2010

Tiered Market Structures: an Empirical Examination of NASDAQ

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"TIERED MARKET STRUCTURES:

AN EMPIRICAL EXAMINATION OF NASDAQ."

A Dissertation
Presented for the

Doctor of Philosophy

Degree

The University of Mississippi

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December 2009

Continued Listing Standards

ABSTRACT

This dissertation consists of two essays examining tiered market structures. We focus on the June 2006 restructuring of the NASDAQ Stock Exchange where the listing environment changed from two to three tiers, creating a top tier with the highest listing standards for any exchange in the world. The first essay examines market quality. Theoretical motivation indicates that different listing and disclosure requirements could result in different levels of information production across tiers, and thus different market quality characteristics. While we do find cross-sectional evidence of market quality differences, we do not find evidence of market quality changes when firms change tiers. Within the NASDAQ trading environment, this result is consistent with a visibility effect, where better (lesser) known stocks are more (less) liquid due to higher levels of investor participation. With the exception of increased effective spreads as firms drop to a lower tier, no other short-term changes in market quality appear to result from firms adhering to new listing standards, when controlling for disclosure standards.

The second essay examines any reputation effect resulting from NASDAQ's tiered structure. Theoretical motivation indicates that exchanges choose listing and disclosure standards to maximize the combination of its reputation value and the value of cash flows from listing and trading fees. We find that NASDAQ's 2006 restructuring did not appear to enhance its reputation, either directly or indirectly. The restructuring did not result in any positive

announcement effect for NASDAQ firms. Further, we find little evidence to support any announcement effects as firms cross into new tiers. Lastly, we find that the restructuring does not appear to have helped NASDAQ become more competitive in the marketplace for attracting new initial public offerings.

DEDICATION

This work is dedicated to my family and all of my close friends, whose tireless encouragement and support enabled me to complete this challenge.

ACKNOWLEDGMENTS

I want to thank my wife Polly for all of her support throughout this endeavor, as well as during all of our time spent together over the years. Without her help, I never could have achieved many of my professional goals, and this dissertation represents my most important professional achievement. She played a large role in my success.

Additionally, I want to thank my mother and father for setting great examples of working hard to achieve your goals in life. Through their encouragement and support, I've gone farther in life than I ever imagined. I can only hope to have the same effect on my children.

Finally, I'd like to thank my dissertation committee for their guidance, mentoring, patience, and understanding throughout this endeavor. Specifically, I want to thank Robert and Bonnie Van Ness for all of their help in guiding me throughout the doctoral program. Your support is greatly appreciated, and I aspire to follow the example you both set, both personally and professionally.

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INTRODUCTION

On February 15, 2006, NASDAQ announced the creation of a new market tier for publicly traded companies on the NASDAQ Stock Market. The newest tier, named the "NASDAQ Global Select Market," would have financial and liquidity requirements higher than any other market in the world. On June 26, 2006, a subsequent NASDAQ announcement specified the approximately 1,200 companies that qualified for the new market tier. Less than one week later, on July 3, 2006, the new listing structure took effect.

Bob Greifeld, NASDAQ President and Chief Executive Officer, promoted the new tier as "a blue chip market for blue chip companies." His announcement implies, at least in some manner, that NASDAQ's intent was to create a new, unique marketplace for blue chip companies. On the other hand, an article in MarketWatch pronounced that the new tier "means little" to investors (Jaffe, 2006). Furthermore, the article went on to state "the NASDAQ's designations are transparent and ultimately have more to do with marketing than markets (Jaffe, 2006)." Ultimately, whether or not NASDAQ's creation of the Global Select Market (GSM) represents the creation of a new trading environment, or is simply a meaningless re-designation of a pre-existing environment meant to enhance NASDAQ's reputation, is an empirical question.

Moreover, the creation of the new market tier leads to some interesting research questions. Why do tiered markets exist? Do exchanges create tiers in order to fill a need (or serve a niche) not currently served in the marketplace? Are the tiers uniquely different, or are their market frictions similar, and differ only through a "scale effect?" If uniquely different, what are the sources of these differences? Do exchanges create tiered

structures as a competitive reaction in the market for listings? If so, how does a tiered structure help an exchange become more competitive?

From an economic perspective, does the existence of tiered markets somehow represent a competitive response to maximize utility for an exchange? Jickling (2007) provides evidence that NASDAQ's listings have dropped 39% during the 1995-2006 timeframe. If tiered structures assist in attracting new listings (which produce higher listing fees) or new traders (which produce more commissions on trading volume), a tiered structure would maximize NASDAQ shareholders' wealth. Is the recent restructuring a response to a decade of declining listings, designed to maximize NASDAQ shareholders' wealth? More importantly, did it increase shareholder wealth?

