson, 1994; Bochner & Avina, 2010). The decision on the offer price is among the first signals that investors receive and even though a majority of new issues are offered within the $10-20 range (Lipman, 2000), higher prices are often associated with a higher quality firm. One argument about the offer rate is that higher share retention signals the private shareholders' faith in the business (Short and Keasey, 1992); and Kiymaz (2000) documented its impact on aftermarket performance. Chan, Wang and Wei (2004) showed the influence of the P/E ratio on aftermarket IPO performance, whereas Jain and Nag (1996) submitted the impact of the general demand toward capital markets on the performance on the calendar day of the IPO. Bruton and Prasad (1997) posited the varying characteristics and aftermarket performance of NASDAQ and NYSE IPOs, while pointing to the importance of the stock exchange listing decision.

Similarly, the decision to go public at certain levels of operational and financial maturity is another determinant of aftermarket performance (Babich & Sobel, 2004). Dorsman and Gounopoulos (2013) found that the uncertainty associated with the larger market capitalization companies is lower. Field (1995) showed that older companies experience higher aftermarket returns than younger start-ups, even though the number of younger IPO firms is increasing with time (Ljungqvist and Wilhelm, 2003). Although the

profitability of an IPO company is interpreted as a positive signal (Chambers & Dimson, 2009), Loughran (2002) and Cusumano (2012) argued that investors in technology IPOs value future potential over past performance. The involvement of reputable underwriting professionals in the IPO process is generally considered as a positive signal about the quality of an IPO (Jain & Martin, 2005; Ljungqvist, Nanda & Singh, 2006), even though there are mixed empirical studies in the literature. Carter-Manaster Rankings are frequently used to measure the reputation of the lead underwriter (Booth, Booth-Chua & Deli, 2010), while using one of the Big Four professional companies, as a prestigious auditor, is a common practice (Jog & McConomy, 2003; Singh & van der Zahn, 2008).

Along with the investor perceptions and market conditions, the impact of market characteristics on IPO aftermarket performance was also researched in the literature. Allen and Faulhaber (1989) found different IPO market performance patterns across various industries, while Loughran, Ritter and Rydqvist (1994) showed the varying performance of IPO markets from different countries. Lyon, Barber & Tsai (1999) showed that benchmarking against a value-weighted or an equally-weighted market index is a sound measurement of the aftermarket price performance. With strong theoretical models and unique influences of aftermarket performance, recent literature has largely focused on providing empirical evidence from different timeframes, markets, and market conditions. This research aimed to supply original conclusions to expand the literature by analyzing the relationship between these pre-market decisions and aftermarket performance in a crisis environment.

Chapter 3 – Research Design and Methodology

3.1 Problem Definition and Research Questions

As the literature pointed out, the financial markets are unique and this uniqueness enabled researchers to derive original and valuable conclusions from different markets and different time frames for the use of issuers, underwriters, investors, and market researchers. The literature review also yielded the view that IPO studies that discover the market dynamics around financial crises in American equity markets are limited. The previous studies identified some pre-market IPO management decisions that affect aftermarket performance; however, the literature on studies that analyze the management decisions – aftermarket performance relationship under a financial crisis environment is also limited. The following research questions are formulized in order to address the problem:

RQ1: What are the relationships between pre-market management decisions and long-run price performance of IPOs launched on the NYSE and NASDAQ that took place from 2002 to 2010?

RQ2: Does the relationships between pre-market management decisions and long-run price performance of IPOs on the NYSE and NASDAQ from 2002 to 2010 differ in the financial crisis environment years?

RQ3: How does the financial crisis environment affect the initial, short-run and long-run market-excess price performances of IPOs on the NYSE and NASDAQ from 2002 to 2010?

3.2 Methodology

The study was designed to capture the relationship between pre-market management decisions and long-run IPO price performance in the pre- and post-financial crisis environment. In order to investigate the links between the two, the research followed a quantitative descriptive design. In broad terms, this design included a longitudinal analysis of the effects of pre-market decisions including IPO share-related factors, financial and operational maturity of the company, and underwriting decisions on aftermarket price performance. The research followed a post-positivist view in order to conduct an empirical observation and measurement of the aftermarket effects of pre-market management decisions and analyze them for the benefits of issuers, underwriters, investors, and market researchers. One of the reasons for adopting this worldview was to present a new understanding of the IPO markets from a unique timeframe by limiting the data set to the pre- and post-crisis market environment. Also in line with this worldview, the study performed a series of statistical validity and robustness tests to correct bias and autocorrelation issues.

Initial public offerings (IPOs) are considered to be the first sale process of a private company's common stock to the general public through a stock exchange. Therefore, the research observed only first issue company common stocks, which represents ownership of a company that is issued to the public for the first time. A common stockholder may or may not have voting rights, depending on the stock class and common shareholders are below creditors and preferred shareholders in terms of payment priority. The data set excluded the following new public offerings: preferred stock issues, exchange traded products (ETP), open- and closed-end mutual trusts, unit

investment trusts, self-advised trusts, real estate investment trusts, American Depositary Shares (ADS), and other structured products. These new public offerings were excluded on the basis that they do not fall into the operational definition of first issue company stocks. Also, issuing companies which were withdrawn, delisted, acquired, went back private, filed for bankruptcy or decided to be listed on other exchanges within the 3 year period from their issue date were also excluded on the basis that there is not sufficient data for aftermarket performance analysis. The Data Collection section examines the full extent of exclusions in detail.

The data set possessed the market information of 607 new common stock issues, which follows the abovementioned operational definition. These new issues went public on the New York Stock Exchange (NYSE) and National Association of Securities Dealers Automated Quotations Stock Market (NASDAQ) within the January 1, 2002 and December 31, 2010 timeframe. The data set included stocks from both of the major exchanges for the comprehensiveness of the study and to maximize the number of observations. However, choosing to be listed on the NYSE or NASDAQ is also a management decision, and it is observed as an independent variable throughout the data set.

The main reason for the data set to contain new issues that went public within the 2002 – 2010 timeframe was in order to clearly capture the affects of financial crisis. The data set was divided into three 3-year windows; 2002-2004, 2005-2007, 2008-2010, where the second window acted as the pre-financial crisis interval, the third window was the post-financial crisis interval, while the first window acted as a benchmark interval. Since the number of IPOs that took place in the last quarter of 2007 and the first half of

2008 was very limited, there were no separate designations for the actual crisis duration. The few IPOs that were conducted in these timeframes were included in either the pre-crisis or the post-crisis timeframe. Each of the new issue stocks was observed for 3 years; therefore the last observation of an individual price was on December 30, 2013.

This study collected all of its data from publicly available sources and databases. The primary data source for this study was the United States Securities and Exchange Commission Electronic Data Gathering, Analysis and Retrieval (EDGAR) system (United States Securities and Exchange Commission, 2014). The statistical data for all of the pre-market IPO management decisions were collected from companies' S-1 SEC Filings and IPO prospectuses filed pursuant to Rule 424(b). These forms include share-related decisions, financial and operational maturity indicators, and underwriting professional selections of the issuing firm. The copy of a blank SEC Form S-1 is included in Appendix A for further exhibition of the form's information content. Also, the 3-year aftermarket price performance of new issue stocks and the performance of market indexes from 2002 to 2010 were extracted from Bloomberg Professional Service Software and they were verified from Thomson Reuters DataStream.

The underwriters, independent auditors, and the issuing firm author S-1 Forms and IPO prospectuses according to SEC standards. Therefore, due to strict SEC scrutiny, the share-related decisions, financial and operational maturity indicators, and underwriting professional selection data were both reasonably reliable and valid. For the aftermarket price data, the researcher used two of the most prevalent market databases. The reliability and validity of the 3-year aftermarket price performance of IPOs were confirmed by matching the price data in both databases.

In order to answer the research questions, the dependent variable was identified as the aftermarket long-run price performance of the 607 new common stock issues that is observed for 756 days (3 trading years). The price changes of each of the 607 new issues were noted for the first day, first week, first month, first quarter, first year, second year and third year. Each stock's price appreciation or deprecation was measured with respect to the offer price. For the RQ1 and the RQ2, the long-run was defined as the observation timeframe of the new issue aftermarket price performance from the first trading year to the third trading year. The RQ3 used the same operational definition for the long-run, however the initial timeframe was defined as the first trading day performance and the short-run was defined as the timeframe between the second trading day and the first year of trading.

Following the data collection, the dependent variables were adjusted for the market conditions and seasonality effects using Keloharju's (1993) model, which is explained in the Model subsection in detail. With this treatment, a positive price performance was defined as a market-excess return and they acted as the dependent variables for RQ1 and RQ2.

The ten independent variables that were tested fall under three categories. The company and the underwriter cooperate to make the share-related decisions with the independent auditors' input about the company. The share-related decisions investigated in this research were share price; offer rate, initial price-to-earnings ratio, IPO date, and stock exchange decision of the issuing firm. Secondly, the effects of market capitalization, age of the company, and net profit margin were tested to understand the effects of the operating and financial maturity of the company on the aftermarket price

performance of IPOs. The third and last category analyzed the importance of the underwriting professionals selection by investigating the effects of auditor and underwriter prestige on aftermarket performance.

The aftermarket price performance of any share in the marketplace largely depends on the market demand. These ten decisions are considered to be signals by investors and therefore affect the market demand. By studying these variables, the researcher analyzed the magnitude and the direction of the variables' effect on the aftermarket price performance of IPOs. The keywords in parentheses are used to notate each variable in the regression analysis software and reporting.

3.2.1 Share-related decisions.

Share price (*SHPRICE*): the offering price of one share at the first trading day. The information about the share price was directly collected from the cover pages of S-1 Filings and confirmed by market data as the opening price of the IPO. The issuing company decides upon a share price with underwriter's advice. It does not affect the valuation of the company independent of the decision on the number of shares outstanding. However, the price points outside the $10-20 range are perceived as signals by investors, and they associate higher prices with prestige (Lipman, 2000; Gompers & Mertick, 2010). A contrary point by Booth and Chua (1996) argued that lower price points attract investors with limited investible capital. Also, the share price decision is important for future stock split considerations and marketing purposes, which impacts market demand (Bochner & Avina, 2010).

Offer rate (*OFRATE*): the percentage of shares offered with respect to shares outstanding. The number of shares offered and shares outstanding were collected directly

from the company's S-1 Filings and 424(b) Form. This rate includes the newly created shares and the amount of shares offered by private shareholders. Above average percentages of equity offered may raise questions about the owners' faith in the future of the business (Short & Keasey, 1992). Below average offer rates may be interpreted as private shareholders trying to keep their authority over the company (Kiymaz, 2000).

Initial price-to-earnings ratio (*INIPE*): the trailing price-to-earnings (P/E) ratio of the stock at the first day of trading, calculated as offer price over net income per shares outstanding as of last financial statement included in S-1 Filings and 424(b) Form. The P/E ratio demonstrates investors' willingness to pay for each dollar of earnings. Since the company decides upon the initial ratio by setting the share price with respect to earnings, this variable affects the market demand toward the stock. A P/E ratio set below the industry average give a negative signal about the quality of the IPO (Levis, 1990), whereas the price performance increases with the number of investors who are willing to pay more than the set P/E ratio.

Days since fiscal year end (*FYEDAY*): the number of calendar days, which have passed since the last financial statement at the fiscal year end. The calendar date of the issue and fiscal year end data was collected from the 424(b) Form. The seasons affect spending and investment behaviors of investors, and shift the market demand for initial public offerings. The demand patterns at the exact date a company decides to go public affect the long-run price performance of stocks (Kliger, Gurevich & Haim, 2012; Dorsman & Guonopoulos 2013). The ability to match the high demand periods with the date of issue would have a positive influence on the initial price performance of the IPO.

Stock exchange (*STEX*): the decision to be listed on the NYSE or NASDAQ. The listing information was directly collected from the cover page of S-1 Filings and confirmed by market data as the IPO starts to trade. Loughran (1993) found that the aftermarket performance of new issues differs from market to market. This variable was designed to test if they remain different in financial crisis conditions. The dummy variable took 1 if the company is listed on the NYSE, 0 if listed on NASDAQ.

3.2.2 Operational and financial maturity decisions.

Market capitalization (*MCAP*): the market valuation of the company on the first day of trading that is calculated as the opening share price multiplied with shares outstanding (Chambers & Dimson, 2009). As mentioned before, the share price and the number of shares outstanding was taken from the cover page of S-1 Filings and 424(b) Form. The issuer, the underwriter, and independent analysts collaborate to decide upon this valuation, and the difference between internal valuation and market perception impacts the market demand and therefore aftermarket performance (Roosenboom, 2012). In line with the literature, the natural logarithm of market capitalization was taken since the nominal difference of the sample sizes was expected to be great. Previously, Dorsman and Gounopoulos (2013) documented a negative relationship between the firm size and investors' uncertainty perceptions.

Age of the company (*AGE*): the number of years that the company has operated before the decision to go public. The establishment date of the company was taken from the company information section of the S-1 Filings and 424(b) Forms. The age of company signals to investors about the operational maturity of the firm (Carter, Dark & Singh, 1998; Florin & Simsek, 2007). Field (1995) found that more established

companies perform better than start-ups in the same market. Similar to the market capitalization, natural logarithm of market capitalization was taken into account to address the nominal differences of extremums. Also, consistent with the literature, a one-year lag was added since there are companies with less than 1 year of operation in the data set.

Net profit margin (*NPM*): the net profit margin of the company as of last financial statement, calculated as net income over revenue. Revenue and net income information about the firm was collected from the financial statements in S-1 Filings and 424(b) Forms. The profitability of the company signals the financial maturity of the company to investors. Negative net profit margins may raise questions about the financial health and the future potential of the company, and affect the aftermarket price performance. (Ljungqvist & Wilhelm, 2003; Alvarez & Gonzalez, 2005)

3.2.3 Underwriting professional selection decisions.

Underwriter selection (*UWRITE*): the lead underwriting company that handles the IPO process. The dummy variable took on the value of 1 if the underwriting company is a prestigious underwriter, 0 if not. Carter-Manaster Rankings measure underwriting proceeds, industry market share, and pricing accuracy of underwriters to determine their reputation (Booth, Booth-Chua & Deli, 2010). For this variable, the prestigious underwriter is defined as a company that has never scored below 8.5 in Carter-Manaster Reputation Rankings for IPO Underwriters between 2002 and 2013 (Loughran & Ritter, 2004; Ritter, 2011). The seven underwriters, which scored 8.5 and above within the timeframe, are Bank of America – Merrill Lynch, Citigroup, Credit Suisse Group, Deutsche Bank AG, Goldman Sachs Group, JP Morgan Chase & Co., and Morgan

Stanley International. The lead underwriters' names are listed on the cover page of S-1 Filings and 424(b) Forms. Selecting a prestigious lead underwriter to handle the IPO processes is widely considered a positive signal to investors (Florin & Simsek, 2007; Pollock & Gulati, 2007), although there are opposing studies in the literature (Holland & Horton, 1993).

Auditor selection (*AUDIT*): the auditor company that facilitates the underwriting process. The dummy variable took on the value of 1 if the company is one of the Big Four, 0 if not. The Big Four international professional services networks are Deloitte Touche Tohmatsu Limited, Ernst & Young, KPMG, and PricewaterhouseCoopers. The name of the independent auditor is disclosed at the beginning of the Financial Statements section of S-1 Filings and 424(b) Forms. Choosing a world-renowned independent auditor to assist with IPO valuation is also a positive signal, as it decreases the level of uncertainty associated with the IPO (Clarkson, 1994; Jain & Martin, 2005).

The literature asserted the influences of different industries in pre-market management decisions and the aftermarket price performance relationship. Investors associate technology companies with higher risk and higher return; therefore, the market prices these shares differently (Lowry & Schwert, 2004; Booth, Booth-Chua & Deli, 2010). Also, Loughran (2002) and Cusumano (2012) submitted that the impact of maturity decisions is overshadowed by the future potential and intellectual capital of technology IPOs. Therefore, the industry of the firm moderates the relationship between pre-market IPO decisions and aftermarket price performance. Due to the high frequency of technology and pharmaceutical IPOs, adding an industry variable was not feasible for

the data set. However, their moderating role is discussed in the Descriptive Statistics subsection.

Independent variables; share price, offer rate, initial price-to-earnings ratio, days since fiscal year end, market capitalization, age of the company and net profit margin were measured with ratio scale. Stock exchange decision, underwriter selection and auditor selection are dichotomous variables, which are measured with nominal scale. Also, the dependent variable (after-market price performance) was measured with ratio scale.

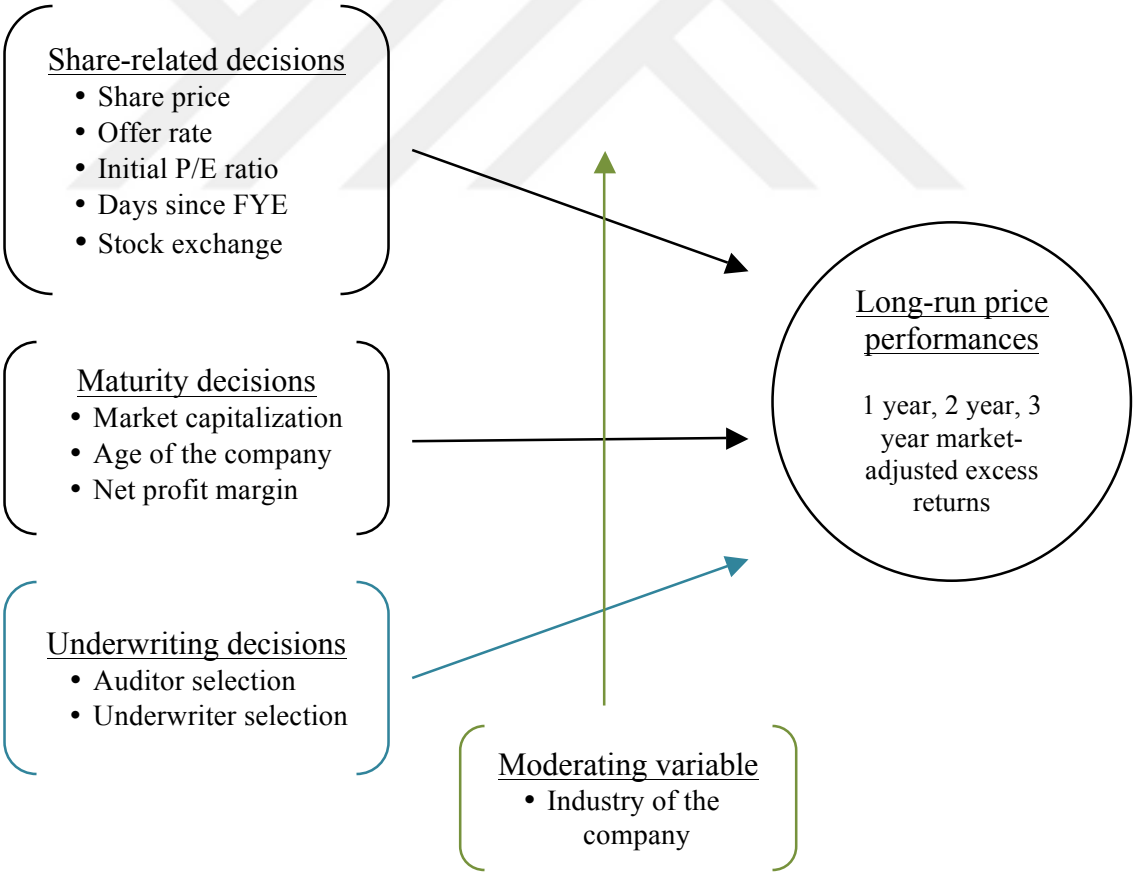

Figure 3-1. Independent, moderating and dependent variables for the first model.

For the third research question (RQ3), the dependent variable was the first day, first week, first month, first quarter, first year, second year and third year price performance of new issues. Similar to the first model, they were adjusted for market conditions using Keloharju's (1993) model, which is explained in detail in the next subsection. Independent variables for this model were the time periods, in order to observe the effects of the financial crisis. New common shares issued between 2002 and 2004 acted as the benchmark. 2005-2007 issues constituted the pre-financial crisis interval and 2008-2010 period represented the post-financial crisis interval. By analyzing the differences in dependent variables during the three timeframes, the researcher analyzed the effects of the financial crisis on market-excess new issue returns.

3.3 The Model

To fulfill the purpose of investigating the aftermarket performance of 607 new issues within the 2008 financial crisis timeframe, the researcher used a derivation of Keloharju's (1993) model. The model measures the aftermarket price performance of IPOs with respect to the market benchmark. By adjusting stock returns, the model normalized the data for the effects of economic conditions and the market performance. However, more importantly, it measured the value of investing at initial term, short-run, or long-run with respect to a consistent benchmark. The value weighted market-adjusted initial abnormal return (MAAR) function determines the first and subsequent day performances:

$$MAAR = \frac{1}{n_d} \sum_{d=1}^{n_d} (r_{sd} - r_{md})$$

where n_d: number of trading days,

r_s: stock return (for each stock)

r_m: market return (NYSE Composite Index or NASDAQ Composite Index, depending on the new issue's listing exchange)

Subsequently, the cumulative short-run and long-run aftermarket returns were measured using the cumulative market-adjusted abnormal return (CMAAR) and the cumulative average return (CAR):

$$CMAAR_t = \sum_{d=0}^{t} MAAR_d$$

$$CAR_t = \sum_{d=0}^{t} r_{sd}$$

where t is 1, 5, 21-22, 81-84, 252, 504 and 756 days (1 day, 1 week, 1 month, 1 quarter, 1 year, 2 and 3 years depending on the number of trading days). Therefore, cumulative results for each investment horizon were calculated by adding the returns prior to that trading day.

In order to answer the RQ1 and the RQ2 about understanding the relationships between pre-market management decisions (independent variables) and long-run IPO price performance (dependent variable) in the pre- and post-crisis environment, the researcher performed a linear regression analysis with the ordinary least squares method. This method was used to estimate the magnitude and direction of the relationships between the management decisions and aftermarket price performance (Cooper & Schindler, 2014). The dependent variable was the cumulative market-adjusted abnormal return, as mentioned above. Using market-adjusted abnormal return allowed the researcher to understand the effects of pre-market decisions that are isolated from market conditions. For initial and short-run performance in first day, first week, first month and

first quarter; and for the long-run performance in 1 year, 2 year and 3 year, the researcher employed seven separate linear models for each time period:

$$\Delta MAP_{D,W,M,Q,Y1,Y2,Y3} = \alpha + \beta_1 SHPRICE + \beta_2 OFRATE + \beta_3 INIPE + \beta_4 FYEDAY + \beta_5 STEX + \beta_6 \ln(MCAP) + \beta_7 ln(1 + AGE) + \beta_8 NPM + \beta_9 UWRITE + \beta_{10} AUDIT + \varepsilon$$

where ΔMAP is the cumulative market-adjusted abnormal return.

For RQ2, the IPOs were grouped into 2002 to 2004, 2005 to 2007, and 2008 to 2010 periods, according to their offer dates. To understand the effects of financial crisis on the market decisions – long-run performance relationship, the researcher employed the same linear models for each time-frame. Following the confirmation of normal data distribution, an f-statistics test and an r-squared test were used to assess the statistical robustness of the model. T-statistics test determined the statistical significance of the conclusion about market decisions – long-run performance relationships. White test was employed to test and correct for heteroscedasticity in the regression analysis (White, 1980). Also, particular attention was paid to the Durbin-Watson statistics for the level of autocorrelation in the data set. The level of autocorrelation in the data determines the necessity of researcher interference.

To answer the RQ3 about the effects of financial crisis on initial, short-run, and long-run price performance, price performance of the new issues was investigated under pre-financial crisis, post-financial crisis, and benchmark conditions. The dependent variable of IPO price performance were treated for economic and market conditions using the same cumulative market-adjusted abnormal return (CMAAR) method. CMAAR for

607 new issues was calculated for the 1st, 5th, 21st-22nd, 81st-84th, 252nd, 504th and 756th trading day. Subsequently, these price performances were grouped by benchmark, pre-financial crisis, and post-financial crisis timeframes, which are 2002-04, 2005-07, 2008-2010 respectively. The effects of the financial crisis were pointed out by analyzing the differences in IPO price performance under different timeframes.

This model was designed to investigate the differences between the pre-financial crisis market and the post-financial crisis market in terms of both the market decisions – long-run performance relationship and the initial, short-run and long-run price performance. Because investor demand is one of the key drivers of stock performance, pre-market IPO decisions reflect the variances in investor behavior due to the signals relayed by these decisions. Analyzing the different pre- and post-financial crisis characteristics of the IPO market with this methodology and model was the main contribution of this research to the literature. The research design foresaw running into statistical flaws in the market data, and autocorrelation issues to a lesser extent; and proposed tests and corrections to overcome them.

3.4 Summary of Chapter

The research was designed to illuminate the relationship between pre-market management and aftermarket price performance in the pre- and post-financial crisis environment. It followed a longitudinal quantitative design to understand the effects of share-related decisions, financial and operational maturity decisions, and underwriting decisions. In the research, the data set was limited to IPOs, which are defined as first issue company stocks and therefore, it excluded the rest of new offerings to the capital markets.

All data sources are publicly available and include the United States Securities and Exchange Commission Electronic Data Gathering, Analysis and Retrieval (EDGAR) system; Bloomberg Professional Service Software; and Thomson Reuters DataStream. Information about independent variables, which are the pre-market management decisions, was gathered from EDGAR; whereas aftermarket stock performance data was collected from Bloomberg and Datastream.

Ten independent variables were grouped under three categories: share-related decisions, financial and operational maturity decisions, and underwriting decisions. Share-related decisions include share price, offer rate, initial price-to-earnings ratio, days since fiscal year end, and stock exchange. Operational and financial maturity decisions consist of market capitalization, age of the company, and profit margin. The underwriting professional selection decisions are the choices for underwriter and the independent auditor.

To measure the value of investing in IPOs in the initial term, short-run and long-run, the research employed a variation of Keloharju's (1993) model. By removing the market's contribution to the stock return, the dependent variable became the cumulative market-adjusted abnormal return. For RQ3, this model was used to measure the differences in IPO returns under pre- and post-financial crisis conditions. Also, the research employed certain statistical tests for the robustness of the model and unbiased results. Special attention was paid to autocorrelation in the regression analysis, in order to determine the necessity for researcher interference.

Chapter 4 – Data Collection

In the interest of providing the literature with a study that focuses on pre- and post-crisis conditions, the data was selected from a timeframe that spans from January 1, 2002 to December 31, 2010. In that timeframe, there were 1272 public offerings listed in the United States Securities and Exchange Commission Electronic Data Gathering, Analysis and Retrieval (EDGAR) system (United States Securities and Exchange Commission, 2014). Of these public offerings, 665 were excluded from the data set on the basis that either they do not fall into the operational definition of first issue company stocks stated in the Research Design and Methodology section, or they do not have sufficient data for aftermarket performance analysis. These 665 excluded public offerings include exchange traded products (ETP), open- and closed-end mutual trusts, unit investment trusts, self-advised trusts, real estate investment trusts, American Depositary Shares (ADS), and other structured products, as well as companies that were withdrawn, delisted, acquired, taken private, filed for bankruptcy, or changed stock exchange listings within the 3 year period from their issue date. Also, a few of them were excluded because they decided to be listed on an exchange other than the NYSE or NASDAQ.