The tiered restructuring presents an opportunity to conduct an empirical examination of NASDAQ's tiered market structure. If the tiers operate as unique trading environments, where the tiers exhibit material differences in trading frictions, this finding would provide support to a unique markets hypothesis, where Bob Greifeld's promotion of the new tier as "a blue chip market for blue chip companies" could be viewed as a legitimate attempt by NASDAQ to fill a perceived void (or serve a niche) in the marketplace for trading assets of blue chip companies.

Alternatively, if material differences are non-existent between the trading environments, this finding would support a reputation hypothesis. Chuck Jaffe's assertion that the new tier would "have more to do with marketing than markets" would posit that the real intent of Bob Greifeld's statement was that the GSM is "a blue chip market for blue chip companies." NASDAQ would appear to be outwardly marketing the merits of the newest tier for a reputation effect, when the trading environment would

exhibit similar trading frictions as the lower tiers. Further, the distinctions between the tiers would be arbitrary boundaries, drawn up by NASDAQ, meaning little to the average investor or prospective listing firm.

NASDAQ's tiered design enables multiple methods of empirical analysis. First, the tiers represent an opportunity to conduct a cross-sectional examination as different listing standards are applied to stocks that are all listed on the same exchange and trade on the same set of regional exchanges and alternative trading systems. Additionally, the tiered design allows for examining any potential impact when stocks migrate between tiers. An event study can be conducted when stocks cross these boundaries. Finally, the restructuring allows for an event study examining the effects of applying a new set of standards to existing stocks (i.e. re-designating stocks in a static setting, as opposed to stocks moving from one designation into another).

This dissertation examines NASDAQ's tiered structure. Essay One examines whether or not tiered structures are attempts to create unique trading environments by focusing on market quality characteristics for each tier. First, I examine a cross-section of market quality characteristics across market tiers. Next, I conduct a temporal examination when stocks migrate across tiers in order to identify any short-term changes in market quality. If significant differences exist, some firms could be at a competitive disadvantage because their cost of capital will be higher in one setting due to the differences in trading frictions. Potential differences in market quality would help explain firm decisions on moving up to a higher tier, down to a lower tier, conducting reverse stock splits, staying in place, or even changing the exchange on which they're listed.

Essay Two examines if tiered structures are an attempt by an exchange to enhance their reputation. Essay Two first determines whether NASDAQ had any indirect reputation effect resulting from the restructuring by determining whether or not any NASDAQ-listed stocks experienced positive abnormal returns around the time frame of the restructuring. The second part of the essay examines if the restructuring enhances NASDAQ's competitiveness in the marketplace for new listings by focusing on any impact on its ability to compete for new IPO listings with other U.S. exchanges.

ESSAY ONE

UNIQUE MARKETS? AN EMPIRICAL ANALYSIS OF MARKET QUALITY ACROSS THE NASDAQ TIERS.

CHAPTER 1

INTRODUCTION

NASDAQ's July 2006 restructuring resulted in a two-tiered marketplace being further subdivided into three tiers. In the case of NASDAQ's market structure, the creation of the newest tier could be viewed as an attempt to create a new trading environment. If the listing and disclosure requirements of a new tier result in the production of more precise information (resulting in better market quality for assets traded on that tier), and materially different types of firms being attracted to the tier as a result of this higher transparency, the new tier could be viewed a unique trading environment. This essay focuses on market quality differences across the tiers.

NASDAQ's tiered structure is by no means a unique phenomenon in the marketplace for trading securities. Within the U.S., the Chicago Stock Exchange (CHX) maintains a two-tiered structure. The Philadelphia Stock Exchange (PHLX) also maintained a two-tiered structure up until their 2007 acquisition by NASDAQ. Additionally, in March of 2006 the New York Stock Exchange (NYSE) created a tiered market setting with the establishment of the NYSE Arca, a new trading venue created after the NYSE-Archipelago merger was approved in December of 2005. The NYSE Arca provided smaller public companies (those not meeting the NYSE listing requirements) an opportunity to list with the NYSE Group.

However, these exchanges differ from NASDAQ in two important ways. First, the scale of the NASDAQ listing environment is much larger than NYSE Arca, CHX, and PHLX. NASDAQ is the primary listing exchange for over 3,000 firms. By comparison, as of the end of 2008, NYSE Arca had only 50 total listings, and CHX only

88 listings. Additionally, many of the CHX firms are dual-listed and have a primary listing on a different exchange. NYSE Arca is the primary listing exchange for only 33 of its 50 firms. CHX is the primary for only 2 of their 88. Since NASDAQ did not have a dual-listing program until 2004, only 11 of the 3,000+ NASDAQ-listed firms are dual-listed.

The second major difference is the distribution of listed firms across the tiers. NASDAQ-listed stocks are somewhat evenly distributed across the NASDAQ tiers, with each tier having significant representation (currently 1,222 on the Global Select, 1,116 on the Global, and 497 on the Capital). NYSE Arca and CHX have the vast majority of their stocks listed on their highest tiers (84% and 94%, respectively).

More recently, Pink Sheets, LLC developed a two-tiered listing service for over-the-counter securities called OTCQX. Pink Sheets designed this listing service primarily for a) existing OTC-traded domestic companies seeking premium status, b) smaller companies currently listed on a national exchange that are voluntarily delisting but still desiring secondary market liquidity and transparency, c) venture-backed growth companies who do not yet qualify for an exchange listing, and d) foreign-listed companies seeking access to the U.S. equity markets.

Pink Sheets has two tiers. The higher tier, called the PremierQX, is for issuers of size and quality adequate for listing on a national stock exchange. The lower tier, called the PrimeQX, is for issuers with audited financials, but not of sufficient size to be listed on the PremierQX. Combined, these two tiers will consist of approximately 25% of the stocks formerly traded on both the OTCBB and Pink Sheets.

Outside of the U.S., a number of prominent exchanges operate tiered listing structures similar to NASDAQ and OTCQX. For example, the London Stock Exchange (LSE) operates a main market for established companies and the Alternative Investment Market (AIM) for small international companies. The AIM is unique among trading environments in that it essentially has no listing requirements. AIM does not require companies to have a particular financial track record or trading history, and no minimum requirements exist on the AIM for firm size or the number of shareholders (London Stock Exchange, 2008).

Similarly, the TSX Group in Canada operates a two-tiered marketplace. The Toronto Stock Exchange is the tier for well-managed, larger companies, but the Toronto Stock Exchange also lists a number of exchange-traded funds, income trusts, and investment funds. The TSX Venture Exchange is a tier for emerging companies (Toronto Stock Exchange, 2008). The TSX Venture Exchange, formerly known as the Canadian Venture Exchange, provides the capital-raising infrastructure for small and medium-size firms.

Other examples of foreign exchanges with tiered structures include the Frankfurt Wertpapierbörse (FSE) and the Johannesburg Stock Exchange (JSE). The FSE operates two official market segments, and a third "unofficial" tier (called the Open Market) that does not represent an organized or regulated market (Frankfurter Wertpapierbörse, 2008). Lastly, the JSE operates three tiers consisting of their Main Board, a Venture Capital Market, and a Development Capital Market (Johannesburg Stock Exchange, 2008).

In my analysis of the NASDAQ market structure, the findings are not consistent with the idea that the NASDAQ's tiered listing environment represents the creation of unique trading environments between the tiers. While I do find market quality differences among the tiers in the cross-section analysis, the differences appear to result either from a long-term effect due to disclosure requirements or a visibility effect, rather than simply from new listing standards being applied.

A short-term analysis of immediate changes in market quality fails to detect any material changes in the 20 trading days immediately after a firm switches tiers. This short-term trading period represents the time frame when the new listing standards are being applied to the firms, and the information contained within those listing standards is being revealed to the investing public for their use in more accurately pricing those stocks. If a long-term impact does exist (which is not tested in this essay), the impact could result from the disclosure process and/or from a visibility effect. The evidence is consistent with the notion that as firms become better known by investors, additional institutional trading and analyst coverage make trading in those assets more transparent, thereby resulting in market quality differences between the NASDAQ tiers.

CHAPTER 2

NASDAQ STRUCTURE

On July 3, 2006, the NASDAQ Stock Exchange listed over 3,000 companies (down to 2,835 at the end of 2008). The companies are divided over NASDAQ's three tiers, with each tier's composition being distinguished by its initial and continued listing requirements. Firms are required to meet the initial listing requirements, and to maintain the continued listing requirements, in order to be included on a specific tier. The Global Select Market has the highest listing requirements, followed by the Global Market, and then the Capital Market. The distribution of stocks across the NASDAQ tiers is shown in Table 1-1.

This current structure results from a 2006 restructuring in which NASDAQ created a third tier with the "highest listing standards in the world" (NASDAQ Press Release, 2006). The newest tier resulted from NASDAQ subdividing their formerly named NASDAQ National Market into the new Global and Global Select Markets. Meanwhile, the NASDAQ Smallcap Market was simply renamed the NASDAQ Capital Market.

NASDAQ specifies the characteristics that distinguish the three tiers of stocks in their NASDAQ Listing Requirements. The listing requirements identify the financial and liquidity characteristics required for trading on a specific tier. Appendices A and B provide the initial and continued listing standards for each tier at the time of the restructuring. Each trading day, when companies fail to meet a listing requirement, NASDAQ posts a list of non-compliant companies on its website. The listing indicates

the issuer name, the listing deficiency, the market on which the asset trades and the date NASDAQ initially notified the firm of the delinquency.