Data for the remaining 607 IPOs were collected from the United States Securities and Exchange Commission Electronic Data Gathering, Analysis and Retrieval (EDGAR) system; Bloomberg Professional Service Software; and Thomson Reuters DataStream. The data for independent variables, including share-related decisions, financial and operational maturity indicators, and underwriting professional selections of the issuing firm were collected from companies' S-1 SEC Filings and IPO prospectuses, filed pursuant to Rule 424(b). The market-adjusted initial, short-run, and long-run price

performance of new issue stocks and the market performance of the NYSE and NASDAQ Composite indexes from 2002 to 2010 were extracted from Bloomberg Professional Service Software and were verified from Thomson Reuters DataStream. Although the market information is readily available from other publicly available resources, the researcher chose these databases for the availability of structured data. Using structured data eliminated the necessity to correct the price data for stock splits and capital augmentations. Appendix A exhibits the information content of SEC Form S-1, and Table 4-1 refers to the exact location of each input from the publicly available data sources.

Table 4-1
Data Sources of Independent and Dependent Variables

Variables	Required Input	Data Source
Share Price	Offering price at the first trading day	Cover page of S-1 Filings and 424(b) Forms
Offer Rate	Amount of shares offered Amount of shares outstanding	Cover page of S-1 Filings and 424(b) Forms
Price-to-Earnings Ratio	Offering price at the first trading day Amount of shares outstanding	Cover page of S-1 Filings and 424(b) Forms
	Net income of the company	Financial statements section of S-1 Filings and 424(b) Forms
Days Since Fiscal Year End	Offer date	Cover page of S-1 Filings and 424(b) Forms
	Fiscal year end	Financial statements section of S-1 Filings and 424(b) Forms
Stock Exchange	Listing decision	Cover page of S-1 Filings and 424(b) Forms
Market Capitalization	Offering price at the first trading day Amount of shares outstanding	Cover page of S-1 Filings and 424(b) Forms
Age of the Company	Offer date	Cover page of S-1 Filings and 424(b) Forms
	Establishment date of the company	Company information section of S-1 Filings and 424(b) Forms
Net Profit Margin	Net income of the company Revenue of the company	Financial statements section of S-1 Filings and 424(b) Forms
Underwriter Selection	The lead underwriter	Cover page of S-1 Filings and 424(b) Forms
Auditor Selection	Independent auditor	Financial statements section of S-1 Filings and 424(b) Forms
Aftermarket performance	Offering price at the first trading day	Cover page of S-1 Filings and 424(b) Forms
	Closing price at the first trading day, week, month, quarter, year, second and third trading years	Bloomberg Professional Service Software and Thomson Reuters Datastream for structured results; publicly available elsewhere
	NYSE and NASDAQ Composite Indexes from Jan 1, 2002 to Dec 31, 2010	

4.1 Descriptive Statistics

The distribution of 607 IPOs over time and across stock exchanges is shown in Table 4-2. There is a notable increase in the number of IPOs in the pre-crisis period from the benchmark period. It is also observable that the number of companies choosing to be listed on NASDAQ was higher than those choosing the NYSE; however, the magnitude of this tendency decreases in the post-crisis period. Over the years, the number of NASDAQ issues never fell behind NYSE issues; however, in 2003 and 2008, the number of issues in the two markets was the same. Figure 4-1 displays the decreasing trend of new issues and the differences between the two markets.

Table 4-2
Number of IPOs per Year and per Sample Period

Sample Period	All	NASDAQ	NYSE
2002	29	19	10
2003	34	17	17
2004	94	64	30
Benchmark	157	100 (63.69%)	57 (36.31%)
2005	94	57	37
2006	107	71	36
2007	110	72	38
Pre-crisis	311	200 (64.31%)	111 (35.69%)
2008	14	7	7
2009	37	19	18
2010	88	50	38
Post-crisis	139	76 (54.68%)	63 (45.32%)
All	607	376 (61.94%)	231 (38.06%)

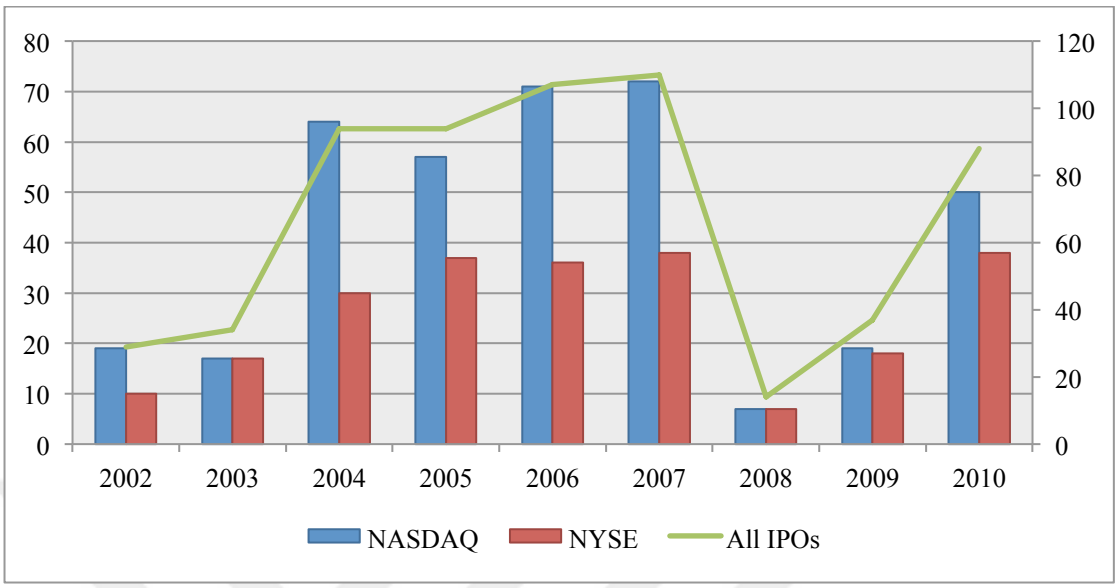

Figure 4-1. The number of NASDAQ and NYSE IPOs in the data set over time across stock exchanges from 2002 to 2010.

As mentioned above, the IPOs with interruptions in their dependent variable data series were eliminated from the data set, since measuring their aftermarket performance was effectively impossible without prices. However, this is not the case for independent variables, since even null values signal information about the pre-market decisions of IPOs. Out of 376 NASDAQ IPOs that went public from 2002 to 2010, 31 companies had zero values in at least one independent variable data point. This number accounts for 8.2% of all companies going public in NASDAQ within 2002 – 2010 timeframe.

Among NASDAQ issuers, 29 had no revenues; 25 of these were pharmaceutical research companies, 2 were software development companies and the remaining 2 were *carte blanche* companies, looking to raise money to invest in tangible businesses like transportation and energy. Two of these 29 NASDAQ companies also had no employees, along with an additional 2 NASDAQ companies, whose business models require the hiring of plant, property, and equipment with contracted employees. The number of companies with null values in the NYSE was relatively smaller, with only 4 companies,

or 1.7%, reporting zero values in their independent variable data points. Two of them were *carte blanche* companies reporting no revenues, with one also reporting no employees. Also, the remaining two companies had no employees. Since having no revenues or no employees are signals that decrease the uncertainty of financial and operational maturity of the issuing companies, these 35 companies were not excluded from the data set.

The companies in the data set were grouped according to industry categories of the NYSE and NASDAQ. Table 4-3 reports their frequencies across stock exchanges. Issuing companies operating in technology, healthcare, and the financial sectors account for more than half the entire data set. Even though a majority of technology and healthcare firms chose to be listed on NASDAQ, the NYSE led the stock exchange choice for financial companies. Also, the distribution of industries was consistent over different periods. Figure 4-2 depicts the shares of industries within the data set.

Table 4-3
Sectors of Companies in the Data Set

Sectors	All Data	NASDAQ	NYSE
Basic Industries	29	10	19
Capital Goods	26	15	11
Consumer Durables	13	6	7
Consumer Non-Durables	24	13	11
Consumer Services	86	50	36
Energy	39	13	26
Finance	90	41	49
Health Care	109	97	12
Miscellaneous	27	17	10
Public Utilities	22	12	10
Technology	117	89	28
Transportation	25	13	12

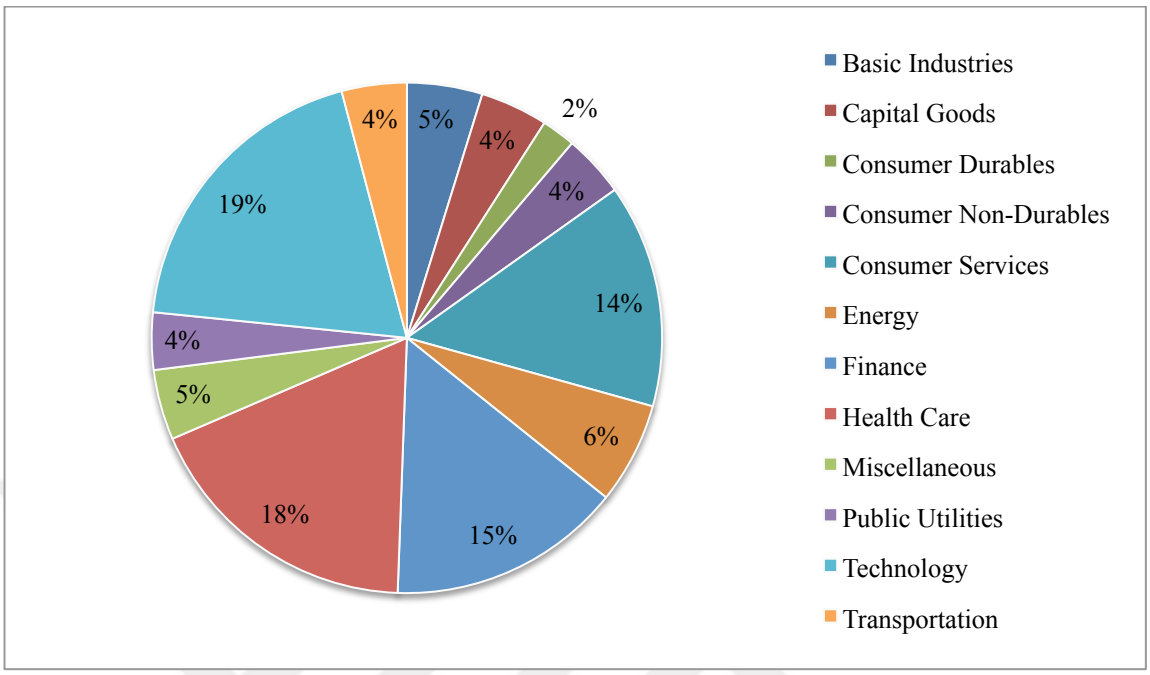

Figure 4-2. Proportion of twelve major industries within NASDAQ and NYSE IPOs in the data set from 2002 to 2010.

4.2 Summary of Chapter

To provide a study that focuses on pre- and post-crisis conditions to the literature, the data was selected from a timeframe that spans from January 1, 2002 to December 31, 2010. The study observed the long-run price performance of all 607 new common stock issues that went public on the NYSE and NASDAQ within this timeframe. Of 1272 total IPOs within the timeframe, 665 public offerings were excluded from the data set on the basis that either they do not fall into the operational definition of first issue company stocks, or they do not have sufficient data for aftermarket performance analysis. Later, observations of the 607 IPOs were grouped into three 3-year timeframes to analyze pre-financial crisis interval and post-financial crisis interval while comparing them with a benchmark.

All data for independent and dependent variables were collected from publicly available resources. The information about share-related decisions, financial and operational maturity indicators, and underwriting professional selections of the issuing firm were collected from United States Securities and Exchange Commission Electronic Data Gathering, Analysis and Retrieval (EDGAR) system. Aftermarket performance data were collected from Bloomberg Professional Service Software and Thomson Reuters DataStream. A majority of the 607 IPOs chose to be listed on NASDAQ; however, the NYSE managed to increase its share in the post-crisis period.

Companies operating in the technology, healthcare, and finance sectors accounted for more than half of the data set. In line with the literature, a great majority of technology and healthcare companies were listed on NASDAQ in the timeframe of the research. However, more finance companies selected NYSE over NASDAQ as their stock exchange.

Chapter 5 – Observations and Analysis

This chapter consists of two sections in order to clarify the full extent of researcher involvement. The Observations section (Section 5.1) structures the collected data with minimal researcher interruption and objectively presents the data without any asserting direction. The latter Analysis section (Section 5.2) first examines the observations, draws parallels between the market data and literature, and then discusses the departures from the norm. The final portion of the Analysis section reports the results of the model.

5.1 Observations

5.1.1 Independent variables.

The offer prices in the data set closely followed the literature. Table 5-1 provides evidence for Lipman's (2000) argument about the majority of offer prices falling within the $10-20 range. Except for the pre-crisis period, a greater majority of IPOs listed on the NYSE chose to be listed within this range, in comparison to NASDAQ listings. Also, the offer prices on the NYSE were considerably higher than NASDAQ offer prices. Even though this is the case, Google, Inc., the most expensive IPO with an $85 offer price, chose to be listed on NASDAQ. As seen in Figure 5-1, the offer prices in the post-crisis decreased below pre-crisis and benchmark periods.

Table 5-1
Offer Price Statistics of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	$14.86	$13.20	$17.79
	Median	$14.00	$13.00	$17.00
	Minimum	$5.25	$5.25	$9.00
	Maximum	$85.00	$85.00	$39.00
	Percentage of offer prices within $10-20 range	70.06%	67.00%	75.44%
Pre-crisis (2005-07)	Mean	$15.34	$13.57	$18.55
	Median	$15.00	$13.00	$18.00
	Minimum	$5.00	$5.00	$10.00
	Maximum	$39.00	$30.01	$39.00
	Percentage of offer prices within $10-20 range	74.28%	76.00%	71.17%
Post-crisis (2008-10)	Mean	$14.18	$12.52	$16.18
	Median	$13.00	$12.00	$14.00
	Minimum	$4.00	$4.00	$8.00
	Maximum	$44.00	$30.00	$44.00
	Percentage of offer prices within $10-20 range	71.94%	71.05%	73.02%
All Data (2002-10)	Mean	$14.95	$13.26	$17.71
	Median	$14.00	$13.00	$17.00
	Minimum	$4.00	$4.00	$8.00
	Maximum	$85.00	$85.00	$44.00
	Percentage of offer prices within $10-20 range	72.65%	72.61%	72.73%

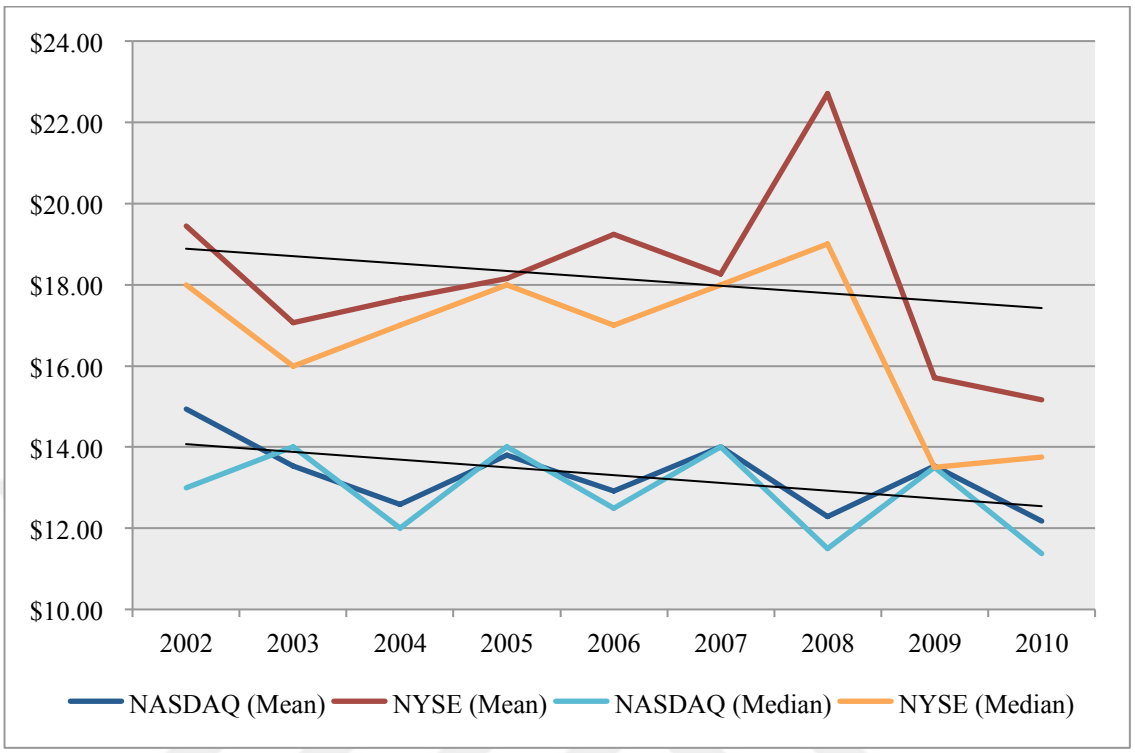

Figure 5-1. Mean and median offer prices of IPOs on the NYSE and NASDAQ from 2002 to 2010.

The offer rate of the IPOs within the data set generally increased over time. The companies that were listed on the NYSE decided to offer more shares than the NASDAQ companies in all periods. Table 5-2 shows that while the NYSE offer rates decreased after the 2008 financial crises, NASDAQ offer rates increased. Interestingly, none of the 311 companies that went public in the pre-crisis period decided to offer less than 10% of its shares.

Table 5-2
Offer Rate of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	30.50%	29.55%	32.17%
	Median	25.71%	25.82%	25.12%
	Minimum	6.79%	7.23%	6.79%
Pre-crisis (2005-07)	Mean	35.31%	31.83%	41.56%
	Median	28.86%	27.60%	31.60%
	Minimum	10.42%	10.65%	10.42%
Post-crisis (2008-10)	Mean	36.61%	35.50%	37.95%
	Median	29.51%	29.35%	29.75%
	Minimum	7.65%	7.65%	10.01%
All Data (2002-10)	Mean	34.36%	31.97%	38.26%
	Median	28.25%	27.60%	29.65%
	Minimum	6.79%	7.23%	6.79%

On average, price-to-earnings ratios are higher for NYSE stocks; therefore, the companies that went public on this stock exchange asked for more with respect to firm earnings. It is observed that the P/E ratios decreased significantly below zero in the post-crisis period, due to companies with net losses. Even though the P/E ratios increased in the post-crisis period, they were still negative on average. However, ratios of new issues in the NYSE with net losses were lower than NASDAQ IPOs in all sample periods. These findings are shown in Table 5-3.

Table 5-3
Price to Earnings Ratios of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	80.21	80.61	79.52
	Median	23.87	22.02	23.95
	Percentage of companies with net loss	33.12%	44.00%	14.04%
Pre-crisis (2005-07)	Mean	31.10	14.68	60.69
	Median	23.08	4.11	28.59
	Percentage of companies with net loss	36.01%	49.00%	12.61%
Post-crisis (2008-10)	Mean	-295.66	-274.99	-320.59
	Median	14.15	12.93	15.86
	Percentage of companies with net loss	36.69%	43.42%	28.57%
All Data (2002-10)	Mean	-31.02	-26.33	-38.65
	Median	20.43	12.93	23.58
	Percentage of companies with net loss	35.42%	46.54%	17.32%

Market capitalizations of the IPOs increased over time. On average, smaller firms decided to go public in the pre-crisis period, while both the median and mean market capitalization of the issuing firms increased after the crisis. The NYSE listed significantly larger firms as Table 5-4 shows. In the year 2008, following the crisis, the market capitalization of the firms increased on average, even if the outlier General Motors' $49.5 billion market capitalization was excluded. Figure 5-2 shows the increasing trend of the median values of new issue market capitalizations and the impact of General Motors IPO on the sample average.

Table 5-4
Market Capitalization of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	$874.8 M	$587.2 M	$1,379.2 M
	Median	$356.6 M	$249.6 M	$892.2 M
	Minimum	$36.8 M	$36.8 M	$135.5 M
	Maximum	$23,053.7 M	$23,053.7 M	$10,167.1 M
Pre-crisis (2005-07)	Mean	$723.0 M	$404.4 M	$1,297.0 M
	Median	$396.1 M	$306.0 M	$896.2 M
	Minimum	$50.2 M	$50.2 M	$83.9 M
	Maximum	$7,963.7 M	$3,758.4 M	$7,963.7 M
Post-crisis (2008-10)	Mean	$1,213.5 M	$525.4 M	$2,043.6 M
	Median	$413.5 M	$295.7 M	$693.0 M
	Minimum	$23.7 M	$23.7 M	$90.2 M
	Maximum	$49,500.0 M	$3,538.3 M	$49,500.0 M
All Data (2002-10)	Mean	$874.6 M	$477.5 M	$1,520.9 M
	Median	$385.7 M	$289.5 M	$800.0 M
	Minimum	$23.7 M	$23.7 M	$83.9 M
	Maximum	$49,500.0 M	$23,053.7 M	$49,500.0 M

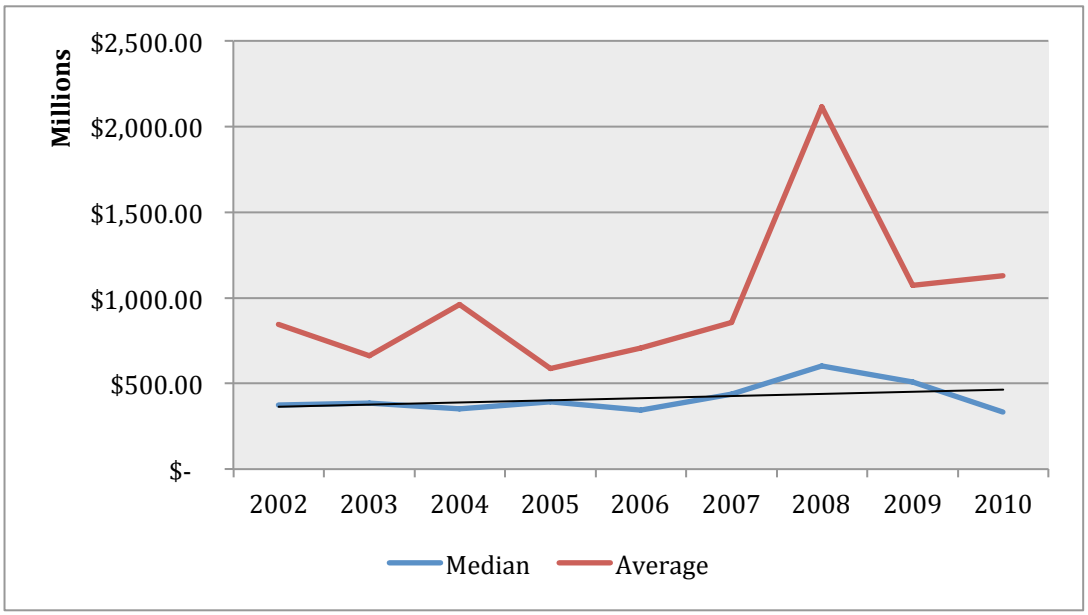

Figure 5-2. The mean and median market capitalization of IPOs on the NYSE and NASDAQ from 2002 to 2010.

The age of IPO-issuing companies were, on average, within one year of each other in the benchmark, pre-crisis and post-crisis periods. Figure 5-3 shows an undulating trend within the timeframe. As the literature suggested, companies that chose the NYSE to be listed were considerably older than NASDAQ companies. The difference between two stock exchanges can be observed in Table 5-5.

Table 5-5
Company Ages of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	22.99	17.16	33.21
	Median	9	8	18
	Maximum	164	113	164
Pre-crisis (2005-07)	Mean	23.18	15.96	36.18
	Median	11	9	22
	Maximum	175	159	175
Post-crisis (2008-10)	Mean	22.19	14.24	31.79
	Median	10	9	13
	Maximum	158	95	158
All Data (2002-10)	Mean	22.90	15.93	34.25
	Median	10	9	18
	Maximum	175	159	175

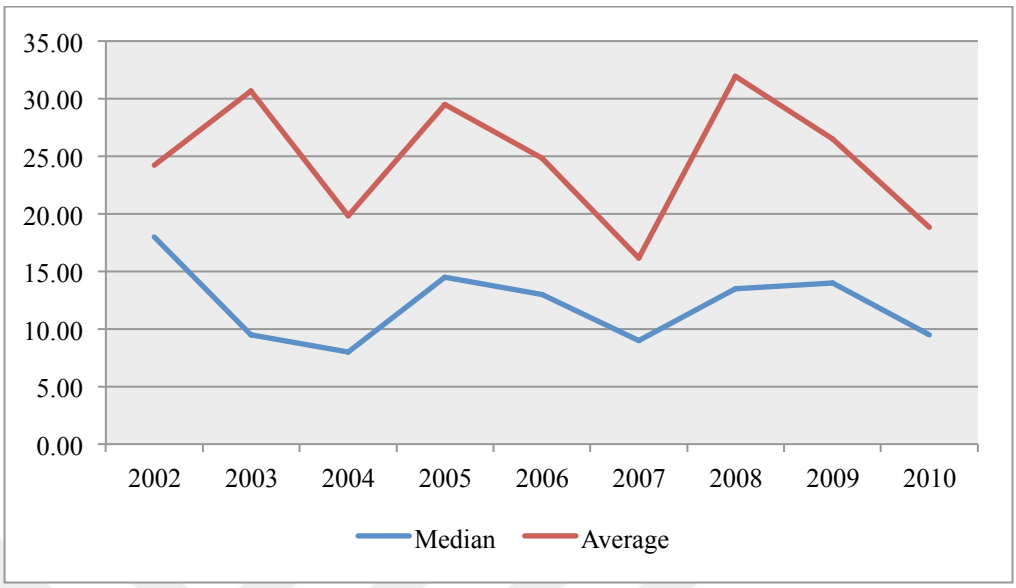

Figure 5-3. The mean and median age of companies that went public on the NYSE and NASDAQ from 2002 to 2010.

In conjunction with the market capitalization and the company ages, the number of employees that issuing firms have, also signals investors about the size of the company. In Table 5-6, it can be seen that average number of employees was the lowest in the pre-crisis period. As expected, firms that went public on the NYSE had significantly larger number of employees, when compared to NASDAQ IPOs.

Table 5-6
Number of Employees of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	2,671	1,487	4,748
	Median	503	259	1,540
	Maximum	61,000	45,000	61,000
Pre-crisis (2005-07)	Mean	1,998	800	4,157
	Median	447	250	1,300
	Maximum	57,000	16,300	57,000
Post-crisis (2008-10)	Mean	8,868	1,638	4,915
	Median	1,100	401	597
	Maximum	209,000	27,539	209,000
All Data (2002-10)	Mean	2,859	1,152	5,588
	Median	489	269	1,350
	Maximum	209,000	45,000	209,000

Table 5-7 shows the profitability measures of the NYSE and NASDAQ IPOs. Across the table, average net profit margins of NASDAQ IPOs were negative, while the firms that went public on the NYSE had positive net profits margins. Average profitability increased with time and it was at the maximum in the post-crisis period. The share of companies without revenue was the highest in pre-crisis period. Also, the first time that the NYSE listed companies without revenue was in the post-crisis period. However, this metric is observed to be consistently lower, across periods, for companies listed on the NYSE. Figure 5-4 shows the trend in profitability in the benchmark, pre-crisis, and post-crisis periods.