NASDAQ does not have its own unique disclosure requirements. While disclosure requirements are outlined in the NASDAQ Listing Rules, NASDAQ enforces the routine reporting requirements of the Exchange Act and the disclosure requirements of Regulation FD. Private conversations with NASDAQ indicate that their exchange enforces these reporting and disclosure requirements for NASDAQ-listed firms.

NASDAQ has a team of analysts responsible for policing the reporting and disclosure of firms listed on their exchange. Each of their analysts is assigned up to 200 firms to monitor. The analysts are responsible for verifying that firms meet, and continue to meet, the initial and continued listing requirements for the tier to which they are assigned. Additionally, analysts monitor when the listed firms are required to disclose routine information such as quarterly and annual reports, earnings and dividend announcements, etc.

Whenever the company fails to meet a mandated disclosure timeline, the analysts are responsible for notifying the listed firm to inquire into the nature of the delay. NASDAQ may require the firm to conduct a press release notifying investors of the delay, as well as disclosing any information about the delay that may be material in accurately pricing their stock trading on NASDAQ. If the firm fails to comply, NASDAQ could take measures ranging from initiating/extending trading halts to delisting the firm.

CHAPTER 3

THEORETICAL MOTIVATION

Chemmanur and Fulghieri (2006) propose a theoretical framework that may explain the presence of tiered market structures. Exchanges use disclosure and listing standards as a means to aid investors in the production of information that is useful in accurately pricing assets traded in their marketplace. Listing standards enable exchanges to screen potential listings for their exchange, and to apply stringency when investigating and enforcing disclosure requirements of those listed firms.

In the case of NASDAQ, the disclosure and listing standards provide the public information on each firm's size, earning power, and governance, as well as the overall level of public interest in the firm's stock. As a result, the listing and disclosure requirements help a) monitor listing firms and b) enhance the precision of information made available to outsiders when evaluating those firms. Thus, NASDAQ's listing and disclosure requirements may enhance the precision of information made available to outsiders when evaluating NASDAQ-listed firms, and could result in more a transparent marketplace.

Higher listing and disclosure standards do come at a cost to the exchange though. If the exchange sets high listing standards, the exchange reduces the number of firms that will qualify for listing. This smaller pool of potential firms reduces the expected cash flows (from the listing fees) that serve as a major source of revenue for the exchange. Additionally, the smaller number of qualifying firms reduces the revenue generated through individual transactions in the marketplace as assets exchange hands (Chemmanur and Fulghieri, 2006; Easley and O'Hara, 2007). Likewise, higher disclosure standards

may cause the exchange to incur "greater verification and regulatory costs to verify and regulate disclosures made by these firms (Chemmanur and Fulghieri, 2006)."

Within this context, the exchange faces a trade-off between a) the value resulting from a higher reputation and b) the value of expected cash flows from firms listing on the exchange. The optimal listing standards would maximize the combination of these two offsetting values. Figure 1-1 shows this relation.

Under Chemmanur and Fulghieri's theoretical framework, the creation of a new tier could be treated as the creation of a new trading environment. If the listing and disclosure requirements of a new tier attract materially different types of firms to each tier, and distinctly different liquidity and transparency characteristics when compared to pre-existing tiers, the new tier could be viewed as a unique trading environment resulting in true differences in market quality. In this case, the unique trading environment could result in market quality differences such as transaction costs, order flow patterns, price discovery, and price efficiency. This "Unique Markets Hypothesis" may explain NASDAQ's motivation for a tiered market structure.

While Chemmanur and Fulghieri's framework addresses both disclosure and listing requirements, prior research focused solely on the relationship between disclosure and liquidity. Welker (1995), Healy et al. (1999), and Leuz and Verrechia (2000) all find positive relationships between disclosure and liquidity, but their studies focus solely on transaction costs. Heflin et al. (2005) also find a positive relationship between disclosure and liquidity. Their study further examines the disclosure-liquidity relationship by examining both transaction costs and depth.

Frost and Botosan (1997) study the relationship between the disclosure environment and liquidity of non-US firms listed on NYSE, NASDAQ, and the OTCBB from 1994-1996. While they find that less regulation and fewer disclosure requirements result in lower liquidity, their study has a joint hypothesis problem. Their study fails to isolate the liquidity effects resulting from a) regulation/disclosure requirements, b) listing requirements, and c) the effects of three different market microstructure environments. Frost et al. (2006) examine the relationship between disclosure requirements and liquidity in 50 exchanges around the world. They find that stronger disclosure systems are related to higher levels of liquidity. This study also suffers from a joint hypothesis problem in that the 50 exchanges have both different trading environments and different listing requirements.

Chavez and Silva (2006) study the liquidity impact when the Sao Paulo Stock Exchange created three special listing segments where firms could choose to voluntarily adhere to progressively higher corporate governance rules, above and beyond the requirements set forth by current legislation in Brazil. While corporate governance rules are distinctly different from disclosure rules, the strictest segment of the Sao Paulo Stock Exchange, the Novo Mercado, requires firms to have financial statements prepared in accordance with International Accounting Standards or GAAP. This requirement results in the Novo Mercado having higher disclosure standards than the other two special segments.