Table 5-7
Profitability of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	NPM Mean	-194.09%	-307.06%	4.09%
	NPM Median	2.84%	1.23%	5.30%
	% of companies without revenue	3.82%	6.00%	0.00%
Pre-crisis (2005-07)	NPM Mean	-149.33%	-234.89%	4.84%
	NPM Median	3.24%	0.42%	6.48%
	% of companies without revenue	5.47%	8.50%	0.00%
Post-crisis (2008-10)	NPM Mean	-98.95%	-183.54%	3.08%
	NPM Median	3.77%	2.84%	4.38%
	% of companies without revenue	5.04%	6.58%	3.17%
All Data (2002-10)	NPM Mean	-149.37%	-243.70%	4.18%
	NPM Median	3.12%	1.04%	5.34%
	% of companies without revenue	4.94%	7.45%	0.87%

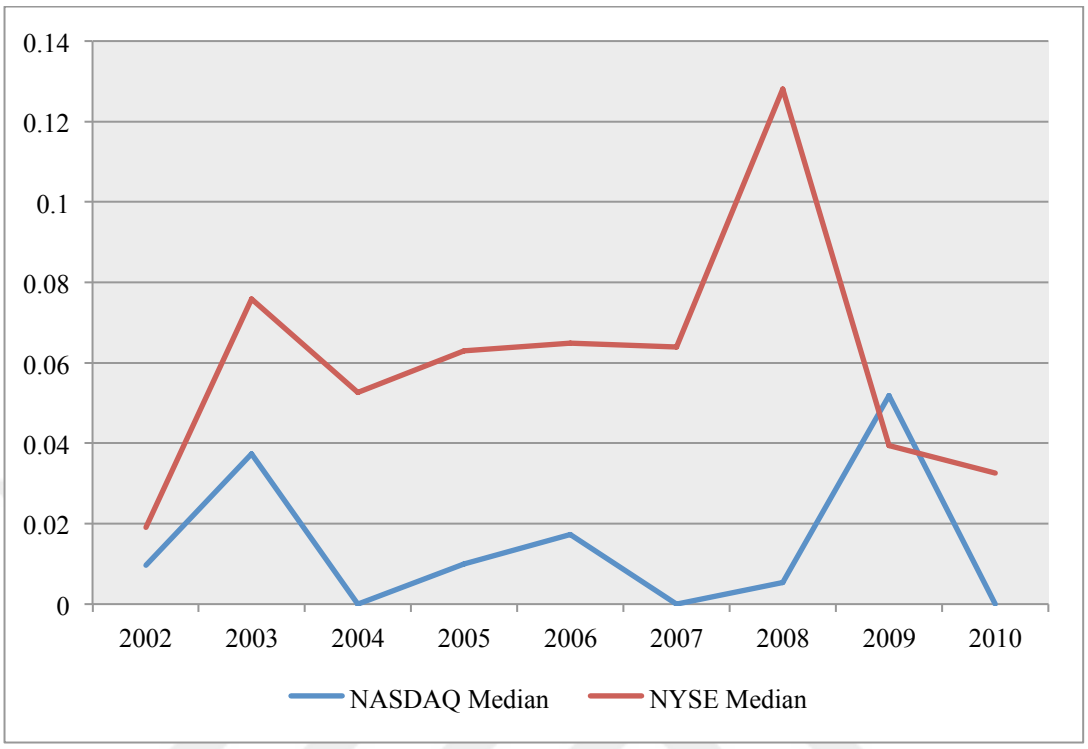

Figure 5-4. The comparison of net profit margin medians on the NYSE and NASDAQ IPOs from 2002 to 2010.

The involvement of reputable underwriting professionals was at higher rates for NYSE IPOs across the table, as seen in Table 5-8. Selecting prestigious independent auditors followed a decreasing pattern over time. Even though the pre-crisis period saw the lowest rates of reputable auditors for NYSE IPOs, this was true for the post-crisis period in NASDAQ IPOs. Prestigious underwriters picked more NASDAQ IPOs in the pre-crisis period, while this period also marked the lowest rate of prestigious underwriters in NYSE IPOs. Figure 5-5 shows the involvement of prestigious lead underwriters and auditors over time.

Table 5-8
Underwriting Decisions of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Rate of prestigious auditors	94.90%	94.00%	96.49%
	Rate of prestigious underwriter	70.06%	57.00%	92.98%
Pre-crisis (2005-07)	Rate of prestigious auditors	85.85%	82.50%	91.89%
	Rate of prestigious underwriter	70.42%	60.50%	88.29%
Post-crisis (2008-10)	Rate of prestigious auditors	83.45%	73.68%	95.24%
	Rate of prestigious underwriter	75.54%	59.21%	95.24%
All Data (2002-10)	Rate of prestigious auditors	87.64%	83.78%	93.94%
	Rate of prestigious underwriter	71.50%	59.31%	91.34%

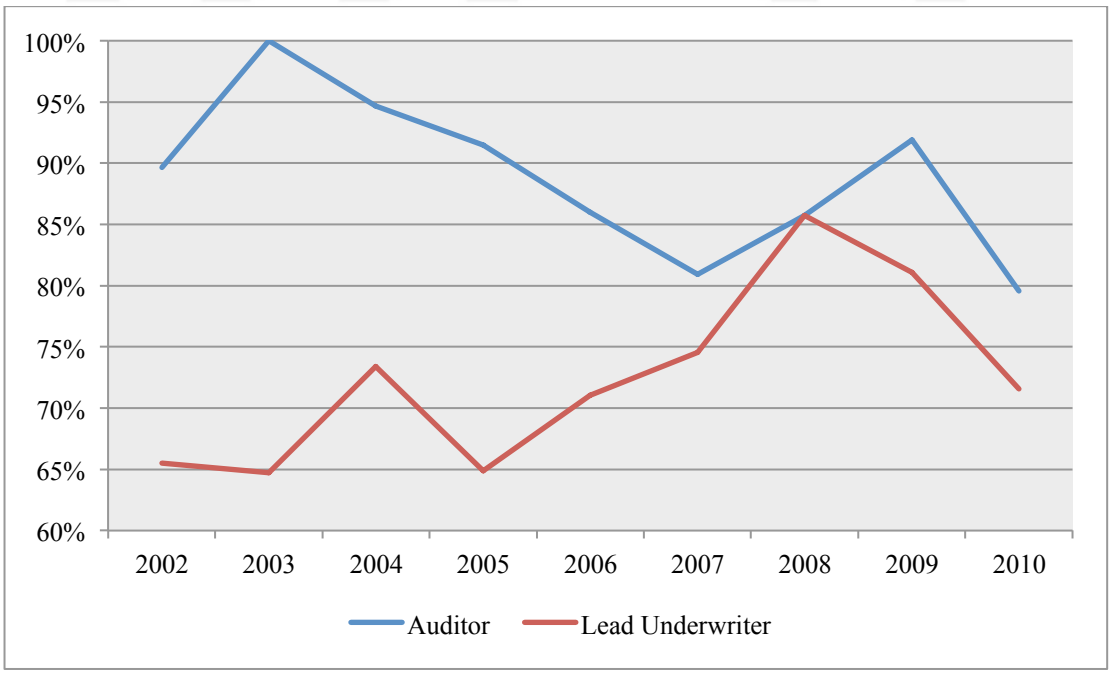

Figure 5-5. The involvement rates of reputable underwriting professionals on the NYSE and NASDAQ IPOs from 2002 to 2010.

5.1.2 Aftermarket price performance.

To measure aftermarket performance, the model used the NYSE Composite Index and the NASDAQ Composite Index as the consistent benchmark for the IPOs listed in their respective indexes. The first day, week, month, quarter, year, second, and third year returns were adjusted for market and economic conditions using this benchmark. In 2002 – 2010 timeframe, the NYSE and NASDAQ Composite Indexes realized positive price performance. Overall, the NYSE Composite Index outperformed the NASDAQ Composite Index. In the benchmark and pre-crisis periods, the NASDAQ Composite Index was the better performer; however, the Index average depreciated in the post-crisis period. The NYSE and NASDAQ Composite Indexes' yearly and periodic performance are listed in Table 5-9. Except for 2002 and 2008, both Indexes enjoyed positive yearly returns. Figure 5-6 displays the daily price performance of the NYSE and NASDAQ Composite Indexes.

Table 5-9
Price Performance of NASDAQ Composite and NYSE Composite Indexes

Sample Period	NASDAQ	NYSE
2002	-19.93%	-32.52%
2003	25.61%	44.66%
2004	12.38%	8.41%
Benchmark	16.11%	9.91%
2005	8.00%	2.47%
2006	15.50%	7.65%
2007	6.65%	9.46%
Pre-crisis	35.66%	23.24%
2008	-40.33%	-39.57%
2009	21.46%	39.02%
2010	8.70%	14.92%
Post-crisis	-17.45%	1.66%
All	27.54%	34.03%

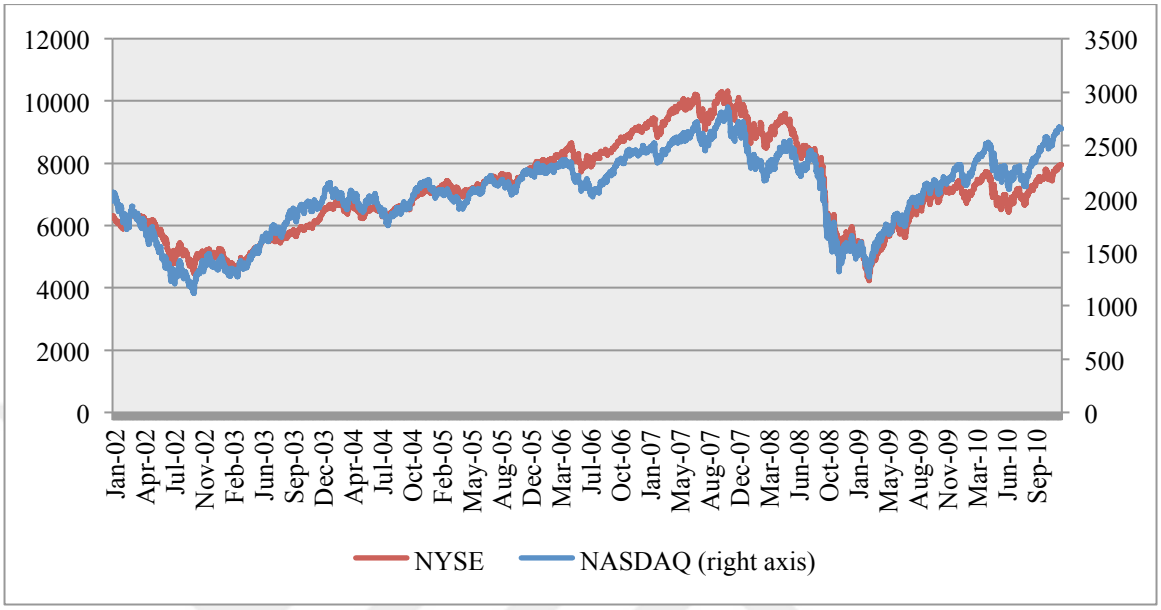

Figure 5-6. Comparison of daily closing price performance of the NYSE Composite Index and the NASDAQ Composite Index from January 1, 2002 to December 31, 2010.

First day market-excess returns of IPOs were similar for the NYSE and NASDAQ in benchmark and post-crisis period. The post-crisis period marked the worst period for the initial price performance of IPOs within the data set. Table 5-10 reports the initial performance of IPOs in the data set. Figure 5-7 shows the yearly initial IPO performance. In all of the data set, initial market-excess returns of NASDAQ IPOs were better than those of the NYSE IPOs.

Table 5-10
First Day Market-Excess Returns of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	1.94%	1.93%	1.97%
	Median	0.77%	1.34%	0.39%
	Minimum	-15.76%	-15.76%	-7.29%
	Maximum	36.98%	36.98%	28.81%
Pre-crisis (2005-07)	Mean	1.96%	2.43%	1.13%
	Median	0.79%	1.32%	0.17%
	Minimum	-29.19%	-29.19%	-20.97%
	Maximum	44.05%	35.40%	44.05%
Post-crisis (2008-10)	Mean	1.51%	1.51%	1.50%
	Median	0.19%	-0.08%	0.37%
	Minimum	-25.83%	-20.20%	-25.83%
	Maximum	53.23%	38.03%	53.23%
All Data (2002-10)	Mean	1.85%	2.11%	1.43%
	Median	0.71%	0.97%	0.25%
	Minimum	-29.19%	-29.19%	-25.83%
	Maximum	53.23%	38.03%	53.23%

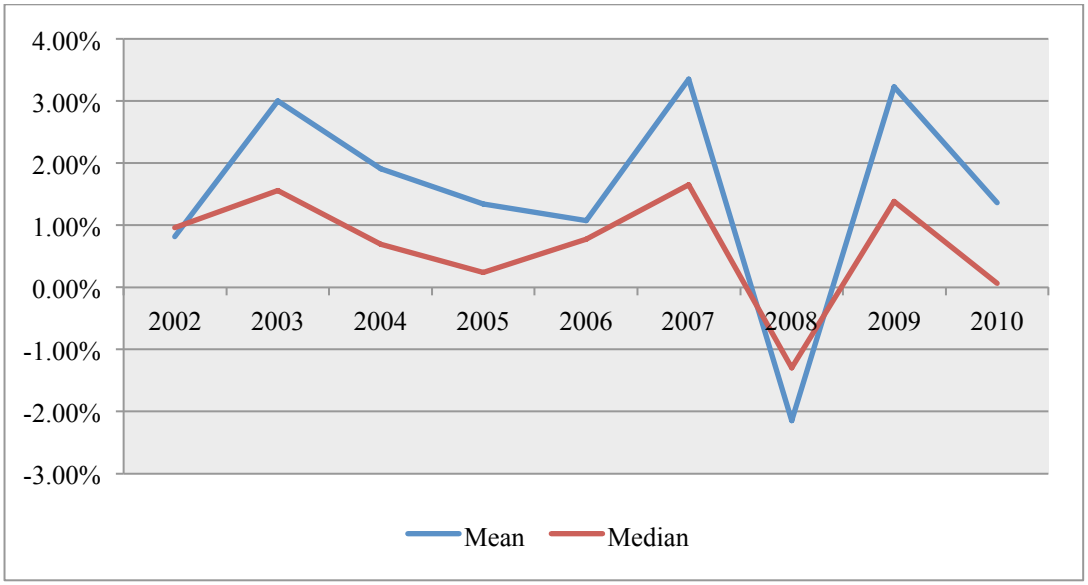

Figure 5-7. Yearly initial market-excess returns of 607 IPOs that went public from 2002 to 2010.

First week market-excess performance of IPOs was at their best in the pre-crisis period. Table 5-11 shows that NASDAQ outperformed the NYSE both before and after the crisis in first week performance of IPOs. Also, the volatility of IPO returns was at a maximum in the post-crisis period. Figure 5-8 shows that 2002 was the worst year for the first week returns, as opposed to 2008 being the worst year for first day returns. In all 607 IPOs, NASDAQ IPOs outperformed NYSE IPOs.

Table 5-11
First Week Market-Excess Returns of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	2.23%	2.14%	2.39%
	Median	0.01%	-0.48%	2.20%
	Minimum	-28.38%	-28.38%	-16.94%
	Maximum	63.42%	63.42%	30.98%
Pre-crisis (2005-07)	Mean	2.76%	3.50%	1.44%
	Median	1.34%	1.95%	0.90%
	Minimum	-49.45%	-49.45%	-33.07%
	Maximum	58.91%	58.91%	50.22%
Post-crisis (2008-10)	Mean	2.29%	2.47%	2.07%
	Median	0.32%	-1.14%	1.29%
	Minimum	-44.73%	-44.73%	-26.12%
	Maximum	70.22%	70.22%	58.92%
All Data (2002-10)	Mean	2.51%	2.93%	1.84%
	Median	0.82%	0.61%	1.11%
	Minimum	-49.45%	-49.45%	-33.07%
	Maximum	70.22%	70.22%	58.92%

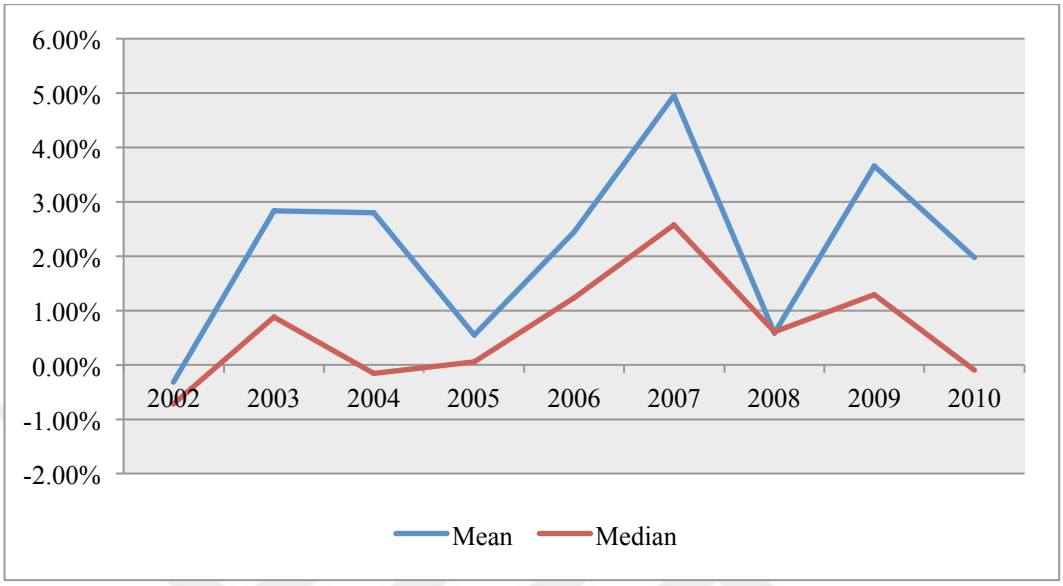

Figure 5-8. Yearly first week market-excess returns of 607 IPOs that went public from 2002 to 2010.

For the first month market-excess returns, the differences between the NYSE and NASDAQ IPOs became clearer. Table 5-12 shows that NASDAQ IPOs outperformed NYSE IPOs in the pre-crisis period; the opposite holds in the post-crisis period. Figure 5-9 shows the declining trend in first month market-excess returns over time. When all IPOs are considered, first month-excess returns of NASDAQ IPOs were larger than NYSE excess returns.

Table 5-12
First Month Market Excess Returns of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	4.73%	4.57%	5.00%
	Median	2.13%	0.70%	4.28%
	Minimum	-27.55%	-27.55%	-16.79%
	Maximum	76.92%	76.92%	32.49%
Pre-crisis (2005-07)	Mean	2.75%	3.82%	0.82%
	Median	1.58%	1.73%	1.11%
	Minimum	-54.50%	-54.50%	-47.02%
	Maximum	54.86%	54.86%	53.96%
Post-crisis (2008-10)	Mean	1.55%	0.23%	3.15%
	Median	0.19%	-0.38%	1.89%
	Minimum	-36.38%	-36.38%	-26.59%
	Maximum	87.46%	87.46%	49.30%
All Data (2002-10)	Mean	2.99%	3.30%	2.49%
	Median	1.43%	0.87%	2.13%
	Minimum	-54.50%	-54.50%	-47.02%
	Maximum	87.46%	87.46%	53.96%

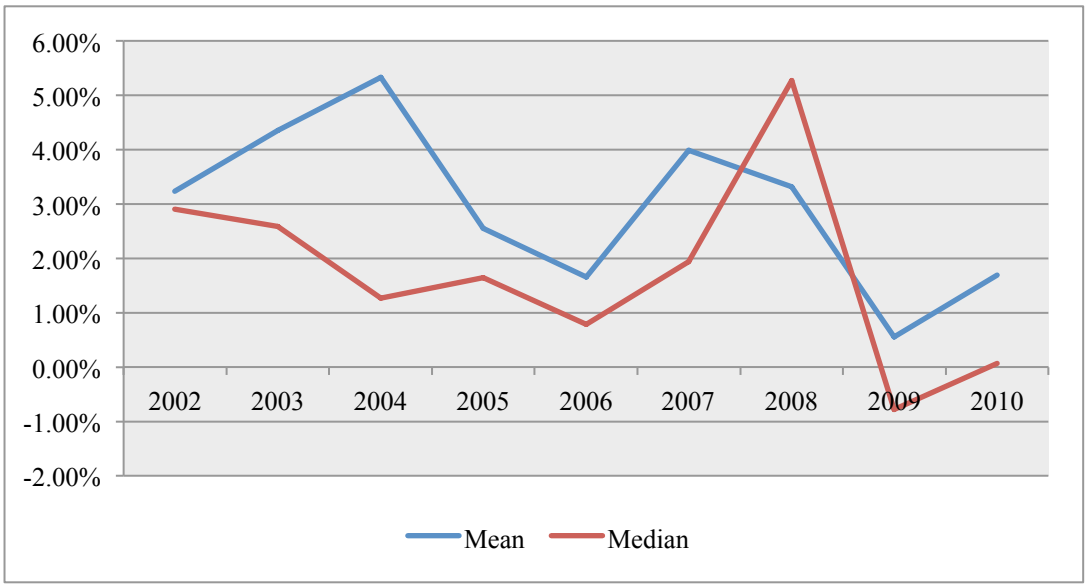

Figure 5-9. Yearly first month market-excess returns of 607 IPOs that went public from 2002 to 2010.

Similar to first month results, NASDAQ IPOs outperformed NYSE IPOs in the pre-crisis period, and NYSE IPOs outperformed NASDAQ IPOs in the post-crisis period in first quarter market-excess returns. The declining trend over time is also apparent in Figure 5-10 with negative average return in 2008. In all 607 IPOs, Table 5-13 reports that NYSE IPOs started to outperform the NASDAQ IPOs in this investment horizon.

Table 5-13
First Quarter Market Excess Returns of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	9.93%	8.72%	12.06%
	Median	5.85%	3.33%	6.69%
	Minimum	-67.22%	-67.22%	-35.22%
	Maximum	161.72%	161.72%	97.64%
Pre-crisis (2005-07)	Mean	6.73%	8.70%	3.20%
	Median	1.97%	3.94%	-0.68%
	Minimum	-61.74%	-61.36%	-61.74%
	Maximum	142.73%	142.73%	89.08%
Post-crisis (2008-10)	Mean	5.34%	-1.19%	13.21%
	Median	-0.45%	-5.91%	9.68%
	Minimum	-54.98%	-54.98%	-41.25%
	Maximum	122.85%	99.94%	122.85%
All Data (2002-10)	Mean	7.24%	6.70%	8.12%
	Median	2.67%	0.56%	3.87%
	Minimum	-67.22%	-67.22%	-61.74%
	Maximum	161.72%	161.72%	122.85%

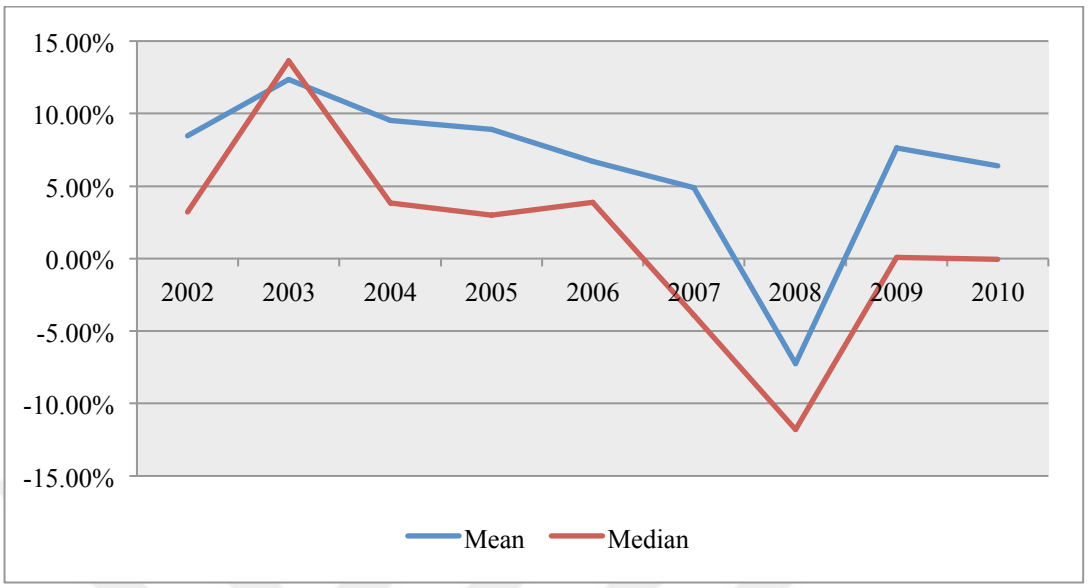

Figure 5-10. Yearly first quarter market-excess returns of 607 IPOs that went public from 2002 to 2010.

The previous pre- and post-crisis patterns of NASDAQ and NYSE IPOs changed with the first year returns. Market-excess returns of NYSE IPOs outperformed NASDAQ IPOs both in the pre- and post-crisis periods. As Table 5-14 shows, the spread between NYSE and NASDAQ IPOs in all 607 IPO's first year market-excess returns is greater than short-term returns. Figure 5-11 reports a similar declining overall trend over time, with 2007 first year market-excess returns turning negative.

Table 5-14
First Year Market Excess Returns of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	15.28%	12.20%	20.67%
	Median	5.92%	7.14%	5.07%
	Minimum	-105.87%	-105.87%	-47.29%
	Maximum	239.45%	239.45%	237.32%
Pre-crisis (2005-07)	Mean	12.97%	12.70%	13.48%
	Median	0.06%	-2.80%	2.56%
	Minimum	-102.69%	-87.36%	-102.69%
	Maximum	774.21%	774.21%	262.60%
Post-crisis (2008-10)	Mean	4.97%	-0.58%	11.67%
	Median	-0.97%	-0.46%	-4.79%
	Minimum	-88.73%	-88.73%	-61.94%
	Maximum	365.62%	339.91%	365.62%
All Data (2002-10)	Mean	11.74%	9.88%	14.76%
	Median	2.46%	0.07%	3.44%
	Minimum	-105.87%	-105.87%	-102.69%
	Maximum	774.21%	774.21%	365.62%

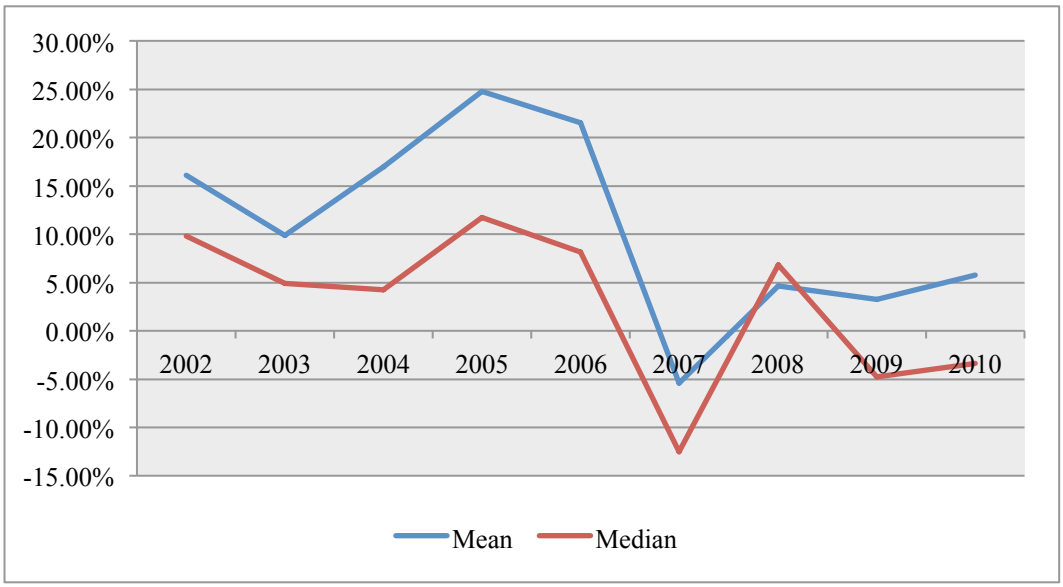

Figure 5-11. Yearly first year market-excess returns of 607 IPOs that went public from 2002 to 2010.

Second year market-excess returns of IPOs reported similar results as the previous long-run return. Table 5-15 shows that NYSE IPOs outperformed NASDAQ IPOs in pre- and post-crisis periods, and in overall. The declining trend over time in Figure 5-12 intensified, with the entire post-crisis period year reporting negative median returns.

Table 5-15
Second Year Market Excess Returns of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	31.16%	30.62%	32.11%
	Median	10.07%	11.74%	0.18%
	Minimum	-95.04%	-95.04%	-68.47%
	Maximum	411.11%	396.96%	411.11%
Pre-crisis (2005-07)	Mean	9.32%	4.11%	18.73%
	Median	-12.70%	-18.10%	0.46%
	Minimum	-104.67%	-97.32%	-104.67%
	Maximum	576.30%	394.44%	576.30%
Post-crisis (2008-10)	Mean	-8.98%	-15.48%	-1.14%
	Median	-20.56%	-21.92%	-19.93%
	Minimum	-119.25%	-119.25%	-97.34%
	Maximum	212.18%	212.18%	129.29%
All Data (2002-10)	Mean	10.78%	7.20%	16.61%
	Median	-8.76%	-12.91%	-0.21%
	Minimum	-119.25%	-119.25%	-104.67%
	Maximum	576.30%	396.96%	576.30%

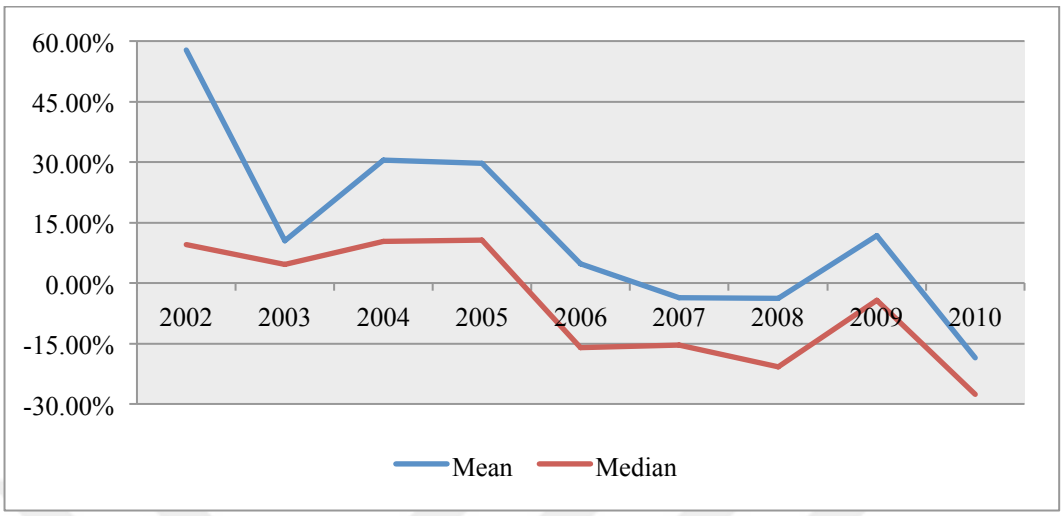

Figure 5-12. Yearly second year market-excess returns of 607 IPOs that went public from 2002 to 2010.

Similar long-run trends can be observed in Table 5-16 with the third year market excess returns. In third year market-excess returns, similar to other long-run results, NYSE IPOs realized better results in both pre-crisis and post-crisis periods.

Table 5-16
Third Year Market Excess Returns of IPOs

Sample Period	Measurement	All Data	NASDAQ	NYSE
Benchmark (2002-04)	Mean	26.52%	26.22%	27.05%
	Median	3.16%	8.32%	-7.99%
	Minimum	-119.57%	-119.57%	-118.36%
	Maximum	760.49%	760.49%	425.07%
Pre-crisis (2005-07)	Mean	6.00%	-0.98%	18.58%
	Median	-12.10%	-18.28%	-3.95%
	Minimum	-106.75%	-106.75%	-99.87%
	Maximum	667.09%	399.09%	667.09%
Post-crisis (2008-10)	Mean	-0.34%	-13.84%	15.94%
	Median	-24.00%	-30.46%	-13.79%
	Minimum	-156.44%	-156.44%	-106.67%
	Maximum	753.12%	753.12%	346.78%
All Data (2002-10)	Mean	9.86%	3.65%	19.95%
	Median	-12.10%	-17.50%	-5.23%
	Minimum	-156.44%	-156.44%	-118.36%
	Maximum	760.49%	760.49%	667.09%

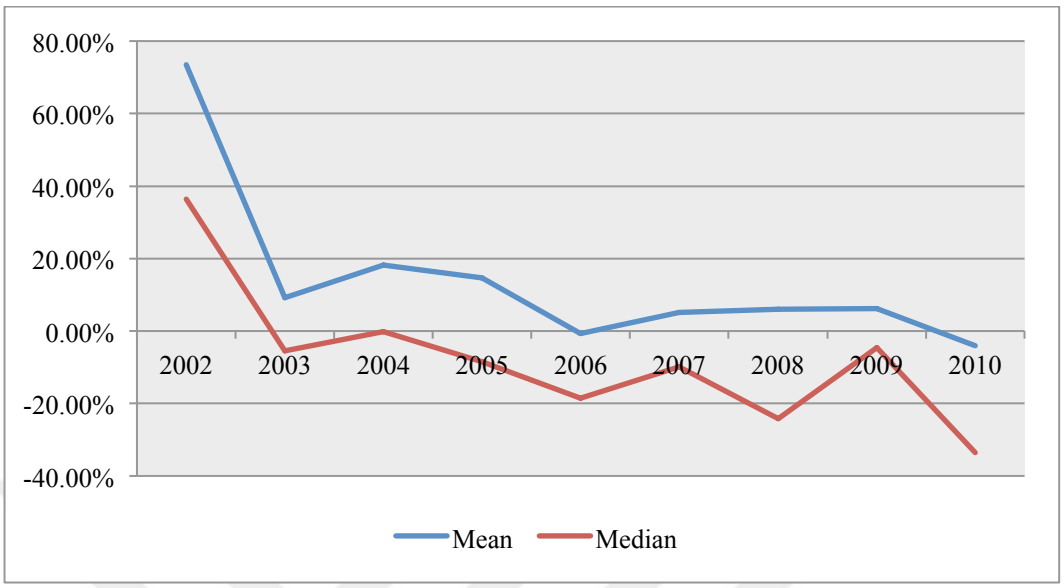

Figure 5-13. Yearly third year market-excess returns of 607 IPOs that went public from 2002 to 2010.

In line with the literature, over 70% of the offer prices were between $10-20 range. Offer prices on the NYSE tend to be higher than NASDAQ IPOs. Also, IPOs listed on the NYSE were found to offer more shares than NASDAQ companies. The financial crisis affected P/E ratios as the companies incurred net losses, and average P/E ratios were negative in both NYSE and NASDAQ IPOs.

The financial crisis also impacted the financial and operational maturity decisions and underwriter selection. The average market capitalization of the firm increased in the post-crisis period as smaller firms refrained from going public. This was also true for younger firms and companies with fewer employees. NYSE IPOs preferred prestigious underwriting professionals more frequently than did NASDAQ IPOs. Their involvement rate increased in NYSE IPOs in post-crisis period, while the rate increased in NASDAQ IPOs in the pre-crisis period.

The comparison indexes produced positive absolute returns except for 2002 and 2008. Overall, the NYSE Composite Index outperformed the NASDAQ Composite Index, but NASDAQ was the better performer in the pre-crisis period. The average initial market-excess return for all 607 IPOs was 1.85%. NASDAQ IPOs were the better performers in the initial run. In the average short-run market-excess returns, NASDAQ IPOs outperformed NYSE IPOs in the pre-crisis period. However, the lead shifted towards NYSE IPOs as the investment horizon increases. In the long-run, average market-excess returns of NYSE IPOs outperformed NASDAQ IPOs in all periods.

The average market-excess return increased with time. Long-run market-excess IPO returns were larger than short-run returns, which outperformed initial returns. NYSE IPOs outperformed NASDAQ IPOs in initial, short-run and long-run market-excess returns in the benchmark period. Also, post-financial crisis period market-excess returns in all horizons were lower than pre-crisis periods. Another aberration is the post-crisis period 3-year market-excess return, which was negative.

5.2 Analysis

5.2.1 Discussing the variables.

Consistent with Lipman's (2000) findings, 72.7% of the offer prices in the entire data set were within the $10-20 price range. Also, Google, Inc.'s $85 offer price may be a sound example supporting Gompers and Mertick (2010)'s view about higher price offerings being associated with prestige. The downward trend and the decrease in post-crisis offer price average may be considered a result of financial crises impact on demand.

The aspects of financial and operational maturity of the new issue include market capitalization, number of employees, age of companies, and profitability, and all of these factors provide support for the argument that NYSE lists larger and more established companies, while younger and promising companies choose to be listed on NASDAQ. However, this decision is also driven by the listing guidelines of the stock exchanges. The changes in these aspects in the pre- and post-financial crisis periods may raise several different arguments. Firstly, the increase in financial and operational maturity in the post-financial crisis period may be explained by the reluctance of smaller and less established companies to go public. The higher investor scrutiny in the post-crisis period and the decrease in investable wealth levels may be the factors preventing these companies from undertaking the IPO process. Alternatively, the decreases in market capitalization, number of employees, and profitability are likely result of the financial crises. The shifts in overall market demand in times of financial crises adversely affect the profitability of firms and motivate companies to downsize. The financial and operational maturity of the post-crisis IPOs may be relatively lower than during other periods as a result of the financial crisis.

The literature was divided about the impact of offer rate on investor perception. Although Short and Keasey (1992) argued that lower offer rates signal shareholder's faith in the company, it may also be an indicator of less marketability (Kiymaz, 2000). Since the underwriters do not favor any unsold shares after the IPO process, some investors may associate lower offer rates as indicative of inferior IPO quality. The market data showed that the average offer rate increases slightly in the post-crisis period and NYSE IPOs were usually offered at higher rates to the public. Also, the offer rate of NYSE IPOs

decreased in the post-crisis period and NASDAQ IPOs acted reciprocally. Therefore, reaching at conclusions solely with market data would not be a sound approach for this variable.

On the other hand, price-to-earnings ratios provide a good example of the demand shifting characteristics of the financial crises. The data clearly showed that post-financial crisis P/E ratios are considerably lower than pre-crises ratios. One explanation for the negative earnings is the previous losses of IPOs. However, this change may also be explained with the shifts in market demand following the crisis. Since financial crises increase uncertainties associated with the market, they decrease investors' appetite for risk (Leoni, 2008). Therefore, risk averse investors' willingness to spend decreases along with the P/E ratios of the IPOs.

The rate of prestigious underwriting professionals increases after the crisis for NYSE IPOs, and this is line with financial crises' impact on perceptions. As financial crises shift investors demand toward safer investments, issuers also seek out more experienced professionals with which to partner up in the IPO process. On the other hand, the increase of reputable underwriter selection in the pre-crisis period may be explained with underwriters' desire to gain market share in a booming industry.

5.2.2 Linear regressions.

The linear model explained in the Research Design and Methodology was applied to the data collected from S-1 Filings, 424(b) Forms, and Bloomberg Professional Service Software. Seven separate dependent variables were tested against 10 independent variables with the benchmark, pre-crisis and post-crisis data set, along with all data, in 28 different equation estimations. The linear regressions were carried out with the ordinary

least squares method, using the White covariance coefficient matrix. The results are summarized in Tables 5-17 through 5-20 and full equation estimations are available in Appendix B.

Table 5-17
OLS Regression Results for All Data (2002 – 10)

Variables	First Day ME Return (RETDAY)	First Week ME Return (RETWEEK)	First Month ME Return (RETMONTH)	First Quarter ME Return (RETQUARTER)	First Year ME Return (RETY1)	Second Year ME Return (RETY2)	Third Year ME Return (RETY3)
Intercept (C)	0.0164	0.0685	-0.0688	0.0163	0.1136	0.3126	-0.6960
	(0.161)	(0.434)	(-0.382)	(0.048)	(0.134)	(0.309)	(-0.552)
Share Price (SHPRICE)	-0.0007	-0.0003	-0.0002	-0.0004	0.0018	0.0187	0.0158
	(-1.139)	(-0.325)	(-0.192)	(-0.136)	(0.228)	(1.663)*	(0.982)
Offer Rate (OFRATE)	-0.0335	-0.0472	-0.0802	-0.1109	-0.2383	-0.0226	-0.1929
	(-1.993)**	(-2.014)**	(-2.764)***	(-1.910)*	(-2.108)**	(-0.112)	(-0.767)
Price to Earnings Ratio (PE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(-1.035)	(-1.167)	(-1.322)	(-1.416)	(-1.504)	(0.095)	(1.132)
Days to Fiscal Year End (FYEDAYS)	0.0000	0.0001	0.0000	0.0002	-0.0002	-0.0001	0.0001
	(0.726)	(1.090)	(0.640)	(2.036)**	(-0.869)	(-0.228)	(0.289)
Stock Exchange (STEX)	-0.0070	-0.0096	-0.0075	0.0032	-0.0042	-0.0412	0.0005
	(-0.752)	(-0.751)	(-0.479)	(0.101)	(-0.055)	(-0.491)	(0.005)
Market Capitalization (LOG(CAPT))	0.0005	-0.0028	0.0044	0.0000	-0.0062	-0.0456	0.0109
	(0.096)	(-0.343)	(0.447)	(-0.001)	(-0.134)**	(-0.810)	(0.151)
Company Age (LOG(1+AGE))	0.0035	0.0065	0.0128	0.0072	0.0540	0.1026	0.0680
	(1.217)	(1.263)	(2.062)**	(0.627)	(2.193)	(3.208)***	(1.395)
Net Profit Margin (PROFIT)	0.0000	-0.0003	-0.0008	0.0006	0.0013	0.0008	0.0012
	(-0.024)	(-1.536)	(-1.692)*	(1.047)	(1.682)*	(0.517)	(0.737)
Auditor Selection (AUDIT)	-0.0074	-0.0013	0.0194	-0.0063	0.0277	0.1639	0.1465
	(-0.499)	(-0.067)	(0.837)	(-0.134)	(0.327)	(1.745)*	(1.093)
Underwriter Selection (UWRITE)	0.0117	0.0110	-0.0221	0.0491	0.0932	0.0694	0.1116
	(1.249)	(0.796)	(-1.242)	(1.480)	(1.468)	(0.879)	(1.025)

R-squared	0.0155	0.0141	0.0240	0.0233	0.0199	0.0405	0.0299
Durbin-Watson statistic	1.9488	1.9474	1.9345	1.9489	2.0142	1.8815	1.9349
Probability (F-statistic)	0.4986	0.5804	0.1497	0.1664	0.2832	0.0058	0.0521

Note. The table shows results of seven linear regressions with ten common independent variables and seven aftermarket performances. The equation estimate includes all 607 IPOs from 2002 – 2010. T-statistics are reported in parentheses. ***, **, and * are significant at 1%, 5% and 10% confidence level respectively.

Table 5-18
OLS Regression Results for the Benchmark Period (2002 – 04)

Variables	First Day ME Return (RETDAY)	First Week ME Return (RETWEEK)	First Month ME Return (RETMONTH)	First Quarter ME Return (RETQUARTER)	First Year ME Return (RETY1)	Second Year ME Return (RETY2)	Third Year ME Return (RETY3)
Intercept (C)	-0.1484	-0.1686	0.2531	0.7601	2.7854	2.7399	3.2973
	(-0.763)	(-0.653)	(0.752)	(1.303)	(2.133)	(1.035)	(1.283)
Share Price (SHPRICE)	-0.0010	-0.0009	0.0000	0.0023	0.0137	0.0324	0.0574
	(-1.588)	(-0.814)	(-0.013)	(0.446)	(1.153)	(2.070)**	(2.833)***
Offer Rate (OFRATE)	-0.0621	-0.0916	-0.1179	-0.1419	-0.1987	0.0618	-0.4615
	(-2.189)**	(-2.112)**	(-1.979)**	(-1.253)	(-0.841)	(0.120)	(-0.836)
Price to Earnings Ratio (PE)	0.0000	0.0000	0.0000	0.0000	-0.0001	-0.0001	0.0001
	(0.725)	(0.395)	(-1.181)	(0.578)	(-1.375)	(-0.317)	(0.503)
Days to Fiscal Year End (FYEDAYS)	0.0001	0.0001	0.0000	-0.0001	-0.0004	-0.0002	-0.0004
	(0.815)	(0.836)	(0.167)	(-0.376)	(-0.964)	(-0.217)	(-0.382)
Stock Exchange (STEX)	-0.0044	0.0021	0.0257	0.0476	0.1168	-0.0171	-0.1681
	(-0.301)	(0.102)	(0.872)	(0.779)	(0.917)	(-0.077)	(-0.604)
Market Capitalization (LOG(CAPT))	0.0089	0.0082	-0.0111	-0.0392	-0.1487	-0.1580	-0.2452
	(0.869)	(0.602)	(-0.612)	(-1.273)	(-2.047)**	(-1.058)	(-1.652)*
Company Age (LOG(1+AGE))	-0.0004	0.0061	0.0049	0.0081	0.0407	0.1227	0.2134
	(-0.068)	(0.779)	(0.453)	(0.420)	(1.026)	(1.489)	(1.710)*
Net Profit Margin (PROFIT)	-0.0002	-0.0011	0.0003	0.0012	0.0028	-0.0033	-0.0017
	(-0.296)	(-1.179)	(0.377)	(1.089)	(1.426)	(-0.479)	(-0.220)
Auditor Selection (AUDIT)	0.0135	0.0429	0.0485	0.0780	0.0113	-0.1297	0.4980
	(0.529)	(1.083)	(0.919)	(1.010)	(0.053)	(-0.307)	(2.445)**
Underwriter Selection	0.0005	-0.0121	-0.0271	0.0473	0.1742	0.0727	0.3098
	(0.029)	(-0.411)	(-0.745)	(0.628)	(1.462)	(0.407)	(1.503)

(UWRITE)							
R-squared	0.0386	0.0397	0.0309	0.0193	0.0550	0.0623	0.1380
Durbin-Watson statistic	2.1441	2.1116	2.0074	1.9309	1.9828	2.1172	2.0468
Probability (F-statistic)	0.8235	0.8084	0.9094	0.9831	0.5823	0.4723	0.0138

Note. The table shows results of seven linear regressions with ten common independent variables and seven aftermarket performances. The equation estimate includes all 157 IPOs from 2002 – 04. T-statistics are reported in parentheses. ***, **, and * are significant at 1%, 5% and 10% confidence level respectively.

Table 5-19
OLS Regression Results for the Pre-Financial Crisis Period (2005 – 07)

Variables	First Day ME Return (RETDAY)	First Week ME Return (RETWEEK)	First Month ME Return (RETMONTH)	First Quarter ME Return (RETQUARTER)	First Year ME Return (RETY1)	Second Year ME Return (RETY2)	Third Year ME Return (RETY3)
Intercept (C)	0.0424	0.1242	-0.1384	-0.5076	-0.6803	0.5264	-2.3301
	(0.251)	(0.470)	(-0.398)	(-0.823)	(-0.367)	(0.353)	(-1.212)
Share Price (SHPRICE)	-0.0011	-0.0003	0.0000	-0.0012	-0.0005	0.0199	-0.0126
	(-0.808)	(-0.164)	(-0.014)	(-0.229)	(-0.045)	(0.989)	(-0.695)
Offer Rate (OFRATE)	-0.0005	-0.0078	-0.0332	0.0293	-0.1012	0.2108	0.3527
	(-0.019)	(-0.186)	(-0.625)	(0.303)	(-0.531)	(0.735)	(0.979)
Price to Earnings Ratio (PE)	0.0000	0.0000	0.0000	0.0000	-0.0001	-0.0001	-0.0001
	(1.372)	(1.341)	(1.622)	(0.677)	(-0.547)	(-0.998)	(-1.292)
Days to Fiscal Year End (FYEDAYS)	0.0000	0.0001	0.0000	0.0002	-0.0002	-0.0001	-0.0001
	(0.763)	(1.283)	(0.423)	(1.154)	(-0.332)	(-0.294)	(-0.266)
Stock Exchange (STEX)	-0.0064	-0.0117	-0.0313	-0.0926	-0.0566	-0.0012	0.0714
	(-0.430)	(-0.578)	(-1.272)	(-1.898)*	(-0.405)	(-0.010)	(0.561)
Market Capitalization (LOG(CAPT))	0.0005	-0.0047	0.0094	0.0292	0.0407	-0.0551	0.1244
	(0.056)	(-0.331)	(0.499)	(0.876)	(0.425)	(-0.692)	(1.222)
Company Age (LOG(1+AGE))	-0.0006	0.0002	0.0123	0.0041	0.0529	0.0824	0.0371
	(-0.139)	(0.024)	(1.225)	(0.224)	(1.333)	(1.989)**	(0.722)
Net Profit Margin (PROFIT)	-0.0001	-0.0004	-0.0013	0.0002	0.0006	0.0013	0.0014
	(-1.473)	(-3.314)***	(-8.898)***	(0.764)	(1.951)**	(3.521)*	(3.539)*
Auditor Selection (AUDIT)	-0.0265	-0.0182	-0.0188	-0.0650	-0.0462	0.0455	-0.1554
	(-1.335)	(-0.742)	(-0.607)	(-1.003)	(-0.372)	(0.404)	(-0.923)
Underwriter Selection	0.0053	0.0039	-0.0369	0.0481	0.0002	0.0843	0.0346
	(0.430)	(0.212)	(-1.477)	(1.087)	(0.002)	(0.839)	(0.292)

(UWRITE)							
R-squared	0.0249	0.0223	0.0453	0.0235	0.0092	0.0421	0.0291
Durbin-Watson statistic	1.8746	1.8764	1.8943	1.9775	1.9803	1.8004	1.9673
Probability (F-statistic)	0.6616	0.7382	0.1688	0.7028	0.9855	0.2204	0.5345

Note. The table shows results of seven linear regressions with ten common independent variables and seven aftermarket performances. The equation estimate includes all 311 IPOs from 2005 – 07. T-statistics are reported in parentheses. ***, **, and * are significant at 1%, 5% and 10% confidence level respectively.

Table 5-20
OLS Regression Results for the Post-Financial Crisis Period (2008 – 10)

Variables	First Day ME Return (RETDAY)	First Week ME Return (RETWEEK)	First Month ME Return (RETMONTH)	First Quarter ME Return (RETQUARTER)	First Year ME Return (RETY1)	Second Year ME Return (RETY2)	Third Year ME Return (RETY3)
Intercept (C)	0.0890	0.1270	0.0018	-0.1642	-1.2270	-3.0254	-4.3608
	(0.457)	(0.465)	(0.003)	(-0.667)	(-1.165)	(-2.460)	(-2.292)
Share Price (SHPRICE)	-0.0013	-0.0010	-0.0034	-0.0026	-0.0224	-0.0180	-0.0328
	(-0.774)	(-0.443)	(-0.718)	(-1.128)	(-2.410)	(-1.476)	(-2.015)
Offer Rate (OFRATE)	-0.0346	-0.0515	-0.1347	-0.0480	-0.0462	0.1698	0.1438
	(-0.943)	(-1.106)	(-1.360)	(-0.968)	(-0.244)	(0.731)	(0.391)
Price to Earnings Ratio (PE)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(-1.738)*	(-1.368)	(-1.647)	(-1.179)	(-0.908)	(0.539)	(1.850)
Days to Fiscal Year End (FYEDAYS)	0.0000	0.0000	0.0007	0.0001	-0.0001	-0.0001	0.0008
	(-0.308)	(-0.234)	(2.628)	(0.571)	(-0.340)	(-0.109)	(0.838)
Stock Exchange (STEX)	-0.0177	-0.0289	0.1181	-0.0148	-0.0461	-0.1068	0.0911
	(-0.871)	(-1.016)	(1.999)	(-0.460)*	(-0.388)	(-0.843)	(0.453)
Market Capitalization (LOG(CAPT))	-0.0055	-0.0074	-0.0069	0.0051	0.0591	0.1370	0.2179
	(-0.514)	(-0.541)	(-0.214)	(0.374)	(0.975)	(2.008)	(2.036)
Company Age (LOG(1+AGE))	0.0139	0.0169	0.0086	0.0165	0.0514	0.0587	-0.0580
	(1.747)*	(1.410)	(0.351)	(1.312)	(1.032)	(1.368)**	(-0.702)
Net Profit Margin (PROFIT)	0.0017	0.0031	0.0057	0.0047	0.0113	0.0138	0.0115
	(2.298)**	(2.176)***	(2.643)***	(1.770)	(1.590)**	(1.394)*	(0.804)*
Auditor Selection (AUDIT)	0.0205	0.0196	0.0244	0.0485	0.1326	0.1834	0.4050
	(0.657)	(0.486)	(0.291)	(1.256)	(1.048)	(1.202)	(0.978)
Underwriter Selection	0.0376	0.0496	0.0631	0.0582	0.3241	0.2286	0.0862
	(1.541)	(1.409)	(0.868)	(1.529)	(2.376)	(1.473)	(0.205)

(UWRITE)							
R-squared	0.0706	0.0652	0.1704	0.1181	0.1324	0.1327	0.0790
Durbin-Watson statistic	2.0638	2.0880	2.0597	2.0874	2.1990	1.8676	1.9071
Probability (F-statistic)	0.4703	0.5423	0.0061	0.0842	0.0438	0.0432	0.3690

Note. The table shows results of seven linear regressions with ten common independent variables and seven aftermarket performances. The equation estimate includes all 139 IPOs from 2008 – 10. T-statistics are reported in parentheses. ***, **, and * are significant at 1%, 5% and 10% confidence level respectively.

5.2.2.1 Statistical validity.

Probability of F-statistics, Durbin-Watson statistics, and R-squared values are included in the summary to test the statistical validity of the linear regressions. P-values of F-statistics tests suggested that the statistical significance of the model increases with the investment horizon as Figure 5-14 shows. Linear models with long-run aftermarket performance as dependent variables were the most robust models for the entire data and benchmark period, whereas the robustness of short-run models were higher in the post-crisis period estimates.