Their study finds that liquidity increases (i.e. transaction costs decreased) when firms move onto the special segments. This study also has a joint hypothesis problem in that it did not take into consideration any potential visibility effects when firms elect to

move onto the special listing segments. Moreover, the study consists of only 62 firms, and it did not test for any liquidity changes for the firms choosing not to list in the special segments.

While Chemmanur and Fulghieri's framework does not propose separate effects for listing requirements versus disclosure requirements, Draus (2009) proposes a separate framework where an exchange can improve the liquidity of assets which trade on its exchange by tightening its listing requirements. The tightening of listing requirements reduces information asymmetry about a firm and increases the firm's liquidity. The reduced asymmetry and higher liquidity lead to higher levels of investor participation for the firm's assets in the marketplace, as investors seek to trade in locations where the expected utility from participating exceeds the opportunity costs of participating. Draus' theoretical model focuses on the initial listing decision of firms, where the initial listing and disclosure requirements occur simultaneously. Thus, the framework also fails to propose separate effects for listing requirements versus disclosure requirements.

Lastly, Merton's (1997) investor attention hypothesis provides an alternate, but not mutually exclusive, scenario where the different NASDAQ tiers may produce varying levels of investor knowledge about securities. Consequently, as investor participation differs across tiers, the liquidity of assets on those tiers may vary. This visibility effect could be present regardless of whether or not any listing and/or disclosure effect occurs.

Using these theoretical motivations, this essay contributes to the literature by focusing on the relationship between listing standards and market quality. NASDAQ's unique, tiered structure allows for a natural experiment where any potential liquidity

effect resulting from listing standards can be isolated, while controlling for other possible explanations.

Using firms listed on NASDAQ's tiered structure ensures that all stocks trade on similar market structures (e.g. such as dealer vs. auction, floor-based vs. electronic, or quote vs. order-driven). The tiers have the same trading rules, such as short-sale price tests, different treatment of limit orders, or opening/closing procedures. Though participation levels may vary across tiers, all NASDAQ tiers have the same potential competitors for order flow, such as alternative trading systems and regional exchanges, through unlisted trading privileges.

The only distinguishable trading rule that differs among the tiers is the "bid-test" rule for short sales. The bid-test, implemented in 1994 and eliminated in 2007, restricted short-selling when the current inside bid price is lower than the previous inside bid price. After NASDAQ's restructuring, orders for Global Select Market (GSM) and the NASDAQ Global Market (NGM) stocks adhered to the bid-test rule from July 2006 until Oct 2007, whereas orders for NASDAQ Capital Market (NCM) stocks were exempt from the bid-test rule.

In addition, the bid-test rule only applied to GSM and GS trades that occurred on NASDAQ. The regional exchanges and alternative trading systems that compete for order flow in NASDAQ stocks are not required to abide by the bid-test rule. A review of the trading rules for regional exchanges and alternative trading systems indicates these markets did not have their own bid-test rule in place (or any other rules that distinguish trading activities between NASDAQ's tiers).

McCormick and Reilly (1996) examine the economic impact of NASDAQ's bid-test rule on market quality by examining short-selling activity of market participants on NASDAQ National Market stocks (now GSM and NGM). They find more short-selling during upward price movements than during downward price movements, thereby implying that the bid-test rule reduces short-selling during price declines. However, they do not find market quality differences between short sales on up-bids and down-bids, nor do they find differences between exempt and non-exempt short sales. As a result, they conclude that the bid-test rule reduces short-selling activity during price declines without decreasing market quality. A follow-on study by McCormick and Zeigler (1997), using different proxies for market quality, validate the findings of McCormick and Reilly (1996). They also find that market participants rarely use their bid-test exemption.

Ferri, Cristophe, and Angel (2004) study the bid-test rule and find that the bid test has little effect on short order execution. They find that SmallCap (now NCM) stocks have less short selling than National Market stocks (now GSM and NGM), even though they are not constrained by the bid-test rule. Additionally, they find that abnormal short selling in SmallCap stocks (no bid-test constraint) does not result in more price declines than with matching National Market stocks (bid-test constrained). Thus, the absence of a bid-test, even when combined with abnormal short selling, doesn't materially impact market quality.

Recent studies on Regulation SHO, the SEC's temporary suspension of price-tests (for a set of pilot securities) during the period of May 2, 2005 to April 28, 2006, indicate that the bid-test has little to no impact on NASDAQ's market quality. In an analysis of short trades on NASDAQ, Alexander and Peterson (2008) find that the bid test is

"relatively inconsequential" and does not materially degrade market quality on NASDAQ. Another study indicates that NASDAQ's bid-test impact on market quality can be largely attributed to the distortions in order flow created by the price-tests (Diether, et al, 2009). Thus, the only trading rule difference among the tiers appears to have little to no impact on making the tiers unique.