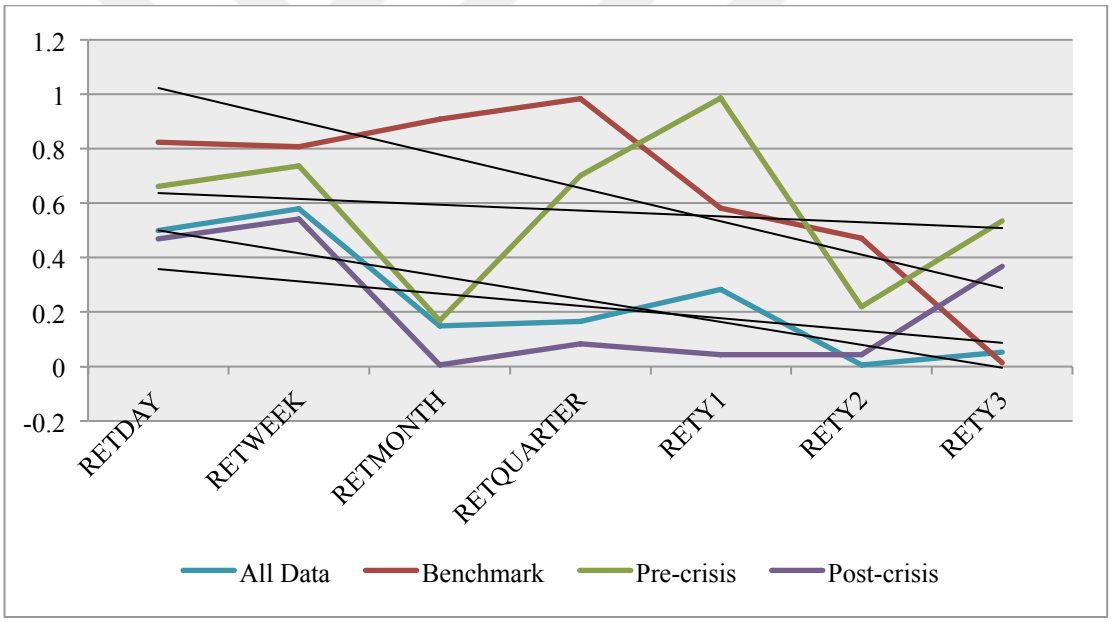

Figure 5-14. The decreasing trend of Probability (F-statistics) over the investment horizon.

A Durbin-Watson statistic close to 2 indicates the absence of autocorrelation. Since all 28 Durbin-Watson statistics were within a 10% spread of 2, the possibility of autocorrelation is very low in the data set. However, R-squared values were relatively low, which suggests that factors other than these independent variables may explain the aftermarket performance. Nevertheless, this point is understandable since the literature

suggested that there are many other factors in the market, which contribute to the aftermarket performance of IPOs.

Along with other fields relying on econometric analysis, most researchers (Chambers, 2009; Dorsman & Guonopoulos, 2013; Ljungqvist & Wilhelm, 2005; Pollock & Gulati, 2007; Roosenboom, 2012) in the IPO field report their results at 1%, 5% and 10% confidence levels and consider these levels as statistically significant. In their seminal work, Barber and Lyon (1997) compared the price performance measurements and showed their significance at 10% confidence level. Since this study used the empirical tests and measurements specified by Barber and Lyon (1997), it reported results at 1%, 5% and 10% confidence levels in line with the literature.

5.2.3 Research question 1.

The main reason for conducting the linear regression was to analyze the relationships between pre-market management decisions and long-run price performance of IPOs on the NYSE and NASDAQ that took place from 2002 to 2010. The results in Table 5-17 previously demonstrated that the relationships between the share price decision, offer rate decision, the decision to go public at a certain market capitalization, the decision to go public at certain company age, prestigious independent auditor selection; and long-run price performance of IPOs are all statistically significant.
The linear regression shows that there was a weakly significant direct relationship between the offering price of IPOs and long-run price performance. Also, the offer rate of IPOs was inversely related to the long-run price performance of IPOs at 5% confidence level. On the other hand, market capitalization exhibited a positive influence on IPO long-run performance at the same level of significance. The analysis yielded a strongly

significant positive relationship between company age and long-run price performance. There was a positive relationship reported for the net profit margin and for the auditor selection at the 10% confidence level. The direction and magnitude of these relationships are summarized in Table 5-21.

Table 5-21
Selected OLS Regression Results for All Data

Variables	Long-run Price Performance
Share Price	1.8%*
Offer Rate	-23.0%**
P/E Ratio	-
Days to Fiscal Year End	-
Stock Exchange	-
Market Capitalization	-0.6%**
Company Age	10.2%***
Net Profit Margin	0.1%*
Auditor Selection	16.3%*
Underwriter Selection	-

Note. ***, **, and * are significant at 1%, 5% and 10% confidence level respectively

5.2.4 Research question 2.

To study the effects of the financial crisis environment on pre-market management decisions and aftermarket performance of IPOs on the NYSE and NASDAQ from 2002 to 2010, the researcher referred to the regressions that observe IPOs in the timeframes preceding and succeeding the financial crisis. Tables 5-18 – 5-20 report these regressions. In the statistically significant data, the financial crisis was found to change the magnitude of the relationship between pre-market decisions and aftermarket performance of IPOs. This point is shown in Table 5-22. The financial crises weakened the impact of the stock exchange decision on short-run market performance at the 10%

level of confidence. As to the long-run IPO performance, the financial crisis weakened the effect of company age.

The effect of the financial crisis is different on the net profit margin – aftermarket performance relationship. The financial crisis environment shifts the indirect relationship between net profit margin and short-run performance to a direct relationship in the post-crisis period. Also, the financial crisis strengthens the influence of profitability on long-run performance.

Table 5-22
Summary of Statistically Significant Regression Results

Variables	Short-run			Long-run		
	Bench-mark	Pre-crisis	Post-crisis	Bench-mark	Pre-crisis	Post-crisis
Share Price						
Offer Rate	-9.1%**			5.7%***		
P/E Ratio						
Days to Fiscal Year End						
Stock Exchange		-9.3%*	-1.5%*			
Market Capitalization				-14.9%**		
Company Age				21.3%*	8.2%**	5.8%**
Net Profit Margin		-0.1%***	0.5%***		0.1%**	1.1%**
Auditor Selection				49.8%**		
Underwriter Selection						

Note. ***, **, and * are significant at 1%, 5% and 10% confidence level, respectively

5.2.5 Research question 3.

In order to investigate the effect of the financial crisis environment on the initial, short-run, and long-run market-excess price performance of IPOs on the NYSE and NASDAQ from 2002 to 2010, the researcher used the aftermarket performance data collected from S-1 Filings, Bloomberg Professional Service Software, and Thomson Reuters Datastream. First, the MAAR model was applied to calculate market-adjusted

initial abnormal returns; the results were reported previously in Table 5-10. For the short-run and long-run market-excess price performance, the CMAAR model was used. The results for the short-run market-excess price performance were reported previously in Tables 5-11 through 5-13 and the long-run results can be found in Tables 5-14 – 5-16.

The initial, short-run, and long-run price performance were constructed into Table 5-23 and plotted on Figure 5-15 to gain a general understanding about the data set. As shown in Table 2-1, the literature suggested that initial positive IPO performance decreases over the investment horizon and turns into underperformance in the long-run. The findings were not fully consistent with the literature, as IPO price performance is found to increase over the investment horizon. Also, the research yielded that NASDAQ IPOs outperformed NYSE IPOs in the initial and early short-run; but NYSE IPOs were the better performers in the long-run.

Table 5-23
Initial, Short-run and Long-run Price Performance of NYSE and NASDAQ IPOs

	Initial	Short-run			Long-run		
	Day	Month	Week	Quarter	Year 1	Year 2	Year 3
All Data	1.85%	2.51%	2.99%	7.24%	11.74%	10.78%	9.86%
NASDAQ	2.11%	2.93%	3.30%	6.70%	9.88%	7.20%	3.65%
NYSE	1.43%	1.84%	2.49%	8.12%	14.76%	16.61%	19.95%

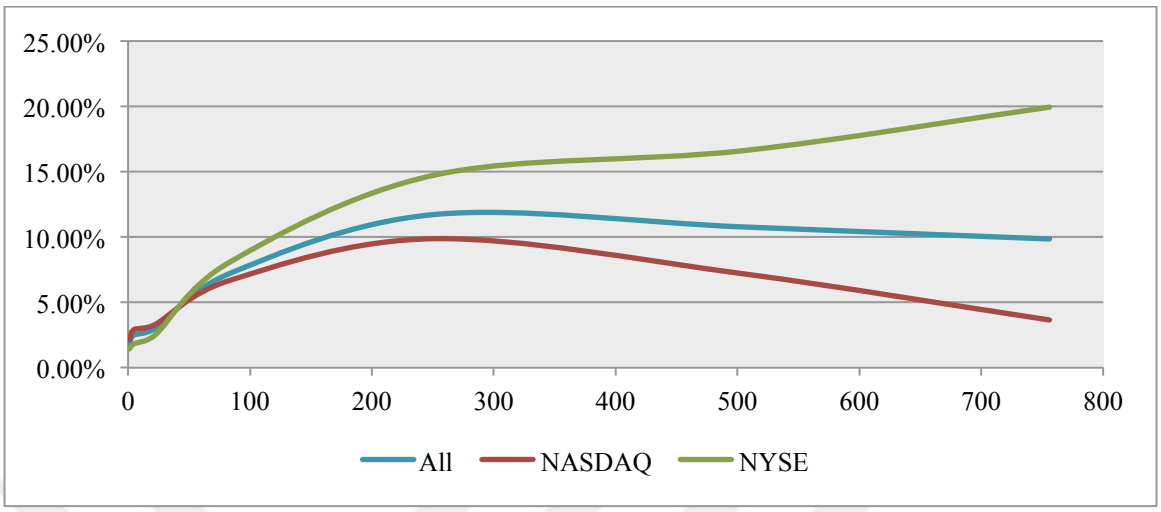

Figure 5-15. IPO price performance of 607 new issues over a three year horizon.

The performance relationship between NASDAQ IPOs and NYSE IPOs were consistent throughout the pre-crisis and post-crisis period. As previously offered in Tables 5-11, 5-13 and 5-14, NYSE IPOs began outperforming NASDAQ IPOs in the long-run during the pre-crisis period and in the late short-run in the post-crisis period. Therefore, the effect of the financial crisis on this relationship is limited. However, Table 5-24 shows that NYSE IPOs consistently outperformed NASDAQ IPOs over the benchmark period. This may be the residual effect of the early 2000s recession in the technology industry, due to the dot-com bubble. As Figure 4-2 previously showed that the prevalence of technology IPOs were higher in the NASDAQ, this underperformance may be associated with the aftermath of dot-com bubble. In this case, this possible bias of the benchmark time period toward NASDAQ IPOs becomes a limitation of this research.

Table 5-24
Initial, Short-run and Long-run Price Performance of NYSE and NASDAQ IPOs Between 2002-04

	Initial	Short-run				Long-run	
	Day	Month	Week	Quarter	Year 1	Year 2	Year 3
NASDAQ	1.93%	2.14%	4.57%	8.72%	12.20%	30.62%	26.22%
NYSE	1.97%	2.39%	5.00%	12.06%	20.67%	32.11%	27.05%

Table 5-25 shows the effects of the financial crisis on the initial, short-run, and long-run price performance of IPOs. The financial crisis was found to consistently decrease the price performance of IPOs in the initial term, short-run, and long-run, except for the first quarter returns. More importantly, it was discovered that the increasing IPO return over the investment horizon was reversed by the financial crisis on Figure 5-16. Moreover, aftermarket performance over the investment horizon in the post-crisis period displayed almost exactly the opposite characteristics as it does during the benchmark period. After the financial crisis, the long-term IPO underperformance seemed to be in better alignment with the literature. From this perspective, the 2008 financial crisis may also be considered a “correction” to the IPO markets as well.

Table 5-25
Initial, Short-run and Long-run Price Performance of IPOs in Crisis Timeframes

	Initial	Short-run			Long-run		
	Day	Month	Week	Quarter	Year 1	Year 2	Year 3
Benchmark (2002-04)	1.94%	2.23%	4.73%	9.93%	15.28%	31.16%	26.52%
Pre-crisis (2005-07)	1.96%	2.76%	2.75%	1.97%	12.97%	9.32%	6.00%
Post-crisis (2008-10)	1.51%	2.29%	1.55%	5.34%	4.97%	-8.98%	-0.34%

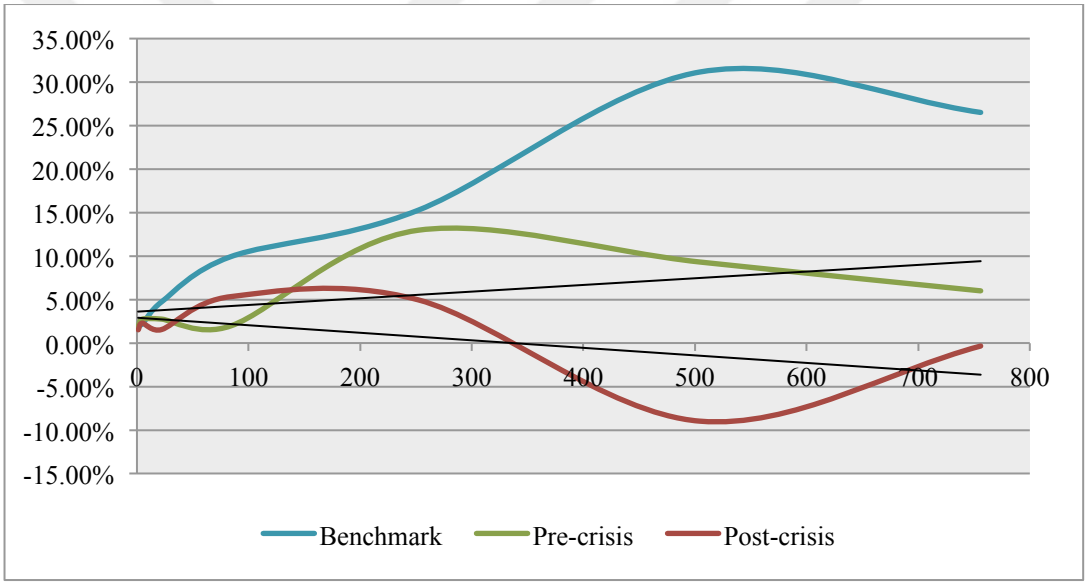

Figure 5-16. The initial, short-run, and long-run performance of IPOs and their trendlines in different timeframes.

Table 5-24 previously established that the financial crisis' influence on the performance relationship between NASDAQ IPOs and NYSE IPOs was considerably limited. However, these IPOs' individual performances in the pre-crisis and post-crisis timeframes were impacted by the financial crisis. As Figure 5-17 depicts, the financial crisis shifted the aftermarket performance of NASDAQ IPOs downwards rather efficiently, without affecting the trend patterns over the investment horizon. However,

this was not the case for NYSE IPOs. The financial crisis augmented the short-term performance, but hindered the long-term performance.

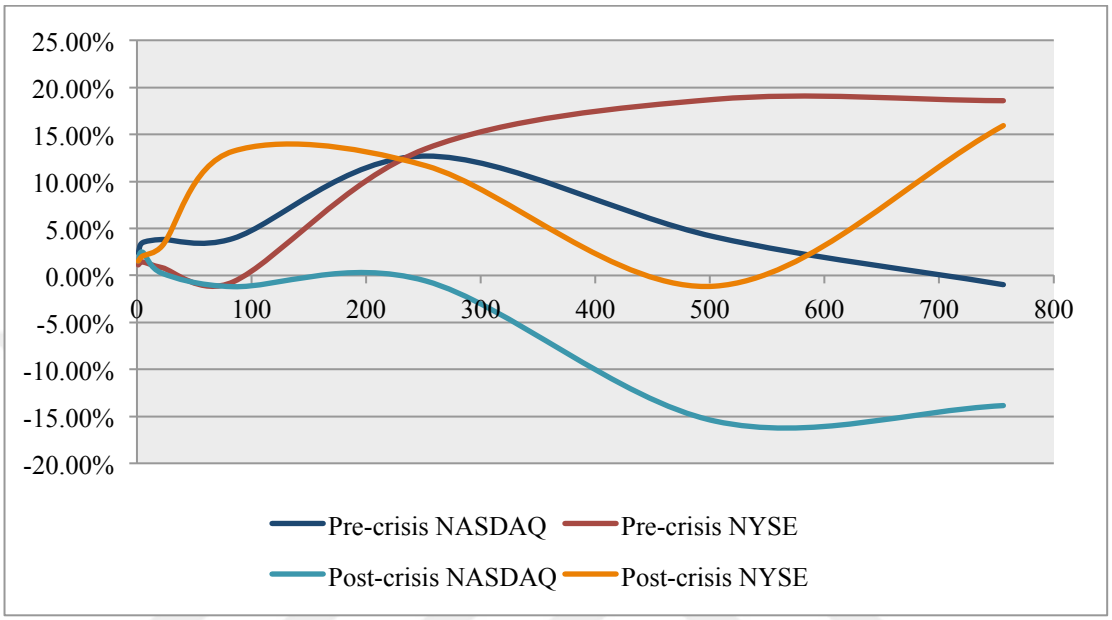

Figure 5-17. Initial, short-run and long-run price performance of NASDAQ and NYSE stocks in the pre- and post-financial crisis conditions.

5.3 Summary of Chapter

This chapter provides the key observations from the data set and analyzes them to answer the research questions and reach conclusions. In line with the literature, the researcher found out that a majority of offer prices fell into the $10-20 range, but the average IPO price declined after the crisis. The offer rate of NYSE IPOS was found to be higher than NASDAQ IPOs and the lowest offer rates were in pre-crisis period. P/E ratios declined after the crisis, as a result of decreases in investors' willingness to pay, as well as declining profit margins.

The NYSE was found to list larger cap firms when compared to NASDAQ, and the increase in average market capitalization after the crisis was interpreted as smaller firms' reluctance to undertake an IPO in the highly uncertain post-crisis market. On

average, older firms chose to be listed more on the NYSE, but there were no clears signs of the financial crisis' impact on this choice. On the other hand, the average number of employees of the IPO-launching firms increased in the post-crisis era. Also, the percentage of companies without revenue was higher in the NASDAQ, and decreased after the crisis. The involvement of reputable underwriting professionals was higher on the NYSE. The rate of prestigious underwriter involvement in IPOs increased after the crisis; however, the issuing companies did not choose to hire prestigious auditors in the post-crisis period as much as the pre-crisis periods.

The prices of the NASDAQ Composite and the NYSE Composite indexes, which are the benchmark indexes, appreciated from 2002 to 2010. The NYSE Composite Index outperformed the NASDAQ Index in the 2002-10 period; however, the NASDAQ Composite was the better performer in pre-crisis period. These indexes were used to measure the value of investing in IPOs in initial term, short-run, and long-run. With linear regressions, the relationship between the pre-market decisions and the value of IPO investments were investigated.

Statistical validity tests confirmed the significance of the linear model and efficiency of the data set. The linear model was utilized to answer the first and second research questions. The regression analysis yielded a positive relationship between the share price, company age, net profit margin, and prestigious auditor selection; and the long-run price performance of IPOs at varying confidence levels between 1% and 10%. On the other hand, the offer rate and market capitalization had a negative influence on the long-run IPO price performance at 5% and 10% confidence levels.

The impact of the crisis on these relationships was tested to answer the second research question. In general, the financial crisis weakened the impact of the stock exchange decision on short-run IPO performance, and the effect of company age on long-run price performance of IPOs. On the other hand, the impact of net profit margin turned positive after the crises.

The initial, short-run, and long-run performance of IPOs in the data set were found to be inconsistent with the majority of studies in the literature. The IPO price performance in the data set increased over the investment horizon, whereas the literature suggested a positive initial performance that declines over the investment horizon and turns into underperformance in the long-run. However, the analysis showed that while the pre-crisis period was consistent with the findings of this research, the post-crisis period was in a better alignment with the literature. This point was noted as the "corrective" aspect of the financial crisis to the IPO markets. Also, the performance relationship between NASDAQ and the NYSE remained unaffected by the financial crisis.

Chapter 6 – Conclusions and Recommendations

This chapter consists of seven sections. The Conclusions section (Section 6.1) combines findings and their analysis to reach at conclusions. Recommendations section (Section 6.2) structures the research's conclusions for the use of issuers, underwriters, investors and market analysts. Summary section (Section 6.3) gives a comprehensive insight about the thesis. Sections 6.4 and 6.5 discuss the originality of the research and it's contribution to the literature. Final two sections list the limitations that the researcher ran into and the researcher's reflections for future studies about this subject.

6.1 Conclusions

The research pointed to three separate conclusions to answer each research question. First, the share price decision, the offer rate decision, the decision to go public at certain market capitalization levels, the decision to go public at a certain company age, the decision to undertake an IPO at certain profitability levels, and the decision to select a prestigious independent auditor all had significant influences over long-run price performance of IPOs on the NYSE and NASDAQ that took place from 2002 to 2010.

Although the majority of offer prices were found to be within the $10-20 range, increasing the share price has positive implications over the long-run price performance of IPOs in these markets within this timeframe. As the offer prices increase, the market demand for the new issue also increases, and this conclusion is in line with the literature that associates higher offer prices with company prestige. The analysis concluded that another share-related decision, the offer rate decision, has a negative effect on the long-run price performance of IPOs. At the 5% confidence level, this provided market evidence for the Short and Keasey (1992) argument on the positive perception of the

higher IPO retention rates. As the private shareholders in the issuing company decide to retain more shares, the long-run price performance increases.

In contrary to the literature, the effect of higher market capitalizations was found to be slightly negative toward the long-run price performance, at the 5% confidence level. However, this point may be more related to the IPOs of troubled large market cap firms in the dataset. The smaller companies decided to suspend or postpone their IPOs in the post-crisis period, while reorganized large market cap firms, including General Motors, decided go public to raise funds.

At the 1% confidence level, there is a positive relationship between the long-run performance of IPOs and company age. In line with the literature, this relationship showed that more established companies have a better chance at realizing positive long-run performance due to higher market demand for established firms than younger companies. Also consistent with the literature, the profitability of the firm has a positive influence on long-run performance. As this data set exhibited, investors relate profitability of the issuer to the quality of the new issue stocks and market demand is higher for these stocks. Last conclusion of the first model was that the decision to select a prestigious independent auditor pays off in the long-run, since there is a positive relationship between auditor prestige and long-run IPO price performance, which was significant at the 10% confidence level.

Second, the 2008 financial crisis was found to impact the magnitude of the relationship between stock exchange listing decisions and short-run IPO performance, and the relationship between company age and long-run price performance of IPOs. The negative impact of decision to be listed on the NYSE before the crisis decreased with the

2008 financial crisis. However, this is only logical since both the NYSE Composite Index and the NYSE IPOs began to outperform the NASDAQ index and IPOs following the crisis. On the other hand, the weakening relationship between company age and long-run price performance of IPOs is not equally intuitive. Since, the risk averse investments increased following the crisis and the company age was associated with less uncertainty, the demand for established firms should follow this logic. Even though the strength of this relationship decreases, it remains positive after the crisis.

More prominently, both in the short-run and long-run, the relationship between net profit margin and the market performance strengthened. In the pre-crisis period, short-run returns were slightly negatively correlated with net profit margin. However, the financial crisis environment not only changed this relationship to positive, but also strengthened the positive relationship between profitability of the firm and long-run IPO performance.

Lastly, the initial, short-run, and long-run market-excess performances of IPOs were found to be positive and in an increasing trend over the investment horizon. Also, the NYSE IPOs have consistently outperformed NASDAQ IPOs in the initial term, short-run, and long-run. This relationship remained unchanged after the financial crisis. However, individual performance of NASDAQ and NYSE IPOs were impacted by the 2008 financial crisis. The initial, short-run, and long-run performance of NASDAQ IPOs showed a uniform pattern across the investment horizon, but the 2008 financial crisis shifted that performance downwards. However, the financial crisis disrupted the previous patterns while reducing the performance of NYSE IPOs.

This research's findings on the initial, short-run, and long-run market-excess performance of IPOs are inconsistent with majority of the studies in the literature. The literature suggested that positive initial performance declines over the investment horizon. Also, the long-run market-excess returns of IPOs were generally negative in the literature. Even though the pre-crisis findings for the initial, short-run, and long-run market-excess performances of IPOs were positive and in an increasing trend over the investment horizon, the post-crisis period performance followed the literature. Therefore, the financial crisis impacted the initial, short-run, and long-run IPO performance patterns to be more consistent with the literature. In other words, the 2008 financial crisis corrected the IPO market's departure from the literature norms.

The findings on the relationship between the pre-market management decisions and the long-run price performance asserted that the right management of the IPO process plays an important role on the aftermarket success of the IPO. By making well-informed share-related decisions, underwriting professional decisions, and deciding on the right operational and financial maturity level to go public, the issuers, underwriters, and auditors can influence the price performance of IPOs.

The impact of 2008 financial crisis on the IPO market was not very different from its impact on the rest of the market. The crisis influenced aftermarket returns of the IPOs and shifted the performance patterns back to the defaults documented in the literature. Similarly, the influence of pre-market management decisions on aftermarket performance changed at times of financial crises. However, the extent of this change was also found to be consistent with changes in investor perceptions.

6.2 Recommendations

IPO-issuing companies, underwriters, investors, auditors, and market researchers may consider adding the findings of this research into their decision-making processes. The research quantified the effects of pre-market management decisions on long-run market-excess price performance under financial crisis conditions. When optimizing share-related decisions, operational and financial maturity at the time of the IPO, and underwriting decisions, these entities may survey the analysis of this research along with the literature. The findings about the impact of offer price, offer rate, market capitalization, company age, profitability and auditor selection on aftermarket IPO performance may be influential for these involved entities in determining pre-market strategies for going public.

Specifically, this research recommends a higher offer price for new issues, and a more mature and profitable company at the time of IPO for better aftermarket performance. Also, it promotes the selection of a prestigious independent underwriter for beneficial long-run price performance. Additionally, it suggests higher share retention rates to benefit long-run IPO performance.

Lastly, it advises that the impact of financial crises shifts the initial, short-run, and long-run price performance downwards. The contrasting shift patterns in the NYSE IPOs and NASDAQ IPOs may be beneficial for involved entities in anticipating the market demand in financial crisis environments. Also, in the future time periods, observing the IPO market's similar departures from the literature norms may be useful in identifying the existence of a pre-crisis period.

6.3 Summary

Initial public offerings (IPOs) are the first sale processes of a private company's common stock to the general public through a stock exchange. IPOs offer instant and low-cost capital to the companies willing to raise capital to expand operations and to shareholders looking to convert ownership into cash. The year 2013 marked the best for IPOs in over a decade in the US equity markets, when 222 companies raised over $54 billion through IPOs (Renaissance, 2014). These 222 companies were admitted be listed in the NYSE or NASDAQ for market trade after they went public.

Planning an IPO involves a long list of critical decisions, since these decisions impact the proceeds from the IPO as well as the aftermarket price performance. Last year, companies were unable to realize $7.42 billion in potential proceeds from IPOs, which accounts for 22% of overall proceeds (Ritter, 2013). These pre-market decisions can be grouped under three categories: share-related decisions, operational and financial maturity of the company, and underwriting decisions.

Pre-market management decisions are considered to be signals by the investor about the quality of the issuing company and its equity. These signals shape the investors' perception about the company, and therefore affect market demand and aftermarket price performance. For share-related decisions, the company partners with underwriters, which identifies the value of shares and handles the sale transactions. They decide on the offering price of the share, share offer rate, initial price-to-earnings ratio, offer date, and the stock exchange on which to list. The decision to go public at a certain market capitalization, age, and profitability level signals the operational and financial maturity of the company, which influences market demand. Also, selecting a prestigious

lead underwriter and a renowned auditor to handle the IPO process signals the quality of the IPO to investors.

In time of financial crises, market demand and investment preferences become distressed (Mishkin, 1992). This distress impacts the price performance of stocks in capital markets, including IPOs (Wu, 2005). The long-run performance of IPOs in high- and low-demand markets has been analyzed (Loughran, Ritter & Rydqvist, 1994); however, the focus of these studies was rarely financial crisis conditions. There are recent studies that documented the effects of the 2008 global financial crisis on European markets (Gunturkun, Gurarda & Erdogan, 2012; Dorsman & Guonopoulos, 2013), but studies on US markets are lagging behind (Henry & Gregoriou, 2014).