CHAPTER 4

HYPOTHESES

All three NASDAQ tiers have the same disclosure requirements, trade in the same market structure, under virtually the same trading rules, and on the same mix of marketplaces (through unlisted trading privileges). At first glance, it does not appear as if NASDAQ uses a tiered structure to create unique trading environments, and especially for the purpose of filling any void in the marketplace. On the other hand, NASDAQ's tiers have similar, but not identical, listing requirements.

Under the theoretical framework of Chemmanur and Fulghieri (2006), the different listing requirements for each tier may attract different types of firms, thereby resulting in different levels of information being revealed as different types of firms are attracted to each tier. Likewise, the "continued listing" requirements may also result in different levels of transparency. As firms routinely disclose information along these continued listing characteristics (in order to maintain their status within a tier), information is regularly produced. These disclosures may lead to different transparency characteristics.

This essay first conducts a cross-sectional analysis, and then a temporal analysis as stocks move to a different tier (facing different listing standards) within the same trading environment. Thus, the following null and alternate hypotheses are tested:

H_0: The NASDAQ tiers exhibit the same market quality characteristics (i.e. they are not unique markets).

H_{A1}: The NASDAQ tiers exhibit different market quality characteristics (i.e. they are unique markets).

Foucault and Parlour (2004) propose an argument that implies NASDAQ's tiers may be unique. They argue that competing exchanges choose a trading structure (technology) and listing fees in order to maximize "its listing revenue and trading revenue." The NASDAQ tiers all use the same trading structure (a quote-driven, electronic, dealer market), so the trading structure shouldn't be a source of uniqueness among the NASDAQ tiers under the Foucault and Parlour framework. On the other hand, the "listing revenue and trading revenue," analogous to the "value of expected cash flows" from firms listing on the exchange under the Chemmanur and Fulghieri (2006) framework, provides yet another possibility.

A review of NASDAQ's listing fee structure for both initial and continued listing indicates the same listing fees for the GSM and NGM, but a different fee structure for the NCM (both initial and continued are significantly lower). Thus, the listing fee structure could be a source of market quality differences through attracting different types of firms that differ in how much they value a decrease in trading costs (Foucault and Parlour, 2004). This potential source of market quality uniqueness indicates that the NCM may indeed exhibit market quality differences from the GSM and the NGM, but that the GSM and NGM are similar (note: the listing fee structure did not change over the course of the sample period). Thus, the following alternate hypothesis will also be tested:

H_{A2}: The NASDAQ Global Select and Global Markets exhibit similar market quality characteristics, but exhibit different market quality characteristics than the Capital Market (i.e. the NCM is uniquely different from the GSM and NGM).

Merton's (1987) investor attention hypothesis implies that the tiers may exhibit different levels of visibility since larger firms are followed by more investors than smaller firms. This larger investor base could result in market quality differences due to different levels of investor participation. Thus, market quality differences may result from factors unrelated to listing standards, or in addition to listing standards. Therefore, the following hypotheses will test for any relationship between listing standards and liquidity, after controlling for any possible visibility effect:

H_{A3}: After controlling for common listing characteristics and visibility differences, the NASDAQ tiers exhibit different market quality characteristics (i.e. they are unique markets).

CHAPTER 5

DATA SOURCES

This essay uses two data sets. The cross-sectional data set consists of all stocks listed on NASDAQ over the 90 calendar days immediately after the restructuring. The three data sources are the Center for Research in Security Prices (CRSP) database, Standard & Poor's Compustat North America database, and the Rule 605 data set.

The CRSP database serves as the primary data source for identifying all NASDAQ-listed stocks, as well as to which tier they are assigned. Standard & Poor's Compustat North America database serves as a second data source. Compustat provides the firm-specific data for use in evaluating firms against the NASDAQ listing requirements. This portion of the data set is used to control for any listing characteristics common to all three NASDAQ tiers (i.e. any characteristics NASDAQ uses to artificially sub-divide their marketplace).

SEC-mandated Rule 605 data serves as the third data source for the cross-sectional dataset. The SEC requires market centers trading NMS securities to report order execution quality data under the SEC's Rule 605 of NMS (formerly known as Exchange Act Rule 11Ac1-5). This data is made publicly available through the Transaction Auditing Group, Inc., and requires market centers to submit monthly electronic reports about their quality of executions on a stock-by-stock basis. This portion of the data set provides the dependent variables measuring market quality. Since Compustat provides quarterly data, and Rule 605 data provides monthly data, all market quality measures using the Rule 605 data will also require conversion to quarterly

measurements using both equally-weighted and value-weighted calculations. The initial data set consists of 2,667 firms.

The second data set to identify any immediate changes in market quality resulting from stocks moving into a new tier. This data set consists of all stocks listed on NASDAQ for a 30-month period (from July 2006 until Dec 2008) after the restructuring. Three data sources are used to create the data set for this analysis, CRSP, the SEC's EDGAR database, and the NYSE's Trade and Quote (TAQ) database.

CRSP is utilized to identify companies that move between tiers, and to identify the timeframe of the listing change. The SEC's EDGAR database will identify the implementation dates of firms moving into a new tier. TAQ contains intraday transactions data (trades and quotes) used to calculate daily observations of the Rule 605 market quality characteristics. The second dataset consists of 158 stocks that switched tiers during this timeframe, with 84 rising to a higher tier, and 74 dropping to a lower tier.

CHAPTER 6

METHODOLOGY

Numerous measures of market quality are used in the microstructure literature, including such measures as spreads, depth, volatility, price impact, price efficiency, market efficiency, execution speed, order flow fragmentation, speed of price adjustment, locked/crossed markets, and market quality index (Theobald & Yallup, 2004; Bennett & Wi, 2006; Zhao & Chung, 2007; Eom et al, 2007; Hendershott & Jones, 2008; Alexander & Peterson, 2008; Shkilko et al, 2008). Rule 605 contains market quality characteristics on spreads (effective and realized), rate of price improvement, amount of price improvement, and fragmentation of order flow. This study focuses on these measures of market quality.

For the cross-section analysis, the following measures of market quality are analyzed:

1. Dependent Variables (Market Quality Characteristics):
    a. Percentage Average Effective Spread (Eff Spr): Measures the cost traders bear when buying or selling an asset. Defined in Rule 605 (paragraph (a)(2)) as the share-weighted average of effective spreads for order executions, calculated for sell (buy) orders as double the amount of difference between the best bid and offer midpoint (execution price) at the time of order receipt and the execution price (midpoint). Quarterly measures of the percentage average effective spread will be calculated for each stock using both equally and value-weighted approaches, and

separately for market, marketable limit, inside-the-quote limit, at-the-quote limit, and near-the-quote limit orders.

b. Percentage Average Realized Spread (Real Spr): Measures the revenue to the providers of liquidity. Defined in Rule 605 (paragraph (a)(3)) as the share-weighted average of realized spreads for order executions, calculated for sell (buy) orders as double the amount of difference between the best bid and offer midpoint (execution price) five minutes after the time of order execution and the execution price (midpoint). Quarterly measures of the percentage average realized spread will be calculated for each stock using both equally and value-weighted approaches, and separately for market, marketable limit, inside-the-quote limit, at-the-quote limit, and near-the-quote limit orders.

c. Price Improvement Rate (PI Rate): Measures the percentage of shares executed with price improvement. Quarterly measures of the price improvement rate will be calculated for each stock using both equally and value-weighted approaches, and separately for market, marketable limit, inside-the-quote limit, at-the-quote limit, and near-the-quote limit orders.

d. Price Improvement Amount (PI Amt): Measures the average amount per share, as a percent of share price, that prices were improved for orders with price improvement. Quarterly measures of the price improvement amount will be calculated for each stock using both equally and value-weighted approaches, and separately for market, marketable limit, inside-the-quote limit, at-the-quote limit, and near-the-quote limit orders.

e. Order Flow Fragmentation (HHI): Measures the concentration of order flow across all major market centers. Quarterly measures of order flow fragmentation will be calculated for each stock using the Herfindahl-Hirschman Index (HHI). The HHI will be calculated using both equally and value-weighted approaches, and separately for market, marketable limit, inside-the-quote limit, at-the-quote limit, and near-the-quote limit orders. HHI is defined as:

$$HHI = \sum_{i=1}^{n} S_i^2$$

where S_i is the market share of each major market.

Appendices A and B show the initial and continued listing standards for each tier in effect when NASDAQ created the NGM and GSM. For the most part, the listing standards for the higher tiers simply appear to be higher thresholds along similar criteria used for the lower tiers. A close look at the listing standards shows that, in almost every scenario, any firm meeting the listing requirements for a higher tier would also meet the listing requirements for any lower tier(s).

Initially, all NASDAQ stocks appear to comprise one single population of stocks that meet the bare minimum NASDAQ listing standards (of the NASDAQ Capital Market). The listing requirements for the upper tiers may simply create subsets of the overall population of NASDAQ stocks (rather than creating uniquely different sets of stocks). Thus, the tiers may reflect larger, more profitable, and more liquid firms consolidating onto the higher tiers, whereas smaller, less profitable, and less liquid firms consolidating onto the lower tiers.

On the other hand, subtle differences do exist in the listing requirements that provide an opportunity to test Chemmanur and Fulghieri's framework. For instance, Net Cash Flows (from operations), Total Revenue, Total Assets, and Shareholders' Equity are characteristics used for at least one tier, but not for all tiers. Likewise, liquidity characteristics such as Volume and Market Value of Public Shares are not consistent across all tiers. As a result, the listing standards consist of some common, and some unique, listing requirements.