This research studied the individual effects of each of these pre-market management decisions on the aftermarket price performance of IPOs in New York's equity markets. Moreover, the study explored the impact of the 2008 financial crisis on the relationship between pre-market management decisions and aftermarket price performance of IPOs. By analyzing and comparing the pre- and post-crisis behaviors of these decision factors in different markets, the study aimed to enrich the literature and provided conclusions about pre-market decisions for issuers, underwriters, investors, and market researchers in time for the next financial crisis.

The research followed a longitudinal quantitative design to understand the effects of share-related decisions, financial and operational maturity decisions, and underwriting decisions. In the research, the data set was limited to the IPOs, which are defined as the first issue company stocks, and therefore excluded the rest of new offerings to the capital markets. All data sources were publicly available and included the United States

Securities and Exchange Commission Electronic Data Gathering, Analysis and Retrieval (EDGAR) system; Bloomberg Professional Service Software; and Thomson Reuters DataStream.

In line with the literature, the research found that a majority of offer prices fall into the $10-20 range, although this average price declined immediately following the crisis. The offer rate of NYSE IPOs was found to be higher than NASDAQ IPOs and the lowest offer rate average was observed in the pre-crisis period. P/E ratios declined after the crisis, as a result of decreases in investors' willingness to pay, as well as profit margins.

The NYSE was found to list larger cap firms when compared to NASDAQ, and the increase in average market capitalization after the crisis is interpreted as smaller firms' reluctance to undertake IPOs in the highly uncertain post-crisis market. On average, older firms chose to be listed more frequently on the NYSE, but there were no clear signs of the financial crisis' impact on this choice. On the other hand, the average number of employees of IPO-issuing firms increased in the post-crisis era. Also, the percentage of companies without revenue was higher among the NASDAQ-listing group; this decreased after the crisis. The involvement of reputable underwriting professionals was higher on the NYSE. The rate of prestigious underwriter involvement in IPOs increased after the crisis; however the rate for auditors fell.

The prices of the NASDAQ Composite Index and NYSE Composite Index, which are the benchmark indexes, appreciated from 2002 to 2010. The NYSE Composite Index outperformed the NASDAQ Index over the 2002-10 period; however, the NASDAQ Composite was the better performer in the pre-crisis period. These indices were used to

measure the value of investing in IPOs in the initial term, short-run, and long-run. With linear regressions, the relationship between pre-market decisions and the value of IPO investments was investigated.

The research found that offer price, offer rate, market capitalization, company age, profitability and auditor selection has an influence on aftermarket IPO performance. Higher share prices positively impacted the long-run performance of IPOs, as the investors associate higher offer prices with the quality of the new issue. Also, the research concluded that the companies that offer less shares in the IPO process have better long-run price performances. Additionally, the company age and profitability of the company was found to positively influence the long-run performance of IPOs. Lastly, the research concluded that selecting a prestigious auditor pays off in the long-run as that selection influences better long-run price performance.

The impact of the financial crisis on these relationships was tested to answer the second research question. In general, the financial crisis weakened the impact of the stock exchange decision on short-run IPO performance and the effect of company age on long-run price performance of IPOs. On the other hand, the impact of net profit margin turned positive after the crisis.

The initial, short-run and long-run performance of IPOs in the data set was found to be inconsistent with the majority of studies in the literature. The IPO price performance in the data set increased over the investment horizon, whereas the literature suggested a positive initial performance that declined over the investment horizon and turned into an underperformance in the long-run. However, the analysis showed that the while the pre-crisis period showed deviations from the literature; the post-crisis period

was in better alignment with the literature. This point was noted as the "corrective" aspect of the financial crisis to the IPO markets. Also, the performance relationship between NASDAQ and the NYSE remained unaffected by the financial crisis.

6.4 Originality

This research provided original evidence for the effects of pre-market management decisions on long-run price performance from a unique timeframe. It discovered relationships between share price decision, offer rate decision, market capitalization, company age, net profit margin, and prestigious auditor selection; and long-run price performance in NYSE and NASDAQ IPOs from 2002 to 2010. The research also concluded that the 2008 financial crisis significantly impacted the magnitude and direction of these relationships in the same markets.

The research pointed out that the 2008 financial crisis decreased the level of initial, short-run, and long-run price performance of IPOs on the NYSE and NASDAQ. It also presented the impact of the 2008 financial crisis on aftermarket performance patterns over a 3-year investment horizon from 2002 to 2010.

6.5 Contribution to the Body of Knowledge

The aim of this research was to broaden the literature with IPO studies capturing the effects of the 2008 financial crisis. The research was designed to serve this purpose and appropriate methodologies were selected to clarify these effects. It presents evidence for the relationship between the pre-market management decisions and the long-run price performance from the NYSE and NASDAQ markets under financial crisis conditions. The evidence for the influence of share price, offer rate, market capitalization, company age, net profit margin, and auditor selection on the long-run price performance of NYSE

and NASDAQ IPOs from 2002 to 2010 is among the contributions of this research. The changes in these relationships under the 2008 financial crisis conditions are also documented in this research, which presents evidence of the 2008 financial crisis' impact on the IPO markets.

Similarly, the research reported initial, short-run, and long-run price performance of IPOs on NASDAQ and the NYSE from 2002 to 2010. This is a new addition of market evidence to the IPO literature on IPO returns. However, more prominently, the conclusion demonstrated that the financial crisis pushes the initial, short-run, and long-run performance of IPOs to realign with the literature norms.

6.6 Limitations

One major limitation of this research was discovered following the observations phase. The underperformance of NASDAQ IPOs in the benchmark period was associated with the residual effects of the dot-com bubble. The high frequency of technology IPOs in the NASDAQ data set resulted in the better performance of NYSE IPOs. For the analysis and conclusion, the comparisons between pre- and post-crisis periods were limited to each other. Not comparing these periods with a consistent benchmark prohibited the researcher from discovering trends that influence both periods.

Another limitation was documented following the statistical validity test of the linear regressions. Lower r-squared values suggested that there were factors other than the independent variables in the linear model that explain aftermarket performance of IPOs. Although this was a foreseen limitation due to the vast number of factors in the market, which contribute to the aftermarket performance of IPOs, it limited the ability of the research to generalize the relationships between pre-market management decisions

and long-run price performance beyond this timeframe and markets.

6.7 Scope for Future Research

Future researchers may look into other operational and financial maturity factors to explain the aftermarket performance of IPOs. These factors may be better contributors to the aftermarket performance and result in more statistically robust results. Adding the number of employees and debt ratios may lead to the discovery of new relationships between pre-market company maturity and aftermarket performance.

Similarly, testing the effect of the offer price with a dummy variable that studies the effects of pricing outside the $10-20 range may be more explanatory of aftermarket performance. Similar to the literature, this research observed the frequency of offerings within this range. The aftermarket performance of firms that price outside this range may be another field of research.

Also, the time horizon of this research may be extended to the 2011-2013 period, in order to study the effects of the recovery period. Since the long-run aftermarket performance analysis requires 3 years of operation, this period will become researchable with the end of the year 2016. Furthermore, this study can be replicated in the future financial crises to strengthen the significance of the conclusions of this research. This replication may result in generalization of the research's conclusions for the behavior of IPO markets in financial crisis settings.

6.8 Summary of Chapter

The research yielded three separate conclusions to answer each research question. Firstly, the share price decision, the offer rate decision, the decision to go public at certain market capitalization levels, the decision to go public at a certain company age,

the decision to undertake an IPO at certain profitability levels, and the decision to select a prestigious independent auditor all had significant influences over long-run price performance of IPOs on the NYSE and NASDAQ that took place from 2002 to 2010. Secondly, the 2008 financial crisis impacted the magnitude of the relationship between stock exchange listing decisions and short-run IPO performance, and the relationship between company age and long-run price performance of IPOs. Thirdly, the initial, short-run, and long-run market-excess performances of IPOs were found to be positive and in an increasing trend over the investment horizon.

This research's findings on the initial, short-run, and long-run market-excess performance of IPOs are inconsistent with majority of the studies in the literature. However, this inconsistency is only correct for pre-financial crisis periods; in the post-financial crisis period, these performances return to literature norms. Therefore, the research also found out that 2008 financial crisis corrected the IPO market's departure from the literature norms.

The research provided recommendations for IPO-issuing companies, underwriters, investors, auditors, and market researchers to use in their decision-making processes. A higher offer price for new issues, higher retention rates and a more mature and profitable company at the time of IPO for better aftermarket performance are among these recommendations. Also, it promotes the selection of a prestigious underwriter for beneficial long-run price performance. Lastly, it advises that the impact of financial crises shifts the initial, short-run, and long-run price performance downwards.

Discovering the relationships between share price decision, offer rate decision, market capitalization, company age, net profit margin, and prestigious auditor selection;

and long-run price performance in a unique timeframe is the primary original component of this research. As a result of this timeframe selection, the research documented the impact of the 2008 financial crisis on the magnitude and direction of these relationships and the overall IPO market performance. These points are also the contributions of the research to the body of knowledge.

The major limitation that the research faced was the residual effects of the dot-com bubble in the benchmark period. Since, the data set included a high frequency of technology IPOs, these effects prohibited the researcher from comparing the periods to a consistent benchmark. Also, there were minor statistical validity issues, which were foreseen.

For future studies, the researcher suggests adding the number of employees and debt ratios to discover new relationships between pre-market company maturity and aftermarket performance. Also, tailoring the offer price variable according to the findings of this research was proposed for future reference. In order to overcome the previously stated major limitation, the researcher submits extending the data set to 2011-2013 period, in order to study the effects of the recovery period. However, since the long-run aftermarket performance analysis requires 3 years of operation, this period will become researchable with the end of the year 2016. Also, replication of the study after the next financial crisis may result in generalization of the research's conclusions for the behavior of IPO markets in financial crisis settings.

References

Aggarwal, R. K., Krigman, L., & Womack, K. L. (2002). Strategic IPO underpricing, information momentum, and lockup expiration selling. *Journal of Financial Economics*, *66*(1), 105-137. doi: 10.1016/S0304-405X(02)00152-6

Aggarwal, R., & Rivoli, P. (1990). Fads in the initial public offering market? *Financial Management*, *19*(4), 45-57. doi: 10.2307/3665609

Aggarwal, R., Leal, R., & Hernandez, L. (1993) The aftermarket performance of initial public offerings in Latin America. *Financial Management*, *22*(1), 42-53. doi: 10.2307/3665964

Aggarwal, R., & Conroy, P. (2000) Price discovery in initial public offerings and the role of the lead underwriter. *The Journal of Finance*, *55*(6), 2903-2922. doi: 10.1111/0022-1082.00312

Allen, F., & Faulhaber, G.R. (1989) Signaling by underpricing in the IPO market. *Journal of Financial Economics 23*(2), 303-323. doi: 10.1016/0304-405X(89)90060-3

Alvarez, S., & Gonzalez, V. M. (2005) Signaling and the long-run performance of Spanish initial public offerings. *Journal of Business Finance & Accounting*, *32*(1-2), 325-350. doi: 10.1111/j.0306-686X.2005.00596.x

Babich, V., & Sobel, M. J. (2004) Pre-IPO operational and financial decisions. *Management Science*, *50*(7), 935-948. doi: 10.1287/mnsc.1040.0252

Barber, B. M., & Lyon, J. D. (1997) Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics*, *43*(3), 341-372. doi: 10.1016/s0304-405X(96)00890-2

Benveniste, L. M., & Spindt, P. A. (1989) How investment bankers determine the offer price and allocation of new issues. *Journal of Financial Economics*, *24*(2), 343-361. doi: 10.1016/0304-405X(89)90051-2

Bochner, S. E., & Avina, J. C. (2010) *Guide to the initial public offering* (7th ed.). Minnesota: Merrill Corp.

Booth, J. R., & Chua, L. (1996) Ownership dispersion, costly information and IPO underpricing. *Journal of Financial Economics*, *41*(2), 291-310. doi: 10.1016/0304-405X(95)00862-9

Booth, J. R., Booth-Chua, L., & Deli, D. (2010) Choice of underwriters in initial public offerings. *Journal of Business and Policy Research*, *5*(2), 131-158. Retrieved from http://www.jbprpapers.com/uploads/2010/december/9.pdf

Bruton, G. D., & Prasad, D. (1997) Strategy and IPO market selection: Implications for the entrepreneurial firm. *Journal of Small Business Management*, *35*(4), 1-10. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=9712116737&site=ehost-live

Carter, R.B., Dark, F.H., & Singh, A. K. (1998) Underwriter reputation, initial returns and the long-run performance of IPO stocks. *The Journal of Finance*, *53*(1), 285-311. doi: 10.1111/0022-1082.104624

Carter, R., & Manaster, S. (1990) Initial public offerings and underwriter reputation. *The Journal of Finance*, *45*(4), 1045-1067. doi: 10.1111/j.1540-6261.1990.tb02426.x

Cusumano, M.A. (2012) Reflecting on the Facebook IPO. *Communication of the ACM*, *55*(10), 20-23. doi: 10.1145/2347736.2347744

Chahine, S. (2008) Underpricing versus gross spread: New evidence on the effect of sold share at the time of IPOs. *Journal of Multinational Financial Management*, *18*(2), 180-196. doi: http://10.1016/j.mulfin.2007.08.001

Chambers, D., & Dimson, E. (2009) IPO underpricing over the very long run. *The Journal of Finance*, *64*(3), 1407-1443. doi: 10.1111/j.1540-6261.2009.01468.x

Chambers, D. (2009) Gentlemanly capitalism revisited: A case study of the underpricing of initial public offerings on the London stock exchange, 1946-86. *The Economic History Review*, *62*(1), 31-56. doi: 10.1111/j.1468-0289.2008.00457.x

Chan, K., Wang, J., & Wei, K. C. J. (2004) Underpricing and long-term performance of IPOs in China. *Journal of Corporate Finance*, *10*(3), 409-430. doi: 10.1016/S0929-1199(03)00023-3

Chemmanur, T. J., He, S., & Nandy, D. K. (2010) The going-public decision and the product market. *The Review of Financial Studies*, *23*(5), 1855-1908. doi: 10.1093/rfs/hhp098

Clarkson, P. (1994) The underpricing of initial public offerings, ex ante uncertainty, and proxy selection. *Accounting and Finance*, *34*(2), 67-78. doi: 10.1111/j.1467-629X.1994.tb00270.x

Cooper, D. R., & Schindler, P.S. (2014) *Business Research Methods* (12th ed.) New York: McGraw-Hill Irwin.

Dorsman, A., & Gounopoulos, D. (2013) European sovereign debt crisis and the performance of Dutch IPOs. *International Review of Financial Analysis*, *30*, 308-319. doi: 10.1016/j.irfa.2013.07.003

EY Global Limited (2013). *EY global IPO trends Q4 2013*. Retrieved from http://www.ey.com/Publication/vwLUAssets/EY_-_Global_IPO_Trends_Q4_2013/$FILE/EY-Global-IPO-Trends-Q4-2013.pdf

Fama, E. F. (1970) Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*, *25*(2), 383-417. doi: 10.1111/j.1540-6261.1970.tb00518.x

Fernando, C. S., Krishnamurthy, S., & Spindt, P. A. (2004) Are share price levels informative? Evidence from the ownership, pricing, turnover and performance of IPO firms. *Journal of Financial* Markets, 7(4), 377-403. doi: 10.1016/j.finmar.2004.01.001

Field, L. C. (1995) Is institutional investment in initial public offerings related to long-run performance of these firms? *Anderson Graduate School of Management, UCLA Recent Papers*. Retrieved from http://escholarship.org/uc/item/1136n8ps

Friend, I., Longstreet, J. R., Mendelson, M., Miller, E., & Hess, A. D. (1967) *Investment Banking and the New Issues Market*. Cleveland: World Publishing.

Florin, J., & Simsek, Z. (2007) The effects of moral hazard and adverse selection on the pricing and underpricing of initial public offerings. *Venture Capital: An International Journal of Entrepreneurial Finance*, *9*(2), 127-143. doi: 10.1080/13691060601098115

Freitas, A. P. N, Savoia, J. R. F., & Montini A. A. (2008) The aftermarket performance of initial public offerings: The Brazilian experience. *Latin American Business Review*, *8*(4), 97-114. doi: 10.1080/10978520802114797

Gompers, P. A., & Metrick, A. (2001) Institutional investors and equity prices. *The Quarterly Journal of Economics*, *116*(1), 229-259. doi: 10.1162/003355301556392

Gunturkun, M. H., Gurarda, S., & Erdogan, H. H. (2012) Impact of macroeconomic factors on underpricing of initial public offerings before and after the recent global financial crisis: Evidence from Istanbul Stock Exchange. *Journal of Applied Finance & Banking*, *2*(5), 261-273. Retrieved from: www.scienpress.com/journal_focus.asp?main_id=56&Sub_id=IV&Issue=389

Hamdi, H., Nguyen, D. K., & Obeid, H. (2013) The short- and long-term performance of privatization initial public offerings in Europe. *Journal of Applied Business Research*, *29*(4), 1189-1198. Retrieved from http://journals.cluteonline.com/index.php/JABR/article/view/7925

Henry, S., & Gregoriou, G. N. (2013) IPO firm characteristics pre- and post-financial crisis. *Academy of Accounting and Financial Studies Journal*, *18*(2), 67-76. doi: 10.2139/ssrn.2292307

Higgins, M. C., & Gulati, R. (2003) Getting off to a good start: The effects of upper echelon affiliations on underwriter prestige. *Organization Science*, *14*(3), 244-263. doi: 10.1287/orsc.14.2.244.15160

Holland, K. M., & Horton, J. G. (1993) Initial public offerings on the unlisted securities market: The impact of professional advisers. *Accounting and Business Research*, *24*(93), 19-34. doi: 10.1080/00014788.1993.9729461

Ibbotson, R. (1975) Price performance of common stock new issues. *Journal of Financial Economics*, *2*(3), 235-272. doi: 10.1016/0304-405X(75)90015-X

Jain, B. A., & Martin, C. L. (2005) The association between audit quality and post-IPO performance: A survival analysis approach. *Review of Accounting & Finance*, *4*(4), 50-75. doi; 10.1108/eb043437

Jain, B. A., & Nag, B. N. (1996) A decision-support model for investment decisions in new ventures. *European Journal of Operational Research*, *90*(3), 473-486, doi: 10.1016/0377-2217(95)00154-9

Jog, V., & McConomy, B. J. (2003) Voluntary disclosure of management earnings forecasts in IPO prospectuses. *Journal of Business Finance & Accounting*, *30*(1-2), 125-168. doi: 10.1111/1468-5957.00486

Koh, F., & Walter, T. (1989) A direct test of Rock's model of the pricing of unseasoned issues. *Journal of Financial Economics*, *23*(2), 251-272. doi: 10.1016/0304-405X(89)90058-5

Kothari, S. P., & Warner, J. B. (1997) Measuring long-horizon security price performance. *Journal of Financial Economics*, *43*(3), 301-339. doi: 10.1016/S0304-405X(96)00899-9

Keloharju, M. (1993) The winner's curse, legal liability and the long-run price performance of initial public offerings in Finland. *Journal of Financial Economics*, *34*(2), 251-277. doi: 10.1016/0304-405X(93)90020-C

Kiymaz, H. (2000) The initial and aftermarket perfomances of IPOs in an emerging market: Evidence from Istanbul stock exchange. *Journal of Multinational Financial Management*, *10*(2), 213-227. doi: 10.1016/S1042-444x(99)00027-4

Kliger, D., Gurevich, G., & Haim, A. (2012) When chronobiology met economics: Seasonal affective disorder and the demand for initial public offerings. *Journal of Neuroscience, Psychology, and Economics*, *5*(3), 131-151. doi: 10.1037/a0029473

Leoni, P. (2008) A market microstructure explanation of IPOs underpricing. *Economic Letters*, *100*(1), 47-48. doi: 10.1016/j.econlet.2007.10.029

Levis, M. (1990). The winner's curse problem, interest costs and the underpricing of initial public offerings. *The Economic Journal*, *100*(399), 76-89. doi: 10.2307/2233595

Levis, M. (1993). The long-run performance of initial public offerings: The UK experience 1980-88. *Financial Management*, *22*(2), 28-41. doi: 10.2307/3665963

Lipman, F. D. (2000) *The Complete Going Public Handbook*. Roseville: Prima Publishing.

Ljungqvist, A. (1997) Pricing initial public offerings: Further evidence from Germany. *European Economic Review*, *41*(7), 1309-1320. doi: 10.1016/S0014-2921(96)00035-9

Ljungqvist, A., Nanda, V., & Singh, R. (2006) Hot markets, investor sentiment, and IPO pricing. *The Journal of Business*, *79*(4), 1667-1702. doi: 10.1086/503644

Ljungqvist, A., & Wilhelm, W. J. (2003) IPO pricing in the dot-com bubble. *The Journal of Finance*, *58*(2), 723-752. doi: 10.1111/1540-6251.00543

Loughran, T. (1993). NYSE vs. NASDAQ returns: Market microstructure or the poor performance of initial public offerings. *Journal of Financial Economics 33*(2), 241-260. doi: 10.1016/0304-405X(93)90006-W

Loughran, T. (2002). The changing nature of the initial public offering market. *Journal of Psychology and Financial Markets*, *3*(1), 23-28. doi: 10.1207/S15327760JPFM0301_04

Loughran, T., Ritter, J. R., & Rydqvist, K. (1994) Initial public offerings: International insights. *Pacific-Basin Finance Journal*, *2*(2-3), 165-199. doi: 10.1016/0927-538X(94)90016-7

Loughran, T., & Ritter, J. R. (2004) Why has IPO underpricing changed over time? *Financial Management*, *33*(3), 5-37. doi: 10.2139/ssrn.331780

Lowry, M., & Schwert, G.W. (2002) IPO market cycles: Bubbles or sequential learning. *The Journal of Finance*, *57*(3), 1171-1200. doi: 10.1111/1540-6261.00458

Lowry, M., & Schwert, G.W. (2004) Is the IPO pricing process efficient. *Journal of Financial Economics*, *71*(1), 3-26. doi: 10.1016/S0304-405X(03)00205-8

Lyon, J. D., Barber, B. M., & Tsai, C. (1999) Improved methods for tests of long-run abnormal stock returns. *The Journal of Finance*, *54*(1), 165-201. doi: 10.1111/0022-1082.00101

McCarthy, M., Solomon, P., & Mihalek, P. (2012) Financial crisis during 2007 and 2008: Efficient markets or human behavior. *The Journal of Applied Business Research*, *28*(6), 1275-1282. Retrieved from: http://www.cluteinstitute.com/ojs/index.php/JABR/article/view/7342

McMullen, D. A., Sanchez, M. H., & Stout, D. E. (2011) Initial public offerings and the role of the management accountant. *Management Accounting Quarterly*, *12*(2), 11-23. Retrieved from:

http://connection.ebscohost.com/c/articles/61015301/initial-public-offerings-role-management-accountant

Miller, E. M. (2000) Long run underperformance of initial public offerings. *Department of Economics and Finance Working Papers*, *1991-2006*(16). Retrieved from: http://scholarworks.uno.edu/econ_wp/16

Mishkin, F. S. (1992) Anatomy of a financial crisis. *Journal of Evolutionary Economics*, *2*(2), 115-130. doi: 10.1007/BF01193536

NYSE Euronext (2014, September 30) *NYSE Composite Index Profile Characteristics*. Retrieved from http://www.nyse.com/about/listed/nya_characteristics.shtml

Pollock, T. G., & Gulati, R. (2007) Standing out from the crowd: The visibility-enhancing effects of IPO-related signals on alliance formation by entrepreneurial firms. *Strategic Organization*, *5*(4), 339-372. doi: 10.1177/1476127007083346

Pons-Sanz, V. (2005) Who benefits from IPO underpricing? Evidence from hybrid bookbuilding offerings. *ECB Working Paper Series*, *428*. Retrieved from http://ssrn.com/abstract_id=634023

Rajan, R., & Servaes, H. (1997) Analyst following of initial public offerings. *The Journal of Finance*, *52*(2), 507-529. doi: 10.1111/j.1540-6261.1997.tb04811.x

Renaissance Capital (2014, January 4). *US IPO market 2013 annual review*. Retrieved from http://www.renaissancecapital.com/ipohome/review/2013usreviewpublic.pdf

Roosenboom, P. (2012) Valuing and pricing IPOs. *Journal of Banking & Finance*, *36*(6), 1653-1664. doi: 10.1016/j.jbankfin.2012.01.009

Ritter, J. R. (1987) The cost of going public. *Journal of Financial Economics*, *19*(2), 269-281. doi: 10.1016/0304-405X(87)90005-5

Ritter, J. R. (1991) The long-run performance of initial public offerings. *The Journal of Finance*, *46*(1), 3-27. doi: 10.1111/j.1540-6261.1991.tb03743.x

Ritter, J. R., & Welch, I. (2002). A review of IPO activity, pricing and allocations. *The Journal of Finance*, *57*(4), 1795-1828. doi: 10.1111/1540-6261.00478

Ritter, J.R. (2011) *IPO Underwriter Reputation Ratings (1980 – 2011)*. Retrieved from http://bear.warrington.ufl.edu/ritter/uw_rank8011_092012.xls

Ritter, J. R. (2013, November 24) *Initial Public Offerings: Updated Statistics*. Retrieved from http://bear.warrington.ufl.edu/ritter/ipos2012statistics.pdf

Singh, I., & van der Zahn, W. M. (2008) Determinants of intellectual capital disclosure in prospectuses of initial public offerings. *Accounting and Business Research*, *38*(5), 409-431. doi: 10.1080/00014788.2008.9665774

Short, H., & Keasey, K. (1992) The underpricing of initial public offerings: Some UK evidence. *International Journal of Management Science* doi: 10.1016/0305-0483(92)90020-8

Tinic, S. M. (1988) Anatomy of initial public offerings of common stock. *The Journal of Finance*, *43*(4), 789-822. doi: 10.1111/j.1540-6261.1988.tb02606.x

Tsangarakis, N. V. (2004) The price performance of initial public offerings in Greece. *Managerial Finance*, *30*(10), 26-44. doi: 10.1108/03074350410769335

United States Securities and Exchange Commission (2014, June 8) *Company Search Page*. Retrieved from http://www.sec.gov/edgar/searchedgar/companysearch.html

Vithessonthi, C. (2008) The long-run performance of initial public offerings: New evidence from Thailand. *The Business Review*, *10*(1), 315-321. Retrieved from: http://ssrn.com/abstract=1087889

Welch, I. (1989) Seasoned offerings, imitation costs, and the underpricing of initial public offerings. *The Journal of Finance*, *44*(2), 421-449. doi: 10.2307/2328597

White, H. (1980) A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica*, *48*(4), 817-838. doi: 10.2307/1912934

World Federation of Exchanges (2014, September 30) *Monthly Reports Latest Statistics*. Retrieved from http://www.world-exchanges.org/statistics/monthly-reports

Wu, C. (2005). All initial public offerings are not created equal. *Journal of Business and Economic Studies*, *11*(1), 19-33. Retrieved from http://connection.ebscohost.com/c/articles/16871401/all-initial-public-offerings-ipos-are-not-created-equal

Xu, H., & Hamori, S. (2012) Dynamic linkages of stock prices between the BRICs and the United States: Effects of the 2008–09 financial crisis. *Journal of Asian Economics*, *23*(4), 344-352. doi: 10.1016/j.asieco.2012.04.002

Appendices

Appendix A: United States Securities and Exchange Commission Form S-1

United States Securities and Exchange Commission (2014, September 30) *Form S-1*.

Retrieved from http://www.sec.gov/about/forms/forms-1.pdf

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION Washington, D.C. 20549

FORM S-1
REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

_____
(Exact name of registrant as specified in its charter)

_____
(State or other jurisdiction of incorporation or organization)

_____
(Primary Standard Industrial Classification Code Number)

_____
(I.R.S. Employer Identification Number)

_____
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

_____
(Name, address, including zip code, and telephone number, including area code, of agent for service)

_____
(Approximate date of commencement of proposed sale to the public)

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933 check the following box: □

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. □

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. □

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. □

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of “large accelerated filer,” “accelerated filer” and “smaller reporting company” in Rule 12b- 2 of the Exchange Act. □

Large accelerated filer □

Accelerated filer □

Non-accelerated filer (Do not check if a smaller reporting company) □

Smaller reporting company □

Calculation of Registration Fee

Title of Each Class of Securities to be Registered	Amount to be Registered	Proposed Maximum Offering Price Per Unit	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee

Note: Specific details relating to the fee calculation shall be furnished in notes to the table, including references to provisions of Rule 457 (§230.457 of this chapter) relied upon, if the basis of the calculation is not otherwise evident from the information presented in the table. If the filing fee is calculated pursuant to Rule 457(o) under the Securities Act, only the title of the class of securities to be registered, the proposed maximum aggregate offering price for that class of securities and the amount of registration fee need to appear in the Calculation of Registration Fee table. Any difference between the dollar amount of securities registered for such offerings and the dollar amount of securities sold may be carried forward on a future registration statement pursuant to Rule 429 under the Securities Act.

GENERAL INSTRUCTIONS I. Eligibility Requirements for Use of Form S-1

This Form shall be used for the registration under the Securities Act of 1933 (“Securities Act”) of securities of all registrants for which no other form is authorized or prescribed, except that this Form shall not be used for securities of foreign governments or political subdivisions thereof.

II. Application of General Rules and Regulations

a. Attention is directed to the General Rules and Regulations under the Securities Act, particularly those comprising Regulation C (17 CFR 230.400 to 230.494) thereunder. That Regulation contains general requirements regarding the preparation and filing of the registration statement.
b. Attention is directed to Regulation S-K (17 CFR Part 229) for the requirements applicable to the content of the non-financial statement portions of registration statements under the Securities Act. Where this Form directs the registrant to furnish information required by Regulation S-K and the item of Regulation S-K so provides, information need only be furnished to the extent appropriate.

III. Exchange Offers

If any of the securities being registered are to be offered in exchange for securities of any other issuer, the prospectus shall also include the information which would be required by item 11 if the securities of such other issuer were registered on this Form. There shall also be included the information concerning such securities of such other issuer which would be called for by Item 9 if such securities were being registered. In connection with this instruction, reference is made to Rule 409.

IV. Roll-up Transactions

If the securities to be registered on this Form will be issued in a roll-up transaction as defined in Item 901(c) of Regulation S-K (17 CFR 229.901(c)), attention is directed to the requirements of Form S-4 applicable to roll-up transactions, including, but not limited to, General Instruction I.

V. Registration of Additional Securities

With respect to the registration of additional securities for an offering pursuant to Rule 462(b) under the Securities Act, the registrant may file a registration statement consisting only of the following: the facing page; a statement that the contents of the earlier registration statement, identified by file number, are incorporated by reference; required opinions and consents; the signature page; and any price-related information omitted from the earlier registration statement in reliance on Rule 430A that the registrant chooses to include in the new registration statement. The information contained in such a Rule 462(b) registration statement shall be deemed to be a part of the earlier registration statement as of the date of effectiveness of the Rule 462(b) registration statement. Any opinion or consent required in the Rule 462(b) registration statement may be incorporated by reference from the earlier registration statement with respect to the offering, if: (i) such opinion or consent expressly provides for such incorporation; and (ii) such opinion relates to the securities registered pursuant to Rule 462(b). *See* Rule 411(c) and Rule 439(b) under the Securities Act.

VI. Offerings of Asset-Backed Securities.

The following applies if a registration statement on this Form S-1 is being used to register an offering of asset-backed securities. Terms used in this General Instruction VI. have the same meaning as in Item 1101 of Regulation AB (17 CFR 229.1101).

A. *Items that may be Omitted*.

Such registrants may omit the information called for by Item 11, Information with Respect to the Registrant.

B. *Substitute Information to be Included*.

In addition to the Items that are otherwise required by this Form, the registrant must furnish in the prospectus the information required by Items 1102 through 1120 of Regulation AB (17 CFR 229.1102 through 229.1120).

C. *Signatures*.

The registration statement must be signed by the depositor, the depositor's principal executive officer or officers, principal financial officer and controller or principal accounting officer, and by at least a majority of the depositor's board of directors or persons performing similar functions.

VII. Eligibility to Use Incorporation by Reference

If a registrant meets the following requirements immediately prior to the time of filing a registration statement on this Form, it may elect to provide information required by Items 3 through 11 of this Form in accordance with Item 11A and Item 12 of this Form:

A. The registrant is subject to the requirement to file reports pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 ("Exchange Act").

B. The registrant has filed all reports and other materials required to be filed by Sections 13(a), 14, or 15(d) of the Exchange Act during the preceding 12 months (or for such shorter period that the registrant was required to file such reports and materials).

C. The registrant has filed an annual report required under Section 13(a) or Section 15(d) of the Exchange Act for its most recently completed fiscal year.

D. The registrant is not:
1. And during the past three years neither the registrant nor any of its predecessors was:

(a) A blank check company as defined in Rule 419(a)(2) (§230.419(a)(2));

(b) A shell company, other than a business combination related shell company, each as defined in Rule 405 (§230.405); or

(c) A registrant for an offering of penny stock as defined in Rule 3a51-1 of the Exchange Act (§240.3a51-1 of this chapter).

2. Registering an offering that effectuates a business combination transaction as defined in Rule 165(f)(1) (§230.165(f)(1) of this chapter).

E. If a registrant is a successor registrant it shall be deemed to have satisfied conditions A., B., C., and D.2 above if:

1. Its predecessor and it, taken together, do so, provided that the succession was primarily for the purpose of changing the state of incorporation of the predecessor or forming a holding company and that the assets and liabilities of the successor at the time of succession were substantially the same as those of the predecessor; or

2. All predecessors met the conditions at the time of succession and the registrant has continued to do so since the succession.

F. The registrant makes its periodic and current reports filed pursuant to Section 13 or Section 15(d) of the Exchange Act that are incorporated by reference pursuant to Item 11A or Item 12 of this Form readily available and accessible on a Web site maintained by or for the registrant and containing information about the registrant.

PART I−INFORMATION REQUIRED IN PROSPECTUS

Item 1. Forepart of the Registration Statement and Outside Front Cover Page of Prospectus.

Set forth in the forepart of the registration statement and on the outside front cover page of the prospectus the information required by Item 501 of Regulation S-K (§229.501 of this chapter).

Item 2. Inside Front and Outside Back Cover Pages of Prospectus.

Set forth on the inside front cover page of the prospectus or, where permitted, on the outside back cover page, the information required by Item 502 of Regulation S-K (§229.502 of this chapter).

Item 3. Summary Information, Risk Factors and Ratio of Earnings to Fixed Charges.

Furnish the information required by Item 503 of Regulation S-K (§229.503 of this chapter).

Item 4. Use of Proceeds.

Furnish the information required by Item 504 of Regulation S-K (§229.504 of this chapter).

Item 5. Determination of Offering Price.

Furnish the information required by Item 505 of Regulation S-K (§229.505 of this chapter).

Item 6. Dilution.

Furnish the information required by Item 506 of Regulation S-K (§229.506 of this chapter).

Item 7. Selling Security Holders.

Furnish the information required by Item 507 of Regulation S-K (§229.507 of this chapter).

Item 8. Plan of Distribution.

Furnish the information required by Item 508 of Regulation S-K (§229.508 of this chapter).

Item 9. Description of Securities to be Registered.

Furnish the information required by Item 202 of Regulation S-K (§229.202 of this chapter).

Item 10. Interests of Named Experts and Counsel.

Furnish the information required by Item 509 of Regulation S-K (§229.509 of this chapter).

Item 11. Information with Respect to the Registrant.

Furnish the following information with respect to the registrant:

1. (a) Information required by Item 101 of Regulation S-K (§229.101 of this chapter), description of business;
2. (b) Information required by Item 102 of Regulation S-K (§229.102 of this chapter), description of property;
3. (c) Information required by Item 103 of Regulation S-K (§229.103 of this chapter), legal proceedings;

4. (d) Where common equity securities are being offered, information required by Item 201 of Regulation S-K (§229.201 of this chapter), market price of and dividends on the registrant's common equity and related stockholder matters;
5. (e) Financial statements meeting the requirements of Regulation S-X (17 CFR Part 210) (Schedules required under Regulation S- X shall be filed as "Financial Statement Schedules" pursuant to Item 15, Exhibits and Financial Statement Schedules, of this Form), as well as any financial information required by Rule 3-05 and Article 11 of Regulation S-X. A smaller reporting company may provide the information in Rule 8-04 and 8-05 of Regulation S-X in lieu of the financial information required by Rule 3-05 and Article 11 of Regulation S-X;
6. (f) Information required by Item 301 of Regulation S-K (§229.301 of this chapter), selected financial data;
7. (g) Information required by Item 302 of Regulation S-K (§229.302 of this chapter), supplementary financial in formation;

8. (h) Information required by Item 303 of Regulation S-K (§229.303 of this chapter), management's discussion and analysis of financial condition and results of operations;
9. (i) Information required by Item 304 of Regulation S-K (§229.304 of this chapter), changes in and disagreements with accountants on accounting and financial disclosure;
10. (j) Information required by Item 305 of Regulation S-K (§229.305 of this chapter), quantitative and qualitative disclosures about market risk.
11. (k) Information required by Item 401 of Regulation S-K (§229.401 of this chapter), directors and executive officers;
12. (l) (l) Information required by Item 402 of Regulation S-K (§229.402 of this chapter), executive compensation, and information required by paragraph (e)(4) of Item 407 of Regulation S-K (§229.407 of this chapter), corporate governance;
13. (m) Information required by Item 403 of Regulation S-K (§229.403 of this chapter), security ownership of certain beneficial owners and management; and
14. (n) Information required by Item 404 of Regulation S-K (§229.404 of this chapter), transactions with related persons, promoters and certain control persons, and Item 407(a) of Regulation S-K (§229.407(a) of this chapter), corporate governance.

Item 11A. Material Changes.

If the registrant elects to incorporate information by reference pursuant to General Instruction VII., describe any and all material changes in the registrant's affairs which have occurred since the end of the latest fiscal year for which audited financial statements were included in the latest Form 10-K and that have not been described in a Form 10-Q or Form 8-K filed under the Exchange Act.

Item 12. Incorporation of Certain Information by Reference.

If the registrant elects to incorporate information by reference pursuant to General Instruction VII.:

(a) It must specifically incorporate by reference into the prospectus contained in the registration statement the following documents by means of a statement to that effect in the prospectus listing all such documents:

(1) The registrant's latest annual report on Form 10-K filed pursuant to Section 13(a) or Section 15(d) of the Exchange Act that contains financial statements for the registrant's latest fiscal year for which a Form 10-K was required to have been filed; and

(2) All other reports filed pursuant to Section 13(a) or 15(d) of the Exchange Act or proxy or information statements filed pursuant to Section 14 of the Exchange Act since the end of the fiscal year covered by the annual report referred to in paragraph (a)(1) above.

Note to Item 12(a). Attention is directed to Rule 439 (§230.439) regarding consent to use of material incorporated by reference. (b)(1) The registrant must state:

(i) That it will provide to each person, including any beneficial owner, to whom a prospectus is delivered, a copy of any or all of the reports or documents that have been incorporated by reference in the prospectus contained in the registration statement but not delivered with the prospectus;

(ii) That it will provide these reports or documents upon written or oral request; (iii) That it will provide these reports or documents at no cost to the requester;

(iv) The name, address, telephone number, and e-mail address, if any, to which the request for these reports or documents must be made; and

(v) The registrant's Web site address, including the uniform resource locator (URL) where the incorporated reports and other documents may be accessed.

Note to Item 12(b)(1). If the registrant sends any of the information that is incorporated by reference in the prospectus contained in the registration statement to security holders, it also must send any exhibits that are specifically incorporated by reference in that information.

(2) The registrant must:

(i) Identify the reports and other information that it files with the SEC; and

(ii) State that the public may read and copy any materials it files with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Washington, DC 20549. State that the public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. If the registrant is an electronic filer, state that the SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC and state the address of that site (http://www.sec.gov).

Item 12A. Disclosure of Commission Position on Indemnification for Securities Act Liabilities.

Furnish the information required by Item 510 of Regulation S-K (§229.510 of this chapter).

PART II−INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution.

Furnish the information required by Item 511 of Regulation S-K (§229.511 of this chapter).

Item 14. Indemnification of Directors and Officers.

Furnish the information required by Item 702 of Regulation S-K (§229.702 of this chapter).

Item 15. Recent Sales of Unregistered Securities.

Furnish the information required by Item 701 of Regulation S-K (§229.701 of this chapter).

Item 16. Exhibits and Financial Statement Schedules.

1. (a) Subject to the rules regarding incorporation by reference, furnish the exhibits as required by Item 601 of Regulation S-K (§229.601 of this chapter).
2. (b) Furnish the financial statement schedules required by Regulation S-X (17 CFR Part 210) and Item 11(e) of this Form. These schedules shall be lettered or numbered in the manner described for exhibits in paragraph (a).

Item 17. Undertakings.

Furnish the undertakings required by Item 512 of Regulation S-K (§229.512 of this chapter).

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized in the City of

_____,
State of _____, on_____ , 20___.

_____
(Registrant)

_____
By (Signature and Title)

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

_____
(Signature)

_____
(Title)

_____
(Date)

Instructions.

1. The registration statement shall be signed by the registrant, its principal executive officer or officers, its principal financial officer, its controller or principal accounting officer and by at least a majority of the board of directors or persons performing similar functions. If the registrant is a foreign person, the registration statement shall also be signed by its authorized representative in the United States. Where the registrant is a limited partnership, the registration statement shall be signed by a majority of the board of directors of any corporate general partner signing the registration statement.
2. The name of each person who signs the registration statement shall be typed or printed beneath his signature. Any person who occupies more than one of the specified positions shall indicate each capacity in which he signs the registration statement. Attention is directed to Rule 402 concerning manual signatures and to Item 601 of Regulation S-K concerning signatures pursuant to powers of attorney.

INSTRUCTIONS AS TO SUMMARY PROSPECTUSES

1. A summary prospectus used pursuant to Rule 431 (§230.431 of this chapter), shall at the time of its use contain much of the information specified below as is then included in the registration statement. All other information and documents contained in the registration statement may be omitted.

(a) As to Item 1, the aggregate offering price to the public, the aggregate underwriting discounts and commissions and the offering price per unit to the public;

(b) As to Item 4, a brief statement of the principal purposes for which the proceeds are to be used;

(c) As to Item 7, a statement as to the amount of the offering, if any, to be made for the account of security holders;

(d) As to Item 8, the name of the managing underwriter or underwriters and a brief statement as to the nature of the underwriter's obligation to take the securities; if any securities to be registered are to be offered otherwise than through underwriters, a brief statement as to the manner of distribution; and, if securities are to be offered otherwise than for cash. a brief statement as to the general purposes of the distribution, the basis upon which the securities are to be offered, the amount of compensation and other expenses of distribution, and by whom they are to be borne;

(e) As to Item 9, a brief statement as to dividend rights, voting rights, conversion rights, interest, maturity; 7

(f) As to Item 11, a brief statement of the general character of the business done and intended to be done, the selected financial data (Item 301 of Regulation S-K (§229.301 of this chapter)) and a brief statement of the nature and present status of any material pending legal proceedings; and

(g) A tabular presentation of notes payable, long term debt, deferred credits, minority interests, if material, and the equity section of the latest balance sheet filed, as may be appropriate.

2. The summary prospectus shall not contain a summary or condensation of any other required financial information except as provided above.
3. Where securities being registered are to be offered in exchange for securities of any other issuer, the summary prospectus also shall contain that information as to Items 9 and 11 specified in paragraphs (e) and (f) above which would be required if the securities of such other issuer were registered on this Form.

The Commission may, upon the request of the registrant, and where consistent with the protection of investors, permit the omission of any of the information herein required or the furnishing in substitution therefor of appropriate information of comparable character. The Commission may also require the inclusion of other information in addition to, or in substitution for, the information herein required in any case where such information is necessary or appropriate for the protection of investors.

Appendix B: Regression Estimates

Table B1
OLS Regression Estimates for All Data (2002-10)

Dependent Variable: RETDAY
Method: Least Squares
Included observations: 607
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.016425	0.102086	0.160897	0.87
SHPRICE	-0.000701	0.000616	-1.138711	0.26
OFRATE	-0.03352	0.016817	-1.993194	0.05
PE	-1.73E-06	1.67E-06	-1.034736	0.30
FYEDAYS	2.54E-05	3.50E-05	0.72644	0.47
STEX	-0.007014	0.009324	-0.752296	0.45
LOG(CAPT)	0.000515	0.005367	0.096016	0.92
LOG(1+AGE)	0.003537	0.002908	1.21657	0.22
PROFIT	-2.67E-06	0.000111	-0.023982	0.98
AUDIT	-0.007386	0.014816	-0.498529	0.62
UWRITE	0.011705	0.009371	1.249018	0.21

R-squared	0.0155	Mean dependent var	0.018567
Adjusted R-squared	-0.001047	S.D. dependent var	0.088445
S.E. of regression	0.088491	Akaike info criterion	-1.993848
Sum squared resid	4.659236	Schwarz criterion	-1.913855
Log likelihood	615.1359	Hannan-Quinn criter.	-1.962722
F-statistic	0.936748	Durbin-Watson stat	1.94884
Prob(F-statistic)	0.498609	Wald F-statistic	1.447349
Prob(Wald F-statistic)	0.155681		

Table B2

OLS Regression Estimates for All Data (2002-10)

Dependent Variable: RETWEEK
Method: Least Squares
Included observations: 607
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.068456	0.157623	0.434301	0.66
SHPRICE	-0.000296	0.000908	-0.325395	0.75
OFRATE	-0.047236	0.023452	-2.014143	0.04
PE	-4.98E-06	4.27E-06	-1.167058	0.24
FYEDAYS	5.98E-05	5.49E-05	1.089716	0.28
STEX	-0.009607	0.012794	-0.750835	0.45
LOG(CAPT)	-0.002805	0.008175	-0.343198	0.73
LOG(1+AGE)	0.006501	0.005147	1.263061	0.21
PROFIT	-0.000314	0.000205	-1.53579	0.13
AUDIT	-0.001312	0.019683	-0.066683	0.95
UWRITE	0.011035	0.013866	0.795862	0.43

R-squared	0.014085	Mean dependent var	0.025321
Adjusted R-squared	-0.002485	S.D. dependent var	0.131839
S.E. of regression	0.132003	Akaike info criterion	-1.194005
Sum squared resid	10.3677	Schwarz criterion	-1.114012
Log likelihood	372.7834	Hannan-Quinn criter.	-1.162879
F-statistic	0.850057	Durbin-Watson stat	1.947372
Prob(F-statistic)	0.580409	Wald F-statistic	1.218192
Prob(Wald F-statistic)	0.275816		

Table B3

OLS Regression Estimates for All Data (2002-10)

Dependent Variable: RETMONTH
Method: Least Squares
Included observations: 607
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.06877	0.180154	-0.381732	0.70
SHPRICE	-0.000226	0.001177	-0.191913	0.85
OFRATE	-0.080234	0.029024	-2.764359	0.01
PE	-5.97E-06	4.52E-06	-1.321676	0.19
FYEDAYS	4.24E-05	6.62E-05	0.640156	0.52
STEX	-0.007473	0.015591	-0.479305	0.63
LOG(CAPT)	0.004385	0.009804	0.447293	0.65
LOG(1+AGE)	0.012826	0.006221	2.061601	0.04
PROFIT	-0.000789	0.000467	-1.691718	0.09
AUDIT	0.019365	0.02314	0.836846	0.40
UWRITE	-0.022074	0.01777	-1.242233	0.21

R-squared	0.023983	Mean dependent var	0.029873
Adjusted R-squared	0.007579	S.D. dependent var	0.164477
S.E. of regression	0.163853	Akaike info criterion	-0.761714
Sum squared resid	15.97436	Schwarz criterion	-0.681721
Log likelihood	241.7994	Hannan-Quinn criter.	-0.730589
F-statistic	1.462045	Durbin-Watson stat	1.934526
Prob(F-statistic)	0.149736	Wald F-statistic	1.9797
Prob(Wald F-statistic)	0.033217		

Table B4

OLS Regression Estimates for All Data (2002-10)

Dependent Variable: RETQUARTER
Method: Least Squares
Included observations: 607
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.016302	0.33815	0.04821	0.96
SHPRICE	-0.000438	0.003215	-0.136263	0.89
OFRATE	-0.110948	0.058076	-1.910398	0.06
PE	-2.46E-05	1.73E-05	-1.416121	0.16
FYEDAYS	0.000248	0.000122	2.036173	0.04
STEX	0.003229	0.031845	0.10141	0.92
LOG(CAPT)	-2.57E-05	0.018456	-0.00139	1.00
LOG(1+AGE)	0.007164	0.011424	0.627065	0.53
PROFIT	0.000561	0.000536	1.04674	0.30
AUDIT	-0.006272	0.046685	-0.134342	0.89
UWRITE	0.049093	0.033177	1.479752	0.14

R-squared	0.023342	Mean dependent var	0.072723
Adjusted R-squared	0.006928	S.D. dependent var	0.32869
S.E. of regression	0.327549	Akaike info criterion	0.623627
Sum squared resid	63.83658	Schwarz criterion	0.70362
Log likelihood	-177.959	Hannan-Quinn criter.	0.654753
F-statistic	1.422066	Durbin-Watson stat	1.948946
Prob(F-statistic)	0.166369	Wald F-statistic	1.88019
Prob(Wald F-statistic)	0.045153		

Table B5

OLS Regression Estimates for All Data (2002-10)

Dependent Variable: RETY1
Method: Least Squares
Included observations: 607
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.113558	0.847164	0.134044	0.89
SHPRICE	0.001792	0.007847	0.228383	0.82
OFRATE	-0.238258	0.113038	-2.107764	0.04
PE	-3.34E-05	2.22E-05	-1.504369	0.13
FYEDAYS	-0.000228	0.000263	-0.868822	0.39
STEX	-0.004155	0.076141	-0.054575	0.96
LOG(CAPT)	-0.006171	0.045947	-0.134301	0.89
LOG(1+AGE)	0.05397	0.024614	2.19264	0.03
PROFIT	0.001319	0.000785	1.681856	0.09
AUDIT	0.027682	0.084712	0.32678	0.74
UWRITE	0.093234	0.063493	1.4684	0.14

R-squared	0.01988	Mean dependent var	0.118175
Adjusted R-squared	0.003407	S.D. dependent var	0.669831
S.E. of regression	0.668689	Akaike info criterion	2.05099
Sum squared resid	266.0513	Schwarz criterion	2.130983
Log likelihood	-610.4499	Hannan-Quinn criter.	2.082115
F-statistic	1.206833	Durbin-Watson stat	2.014236
Prob(F-statistic)	0.283212	Wald F-statistic	2.655903
Prob(Wald F-statistic)	0.003535		

Table B6

OLS Regression Estimates for All Data (2002-10)

Dependent Variable: RETY2
Method: Least Squares
Included observations: 607
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.312623	1.010962	0.309233	0.76
SHPRICE	0.018678	0.011235	1.662521	0.10
OFRATE	-0.022568	0.200873	-0.11235	0.91
PE	2.10E-06	2.20E-05	0.095271	0.92
FYEDAYS	-6.90E-05	0.000303	-0.227697	0.82
STEX	-0.041167	0.083898	-0.490681	0.62
LOG(CAPT)	-0.045636	0.056327	-0.810202	0.42
LOG(1+AGE)	0.102575	0.03197	3.208493	0.00
PROFIT	0.000812	0.001569	0.517273	0.61
AUDIT	0.163855	0.093918	1.744652	0.08
UWRITE	0.06939	0.078899	0.879479	0.38

R-squared	0.040498	Mean dependent var	0.108034
Adjusted R-squared	0.024371	S.D. dependent var	0.811792
S.E. of regression	0.801838	Akaike info criterion	2.414166
Sum squared resid	382.5523	Schwarz criterion	2.494159
Log likelihood	-720.4923	Hannan-Quinn criter.	2.445292
F-statistic	2.511303	Durbin-Watson stat	1.881481
Prob(F-statistic)	0.005815	Wald F-statistic	1.996074
Prob(Wald F-statistic)	0.031559		

Table B7

OLS Regression Estimates for All Data (2002-10)

Dependent Variable: RETY3
Method: Least Squares
Included observations: 607
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.696049	1.260278	-0.552298	0.58
SHPRICE	0.015803	0.01609	0.982111	0.33
OFRATE	-0.192858	0.251444	-0.767002	0.44
PE	2.38E-05	2.10E-05	1.131881	0.26
FYEDAYS	0.00011	0.000379	0.288998	0.77
STEX	0.000534	0.108008	0.004942	1.00
LOG(CAPT)	0.010927	0.072583	0.150546	0.88
LOG(1+AGE)	0.068015	0.048746	1.395281	0.16
PROFIT	0.001193	0.001618	0.737052	0.46
AUDIT	0.146533	0.134109	1.09264	0.28
UWRITE	0.111582	0.108896	1.024658	0.31

R-squared	0.02989	Mean dependent var	0.099136
Adjusted R-squared	0.013586	S.D. dependent var	1.041682
S.E. of regression	1.034582	Akaike info criterion	2.923857
Sum squared resid	636.8641	Schwarz criterion	3.00385
Log likelihood	-874.9287	Hannan-Quinn criter.	2.954983
F-statistic	1.833276	Durbin-Watson stat	1.934942
Prob(F-statistic)	0.052052	Wald F-statistic	1.836202
Prob(Wald F-statistic)	0.051595		

Table B8

OLS Regression Estimates for Benchmark (2002-04)

Dependent Variable: RETDAY
Method: Least Squares
Included observations: 157
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.148432	0.194563	-0.762899	0.45
SHPRICE	-0.001044	0.000658	-1.587758	0.11
OFRATE	-0.062066	0.02836	-2.188513	0.03
PE	1.06E-05	1.46E-05	0.725069	0.47
FYEDAYS	6.11E-05	7.50E-05	0.814717	0.42
STEX	-0.004376	0.01456	-0.300556	0.76
LOG(CAPT)	0.008938	0.010284	0.869097	0.39
LOG(1+AGE)	-0.000353	0.005221	-0.067688	0.95
PROFIT	-0.00016	0.000541	-0.295589	0.77
AUDIT	0.013501	0.025519	0.529041	0.60
UWRITE	0.00052	0.018096	0.028738	0.98

R-squared	0.038585	Mean dependent var	0.019425
Adjusted R-squared	-0.027265	S.D. dependent var	0.080242
S.E. of regression	0.081328	Akaike info criterion	-2.11316
Sum squared resid	0.965684	Schwarz criterion	-1.899028
Log likelihood	176.8831	Hannan-Quinn criter.	-2.026194
F-statistic	0.585953	Durbin-Watson stat	2.14414
Prob(F-statistic)	0.823525	Wald F-statistic	0.970269
Prob(Wald F-statistic)	0.471884		

Table B9

OLS Regression Estimates for Benchmark (2002-04)

Dependent Variable: RETWEEK
Method: Least Squares
Included observations: 157
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.168581	0.258229	-0.652836	0.51
SHPRICE	-0.000913	0.001121	-0.814315	0.42
OFRATE	-0.091627	0.043381	-2.112138	0.04
PE	7.30E-06	1.85E-05	0.394646	0.69
FYEDAYS	8.83E-05	0.000106	0.835954	0.40
STEX	0.002054	0.020127	0.102042	0.92
LOG(CAPT)	0.008159	0.01355	0.602126	0.55
LOG(1+AGE)	0.006126	0.007865	0.778909	0.44
PROFIT	-0.001065	0.000903	-1.179284	0.24
AUDIT	0.042943	0.039645	1.083176	0.28
UWRITE	-0.012124	0.029532	-0.410555	0.68

R-squared	0.039743	Mean dependent var	0.022309
Adjusted R-squared	-0.026028	S.D. dependent var	0.122767
S.E. of regression	0.124354	Akaike info criterion	-1.263876
Sum squared resid	2.257743	Schwarz criterion	-1.049744
Log likelihood	110.2142	Hannan-Quinn criter.	-1.176909
F-statistic	0.604269	Durbin-Watson stat	2.111565
Prob(F-statistic)	0.808363	Wald F-statistic	1.297518
Prob(Wald F-statistic)	0.23702		

Table B10

OLS Regression Estimates for Benchmark (2002-04)

Dependent Variable:
RETMONTH
Method: Least Squares
Included observations: 157
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.253079	0.336626	0.751811	0.45
SHPRICE	-2.59E-05	0.001924	-0.013472	0.99
OFRATE	-0.117909	0.05958	-1.978997	0.05
PE	-3.60E-05	3.05E-05	-1.180823	0.24
FYEDAYS	2.06E-05	0.000123	0.166521	0.87
STEX	0.025716	0.029482	0.872268	0.38
LOG(CAPT)	-0.011056	0.018063	-0.612098	0.54
LOG(1+AGE)	0.004887	0.010795	0.452714	0.65
PROFIT	0.000266	0.000706	0.377492	0.71
AUDIT	0.048518	0.052788	0.919113	0.36
UWRITE	-0.027052	0.036308	-0.745075	0.46

R-squared	0.030947	Mean dependent var	0.047303
Adjusted R-squared	-0.035426	S.D. dependent var	0.152246
S.E. of regression	0.154919	Akaike info criterion	-0.824343
Sum squared resid	3.503978	Schwarz criterion	-0.610211
Log likelihood	75.71089	Hannan-Quinn criter.	-0.737376
F-statistic	0.466255	Durbin-Watson stat	2.007417
Prob(F-statistic)	0.909432	Wald F-statistic	0.793576
Prob(Wald F-statistic)	0.634994		

Table B11

OLS Regression Estimates for Benchmark (2002-04)

Dependent Variable: RETQUARTER
Method: Least Squares
Included observations: 157
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.760065	0.583108	1.303471	0.19
SHPRICE	0.002335	0.005231	0.4464	0.66
OFRATE	-0.141888	0.113223	-1.253168	0.21
PE	3.59E-05	6.22E-05	0.57799	0.56
FYEDAYS	-9.24E-05	0.000246	-0.375999	0.71
STEX	0.047624	0.061117	0.779235	0.44
LOG(CAPT)	-0.039217	0.030809	-1.272902	0.21
LOG(1+AGE)	0.008119	0.019317	0.420277	0.67
PROFIT	0.001167	0.001072	1.08877	0.28
AUDIT	0.077997	0.077258	1.009569	0.31
UWRITE	0.047339	0.075363	0.628153	0.53

R-squared	0.019316	Mean dependent var	0.099331
Adjusted R-squared	-0.047855	S.D. dependent var	0.327903
S.E. of regression	0.335657	Akaike info criterion	0.722036
Sum squared resid	16.4492	Schwarz criterion	0.936168
Log likelihood	-45.6798	Hannan-Quinn criter.	0.809002
F-statistic	0.287563	Durbin-Watson stat	1.930869
Prob(F-statistic)	0.983133	Wald F-statistic	0.635112
Prob(Wald F-statistic)	0.781907		

Table B12
OLS Regression Estimates for Benchmark (2002-04)

Dependent Variable: RETY1
Method: Least Squares
Included observations: 157
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.785405	1.306154	2.132525	0.03
SHPRICE	0.013716	0.011896	1.152974	0.25
OFRATE	-0.19873	0.236165	-0.84149	0.40
PE	-0.000141	0.000103	-1.374746	0.17
FYEDAYS	-0.000414	0.00043	-0.963831	0.34
STEX	0.116832	0.127384	0.917162	0.36
LOG(CAPT)	-0.148667	0.072627	-2.046988	0.04
LOG(1+AGE)	0.04066	0.039632	1.02596	0.31
PROFIT	0.002827	0.001982	1.425957	0.16
AUDIT	0.011337	0.21499	0.052735	0.96
UWRITE	0.174231	0.119207	1.46158	0.15

R-squared	0.054964	Mean dependent var	0.152768
Adjusted R-squared	-0.009764	S.D. dependent var	0.571616
S.E. of regression	0.5744	Akaike info criterion	1.796506
Sum squared resid	48.17054	Schwarz criterion	2.010638
Log likelihood	-130.0257	Hannan-Quinn criter.	1.883473
F-statistic	0.849148	Durbin-Watson stat	1.982788
Prob(F-statistic)	0.582322	Wald F-statistic	1.061829
Prob(Wald F-statistic)	0.395516		

Table B13

OLS Regression Estimates for Benchmark (2002-04)

Dependent Variable: RETY2
Method: Least Squares
Included observations: 157
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.73986	2.647192	1.035006	0.30
SHPRICE	0.032351	0.015626	2.070346	0.04
OFRATE	0.06182	0.515241	0.119983	0.90
PE	-6.22E-05	0.000196	-0.316986	0.75
FYEDAYS	-0.000156	0.000721	-0.2167	0.83
STEX	-0.017146	0.223616	-0.076676	0.94
LOG(CAPT)	-0.157985	0.149341	-1.05788	0.29
LOG(1+AGE)	0.122671	0.082362	1.489402	0.14
PROFIT	-0.003277	0.00684	-0.479107	0.63
AUDIT	-0.129661	0.422018	-0.30724	0.76
UWRITE	0.072704	0.178708	0.406831	0.68

R-squared	0.062285	Mean dependent var	0.311629
Adjusted R-squared	-0.001942	S.D. dependent var	0.915367
S.E. of regression	0.916255	Akaike info criterion	2.730444
Sum squared resid	122.5704	Schwarz criterion	2.944576
Log likelihood	-203.3398	Hannan-Quinn criter.	2.81741
F-statistic	0.969769	Durbin-Watson stat	2.117179
Prob(F-statistic)	0.472321	Wald F-statistic	0.627571
Prob(Wald F-statistic)	0.788474		

Table B14

OLS Regression Estimates for Benchmark (2002-04)

Dependent Variable: RETY3
Method: Least Squares
Included observations: 157
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.297254	2.569287	1.283334	0.20
SHPRICE	0.057434	0.020274	2.832923	0.01
OFRATE	-0.46145	0.551803	-0.836258	0.40
PE	0.000139	0.000277	0.502822	0.62
FYEDAYS	-0.000354	0.000925	-0.382344	0.70
STEX	-0.168077	0.278472	-0.60357	0.55
LOG(CAPT)	-0.245185	0.148385	-1.65235	0.10
LOG(1+AGE)	0.213446	0.124854	1.70957	0.09
PROFIT	-0.001725	0.007851	-0.219749	0.83
AUDIT	0.497951	0.203686	2.444701	0.02
UWRITE	0.309822	0.206074	1.50345	0.13

R-squared	0.138006	Mean dependent var	0.26519
Adjusted R-squared	0.078965	S.D. dependent var	1.187782
S.E. of regression	1.139921	Akaike info criterion	3.167282
Sum squared resid	189.7152	Schwarz criterion	3.381414
Log likelihood	-237.6317	Hannan-Quinn criter.	3.254249
F-statistic	2.337472	Durbin-Watson stat	2.04682
Prob(F-statistic)	0.013811	Wald F-statistic	2.017415
Prob(Wald F-statistic)	0.035405		

Table B15

OLS Regression Estimates for Pre-Crisis (2005-07)

Dependent Variable: RETDAY
Method: Least Squares
Included observations: 311
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.042365	0.168736	0.251073	0.80
SHPRICE	-0.001139	0.00141	-0.807502	0.42
OFRATE	-0.000533	0.028501	-0.018705	0.99
PE	1.28E-05	9.35E-06	1.372257	0.17
FYEDAYS	3.52E-05	4.61E-05	0.763276	0.45
STEX	-0.006407	0.014899	-0.43005	0.67
LOG(CAPT)	0.0005	0.00898	0.055698	0.96
LOG(1+AGE)	-0.000583	0.004193	-0.139044	0.89
PROFIT	-7.01E-05	4.76E-05	-1.472518	0.14
AUDIT	-0.026481	0.019833	-1.33516	0.18
UWRITE	0.005279	0.012284	0.429721	0.67

R-squared	0.024899	Mean dependent var	0.019625
Adjusted R-squared	-0.007604	S.D. dependent var	0.085572
S.E. of regression	0.085896	Akaike info criterion	-2.036622
Sum squared resid	2.213453	Schwarz criterion	-1.904347
Log likelihood	327.6948	Hannan-Quinn criter.	-1.98375
F-statistic	0.766043	Durbin-Watson stat	1.87459
Prob(F-statistic)	0.661564	Wald F-statistic	1.288476
Prob(Wald F-statistic)	0.23607		

Table B16

OLS Regression Estimates for Pre-Crisis (2005-07)

Dependent Variable: RETWEEK
Method: Least Squares
Included observations: 311
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.124222	0.264398	0.46983	0.64
SHPRICE	-0.000331	0.002023	-0.163598	0.87
OFRATE	-0.007849	0.042134	-0.186283	0.85
PE	2.17E-05	1.62E-05	1.34129	0.18
FYEDAYS	9.78E-05	7.62E-05	1.28311	0.20
STEX	-0.0117	0.020236	-0.578167	0.56
LOG(CAPT)	-0.004707	0.014209	-0.33129	0.74
LOG(1+AGE)	0.000199	0.00826	0.024079	0.98
PROFIT	-0.000352	0.000106	-3.313695	0.00
AUDIT	-0.018247	0.0246	-0.741731	0.46
UWRITE	0.003863	0.018242	0.211759	0.83

R-squared	0.022328	Mean dependent var	0.027603
Adjusted R-squared	-0.010261	S.D. dependent var	0.128463
S.E. of regression	0.12912	Akaike info criterion	-1.221418
Sum squared resid	5.001603	Schwarz criterion	-1.089142
Log likelihood	200.9305	Hannan-Quinn criter.	-1.168545
F-statistic	0.68513	Durbin-Watson stat	1.876364
Prob(F-statistic)	0.73821	Wald F-statistic	1.933161
Prob(Wald F-statistic)	0.040493		

Table B17

OLS Regression Estimates for Pre-Crisis (2005-07)

Dependent Variable:
RETMONTH
Method: Least Squares
Included observations: 311
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.138392	0.347968	-0.397715	0.69
SHPRICE	-3.91E-05	0.002698	-0.014482	0.99
OFRATE	-0.033248	0.053217	-0.624764	0.53
PE	3.62E-05	2.24E-05	1.621704	0.11
FYEDAYS	4.24E-05	0.0001	0.423491	0.67
STEX	-0.031314	0.024623	-1.27173	0.20
LOG(CAPT)	0.009389	0.018813	0.49905	0.62
LOG(1+AGE)	0.012349	0.010083	1.224742	0.22
PROFIT	-0.001256	0.000141	-8.897829	0.00
AUDIT	-0.018782	0.030962	-0.606595	0.54
UWRITE	-0.036942	0.025009	-1.477132	0.14

R-squared	0.045304	Mean dependent var	0.027535
Adjusted R-squared	0.013481	S.D. dependent var	0.170527
S.E. of regression	0.169374	Akaike info criterion	-0.67869
Sum squared resid	8.606231	Schwarz criterion	-0.546414
Log likelihood	116.5363	Hannan-Quinn criter.	-0.625817
F-statistic	1.423631	Durbin-Watson stat	1.894277
Prob(F-statistic)	0.168793	Wald F-statistic	10.81286
Prob(Wald F-statistic)	0		

Table B18

OLS Regression Estimates for Pre-Crisis (2005-07)

Dependent Variable: RETQUARTER
Method: Least Squares
Included observations: 311
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.507568	0.616618	-0.823149	0.41
SHPRICE	-0.001193	0.005207	-0.229089	0.82
OFRATE	0.029306	0.096706	0.303045	0.76
PE	3.17E-05	4.68E-05	0.676758	0.50
FYEDAYS	0.000219	0.00019	1.153713	0.25
STEX	-0.09258	0.048774	-1.898118	0.06
LOG(CAPT)	0.029175	0.033319	0.875631	0.38
LOG(1+AGE)	0.004121	0.01837	0.224354	0.82
PROFIT	0.000248	0.000325	0.764076	0.45
AUDIT	-0.064954	0.064765	-1.002931	0.32
UWRITE	0.048145	0.0443	1.086794	0.28

R-squared	0.02353	Mean dependent var	0.067332
Adjusted R-squared	-0.009019	S.D. dependent var	0.330867
S.E. of regression	0.332356	Akaike info criterion	0.669508
Sum squared resid	33.13811	Schwarz criterion	0.801783
Log likelihood	-93.10845	Hannan-Quinn criter.	0.72238
F-statistic	0.722904	Durbin-Watson stat	1.977498
Prob(F-statistic)	0.702796	Wald F-statistic	0.822502
Prob(Wald F-statistic)	0.607174		

Table B19

OLS Regression Estimates for Pre-Crisis (2005-07)

Dependent Variable: RETY1
Method: Least Squares
Included observations: 311
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.680329	1.852168	-0.367315	0.71
SHPRICE	-0.000543	0.012177	-0.044577	0.96
OFRATE	-0.101249	0.190723	-0.530867	0.60
PE	-5.45E-05	9.96E-05	-0.547126	0.58
FYEDAYS	-0.000167	0.000502	-0.331961	0.74
STEX	-0.056553	0.139596	-0.405122	0.69
LOG(CAPT)	0.040702	0.095681	0.425393	0.67
LOG(1+AGE)	0.05293	0.0397	1.333258	0.18
PROFIT	0.000643	0.00033	1.951475	0.05
AUDIT	-0.04618	0.124139	-0.372001	0.71
UWRITE	0.000175	0.092018	0.001901	1.00

R-squared	0.009209	Mean dependent var	0.129742
Adjusted R-squared	-0.023818	S.D. dependent var	0.735312
S.E. of regression	0.744017	Akaike info criterion	2.281225
Sum squared resid	166.0686	Schwarz criterion	2.4135
Log likelihood	-343.7304	Hannan-Quinn criter.	2.334097
F-statistic	0.278827	Durbin-Watson stat	1.980295
Prob(F-statistic)	0.985504	Wald F-statistic	1.020048
Prob(Wald F-statistic)	0.426239		

Table B20

OLS Regression Estimates for Pre-Crisis (2005-07)

Dependent Variable: RETY2
Method: Least Squares
Included observations: 311
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.526395	1.492921	0.352594	0.72
SHPRICE	0.019887	0.020107	0.989078	0.32
OFRATE	0.2108	0.286673	0.735333	0.46
PE	-7.91E-05	7.92E-05	-0.997821	0.32
FYEDAYS	-0.000137	0.000466	-0.294344	0.77
STEX	-0.001235	0.126317	-0.00978	0.99
LOG(CAPT)	-0.055122	0.079653	-0.692019	0.49
LOG(1+AGE)	0.082384	0.041418	1.98908	0.05
PROFIT	0.001337	0.00038	3.521249	0.00
AUDIT	0.045462	0.112641	0.403607	0.69
UWRITE	0.08432	0.100474	0.839221	0.40

R-squared	0.042051	Mean dependent var	0.093235
Adjusted R-squared	0.01012	S.D. dependent var	0.797841
S.E. of regression	0.793794	Akaike info criterion	2.410744
Sum squared resid	189.0327	Schwarz criterion	2.543019
Log likelihood	-363.8706	Hannan-Quinn criter.	2.463616
F-statistic	1.316915	Durbin-Watson stat	1.800367
Prob(F-statistic)	0.220394	Wald F-statistic	3.627997
Prob(Wald F-statistic)	0.000141		

Table B21

OLS Regression Estimates for Pre-Crisis (2005-07)

Dependent Variable: RETY3
Method: Least Squares
Included observations: 311
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.330106	1.922447	-1.212052	0.23
SHPRICE	-0.012596	0.01813	-0.694754	0.49
OFRATE	0.352665	0.360323	0.978745	0.33
PE	-0.000116	8.96E-05	-1.292099	0.20
FYEDAYS	-0.000127	0.000477	-0.266025	0.79
STEX	0.071447	0.127258	0.56143	0.57
LOG(CAPT)	0.124385	0.101752	1.222429	0.22
LOG(1+AGE)	0.037075	0.05133	0.722299	0.47
PROFIT	0.001428	0.000404	3.538763	0.00
AUDIT	-0.155449	0.168456	-0.92279	0.36
UWRITE	0.034641	0.118452	0.292449	0.77

R-squared	0.029094	Mean dependent var	0.060024
Adjusted R-squared	-0.003269	S.D. dependent var	0.861247
S.E. of regression	0.862654	Akaike info criterion	2.577122
Sum squared resid	223.2514	Schwarz criterion	2.709398
Log likelihood	-389.7425	Hannan-Quinn criter.	2.629995
F-statistic	0.898984	Durbin-Watson stat	1.967282
Prob(F-statistic)	0.534458	Wald F-statistic	3.212393
Prob(Wald F-statistic)	0.000605		

Table B22

OLS Regression Estimates for Post-Crisis (2005-07)

Dependent Variable: RETDAY
Method: Least Squares
Included observations: 139
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.088974	0.194797	0.456753	0.65
SHPRICE	-0.001321	0.001708	-0.773614	0.44
OFRATE	-0.034612	0.036713	-0.942759	0.35
PE	-2.46E-06	1.42E-06	-1.737608	0.08
FYEDAYS	-2.27E-05	7.38E-05	-0.307915	0.76
STEX	-0.017663	0.020289	-0.870575	0.39
LOG(CAPT)	-0.005529	0.010766	-0.51358	0.61
LOG(1+AGE)	0.013868	0.007938	1.747088	0.08
PROFIT	0.001714	0.000746	2.297921	0.02
AUDIT	0.020503	0.0312	0.65715	0.51
UWRITE	0.037642	0.024424	1.541161	0.13

R-squared	0.07064	Mean dependent var	0.015052
Adjusted R-squared	-0.001967	S.D. dependent var	0.102739
S.E. of regression	0.10284	Akaike info criterion	-1.635458
Sum squared resid	1.353733	Schwarz criterion	-1.403233
Log likelihood	124.6643	Hannan-Quinn criter.	-1.541088
F-statistic	0.972912	Durbin-Watson stat	2.063815
Prob(F-statistic)	0.470257	Wald F-statistic	2.497915
Prob(Wald F-statistic)	0.008995		

Table B23

OLS Regression Estimates for Post-Crisis (2005-07)

Dependent Variable: RETWEEK
Method: Least Squares
Included observations: 139
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.126973	0.273076	0.464974	0.64
SHPRICE	-0.000994	0.002244	-0.442839	0.66
OFRATE	-0.051461	0.046513	-1.106372	0.27
PE	-5.88E-06	4.30E-06	-1.368307	0.17
FYEDAYS	-2.82E-05	0.00012	-0.234277	0.82
STEX	-0.028894	0.028426	-1.016473	0.31
LOG(CAPT)	-0.007443	0.013765	-0.540739	0.59
LOG(1+AGE)	0.016873	0.01197	1.409666	0.16
PROFIT	0.00309	0.00142	2.17596	0.03
AUDIT	0.019636	0.040378	0.48629	0.63
UWRITE	0.04955	0.035162	1.409206	0.16

R-squared	0.065173	Mean dependent var	0.022858
Adjusted R-squared	-0.00786	S.D. dependent var	0.148813
S.E. of regression	0.149397	Akaike info criterion	-0.888595
Sum squared resid	2.856875	Schwarz criterion	-0.656371
Log likelihood	72.75737	Hannan-Quinn criter.	-0.794225
F-statistic	0.892374	Durbin-Watson stat	2.087961
Prob(F-statistic)	0.542342	Wald F-statistic	1.279821
Prob(Wald F-statistic)	0.248514		

Table B24

OLS Regression Estimates for Post-Crisis (2005-07)

Dependent Variable: RETQUARTER
Method: Least Squares
Included observations: 139
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.001836	0.579294	0.003169	1.00
SHPRICE	-0.00343	0.004777	-0.718047	0.47
OFRATE	-0.134682	0.099062	-1.359578	0.18
PE	-3.20E-05	1.95E-05	-1.647424	0.10
FYEDAYS	0.00067	0.000255	2.628434	0.01
STEX	0.118141	0.059105	1.99885	0.05
LOG(CAPT)	-0.006936	0.032448	-0.21375	0.83
LOG(1+AGE)	0.008646	0.024657	0.350651	0.73
PROFIT	0.00572	0.002164	2.642786	0.01
AUDIT	0.024355	0.083625	0.291239	0.77
UWRITE	0.063124	0.072732	0.867907	0.39

R-squared	0.170413	Mean dependent var	0.053364
Adjusted R-squared	0.105601	S.D. dependent var	0.324331
S.E. of regression	0.306729	Akaike info criterion	0.550124
Sum squared resid	12.04256	Schwarz criterion	0.782348
Log likelihood	-27.23359	Hannan-Quinn criter.	0.644493
F-statistic	2.62936	Durbin-Watson stat	2.059705
Prob(F-statistic)	0.006063	Wald F-statistic	4.056152
Prob(Wald F-statistic)	0.000075		

Table B25

OLS Regression Estimates for Post-Crisis (2005-07)

Dependent Variable:
RETMONTH
Method: Least Squares
Included observations: 139
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.1642	0.246161	-0.667043	0.51
SHPRICE	-0.002598	0.002304	-1.127858	0.26
OFRATE	-0.047959	0.049545	-0.967992	0.33
PE	-5.64E-06	4.79E-06	-1.179405	0.24
FYEDAYS	7.08E-05	0.000124	0.571409	0.57
STEX	-0.014808	0.032192	-0.459971	0.65
LOG(CAPT)	0.005123	0.013693	0.374105	0.71
LOG(1+AGE)	0.016489	0.01257	1.311756	0.19
PROFIT	0.004668	0.002638	1.769895	0.08
AUDIT	0.048484	0.03861	1.255744	0.21
UWRITE	0.058218	0.038085	1.528629	0.13

R-squared	0.118083	Mean dependent var	0.015505
Adjusted R-squared	0.049183	S.D. dependent var	0.16282
S.E. of regression	0.158766	Akaike info criterion	-0.766945
Sum squared resid	3.226436	Schwarz criterion	-0.534721
Log likelihood	64.3027	Hannan-Quinn criter.	-0.672575
F-statistic	1.713833	Durbin-Watson stat	2.087434
Prob(F-statistic)	0.084247	Wald F-statistic	1.834349
Prob(Wald F-statistic)	0.060825		

Table B26

OLS Regression Estimates for Post-Crisis (2005-07)

Dependent Variable: RETY1
Method: Least Squares
Included observations: 139
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.226981	1.053196	-1.165007	0.25
SHPRICE	-0.022431	0.009306	-2.41044	0.02
OFRATE	-0.046222	0.189775	-0.243564	0.81
PE	-1.99E-05	2.19E-05	-0.908062	0.37
FYEDAYS	-0.000126	0.000371	-0.339749	0.73
STEX	-0.046074	0.118886	-0.387549	0.70
LOG(CAPT)	0.059067	0.060594	0.974798	0.33
LOG(1+AGE)	0.051376	0.049777	1.032135	0.30
PROFIT	0.011283	0.007096	1.590048	0.11
AUDIT	0.132553	0.126454	1.048228	0.30
UWRITE	0.324106	0.136428	2.375651	0.02

R-squared	0.13236	Mean dependent var	0.049687
Adjusted R-squared	0.064575	S.D. dependent var	0.615166
S.E. of regression	0.594973	Akaike info criterion	1.875227
Sum squared resid	45.31102	Schwarz criterion	2.107451
Log likelihood	-119.3283	Hannan-Quinn criter.	1.969597
F-statistic	1.952655	Durbin-Watson stat	2.199016
Prob(F-statistic)	0.043828	Wald F-statistic	2.899944
Prob(Wald F-statistic)	0.002666		

Table B27

OLS Regression Estimates for Post-Crisis (2005-07)

Dependent Variable: RETY2
Method: Least Squares
Included observations: 139
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.025421	1.229956	-2.459779	0.02
SHPRICE	-0.017955	0.012167	-1.475728	0.14
OFRATE	0.169799	0.232387	0.730677	0.47
PE	1.25E-05	2.32E-05	0.539456	0.59
FYEDAYS	-5.37E-05	0.000494	-0.108776	0.91
STEX	-0.106837	0.126757	-0.842849	0.40
LOG(CAPT)	0.136996	0.06821	2.008452	0.05
LOG(1+AGE)	0.058686	0.042899	1.367981	0.17
PROFIT	0.013765	0.009878	1.39354	0.17
AUDIT	0.183373	0.152521	1.202283	0.23
UWRITE	0.228589	0.15523	1.472582	0.14

R-squared	0.13268	Mean dependent var	-0.089794
Adjusted R-squared	0.06492	S.D. dependent var	0.65197
S.E. of regression	0.630451	Akaike info criterion	1.991068
Sum squared resid	50.87603	Schwarz criterion	2.223293
Log likelihood	-127.3793	Hannan-Quinn criter.	2.085438
F-statistic	1.958101	Durbin-Watson stat	1.86756
Prob(F-statistic)	0.043165	Wald F-statistic	2.584741
Prob(Wald F-statistic)	0.006934		

Table B28

OLS Regression Estimates for Post-Crisis (2005-07)

Dependent Variable: RETY3
Method: Least Squares
Included observations: 139
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.360775	1.903002	-2.291523	0.02
SHPRICE	-0.032813	0.016282	-2.015271	0.05
OFRATE	0.143753	0.367548	0.391113	0.70
PE	4.15E-05	2.24E-05	1.849784	0.07
FYEDAYS	0.000765	0.000912	0.838198	0.40
STEX	0.091137	0.20137	0.452587	0.65
LOG(CAPT)	0.217903	0.107	2.036477	0.04
LOG(1+AGE)	-0.058024	0.082706	-0.701574	0.48
PROFIT	0.011478	0.014273	0.804194	0.42
AUDIT	0.405026	0.414288	0.977643	0.33
UWRITE	0.086244	0.420108	0.205291	0.84

R-squared	0.078972	Mean dependent var	-0.003429
Adjusted R-squared	0.007017	S.D. dependent var	1.204796
S.E. of regression	1.200562	Akaike info criterion	3.279286
Sum squared resid	184.4926	Schwarz criterion	3.511511
Log likelihood	-216.9104	Hannan-Quinn criter.	3.373656
F-statistic	1.097519	Durbin-Watson stat	1.907094
Prob(F-statistic)	0.368985	Wald F-statistic	2.09169
Prob(Wald F-statistic)	0.029566		