In order to test market quality differences across tiers resulting from the listing standards, I must first control for any common listing characteristics used by NASDAQ to subdivide the tiers. An examination of the listing standards shows five characteristics that are common across tiers, where NASDAQ simply applies increasing thresholds of those criteria for inclusion on a higher tier. These characteristics are stock price, number of registered market makers, stockholders' equity, number of publicly held shares, and the market value of publicly held shares. Since these criteria reveal the consistent information across tiers, they will form a vector of control variables when searching for true market quality differences across tiers.

2. Vector of Control Variables –
    a. Bid Price (PRC): The bid price is the price per share at which market makers will purchase the stock (sourse is CRSP, "PRC"). CRSP provides daily measures, so the end of period bid price will be used.
    b. Market Makers (MMCNT): The number of market makers is the number of registered market makers for the issue (sourse is CRSP, "MMCNT").

CRSP provides daily measures, so the end of period market maker count will be used.

c. Stockholders' Equity (SE): The stockholders' equity is the total common and preferred shareholders' interest in the company, and includes: capital surplus, common/ordinary stock, redeemable and nonredeemable preferred stock, retained earnings, and treasury stock (source is Compustat, "Stockholders' Equity - Total"). Compustat provides quarterly measures of the Stockholders' Equity for each issue, measured in millions, that corresponds to the period end date.

d. Shares Outstanding (SHROUT): Represents the number of publicly held shares (source is CRSP, "Shares Outstanding - Adjusted"). CRSP provides daily measures of the Number of Shares Outstanding, measured in thousands, for each issue, that corresponds to the period end date.

e. Market Value of Public Shares (MktVal): Represents the combined market value of all publicly held shares, calculated by multiplying quarterly measures of [Bid Price * Publicly Held Shares].

Since NASDAQ has three tiers, the cross-section methodology will treat the middle tier (NGM) as the base case, and use dummy variables to capture any market quality differences for the upper (GSM) and lower (NCM) tiers. If any regression coefficients for the variables are significantly different than zero, the coefficient will represent the shift upward (downward) from the base case on each market quality characteristic if the coefficient is positive (negative).

3. Variables of Interest –
    a. Global Select Market (GSM): Dummy variable equal to 1 if the stock is listed on the Global Select Market, and 0 otherwise.
    b. NASDAQ Capital Market (NCM): Dummy variable equal to 1 if the stock is listed on the NASDAQ Capital Market, and 0 otherwise.

A finding of the variables of interest being significantly different than zero would provide initial support that the tiered structure of NASDAQ may result in different levels of market quality, even after controlling for the variables NASDAQ uses to divide their marketplace. In contrast, a pattern of findings that the GSM stocks have lower spreads, greater levels of price improvement, and more fragmented order flow (with the converse for all being true for the CM) supports a scale effect.

For further examination, I employ an event study methodology to test for changes in market quality when a stock moves from one tier to another (firms identified as changing tiers from July 2006 – Dec 2008). A total of 158 firms switch tiers during this timeframe. This event study analysis helps clarify support for or against any unique market characteristics as firms slide across these tier boundaries. In essence, the cross-section looks at all firms listed on each tier at a point in time, whereas the event study focuses on firms at the margins (those at the top of a lower tier, or at the bottom of a higher tier), as they cross from one tier onto another. If market quality changes around the event day, this finding would indicate strong support for a "unique markets hypothesis." On the other hand, failure to find any market quality changes only fails to shows a short-term market quality impact. It would still leave open the possibility for a long-term change in market quality.

For this analysis, I will use TAQ data to construct daily measures of the market quality characteristics, and then calculate equal and value-weighted averages for all firms on a specific tier for comparison. The daily measures will be calculated as follows:

Percent Effective Spread (EffSpread) for security *i*:

$$EffSpread_i = \frac{\sum_{n=1}^{N}\left(2 * I_{trade}\left(\Pr ice_{i,t} - M_{i,t}\right) \Big/ \Pr ice_{i,t}\right)}{N}$$

where I_{trade} is the trade direction indicator (1 for buys and -1 for sells) and $M_{i,t}$ is the quote midpoint at the time of the trade. The daily observations for each stock will be calculated using both equally and value-weighted measures.

Percent Realized Spread (RealSpread) for security *i*:

$$RealSpread_i = \frac{\sum_{n=1}^{N}\left(2 * I_{trade}\left(\Pr ice_{i,t} - M_{i,t+5}\right) \Big/ \Pr ice_{i,t}\right)}{N}$$

where I_{trade} is the trade direction indicator (1 for buys and -1 for sells) and $M_{i,t+5}$ is the quote midpoint 5 minutes after the trade. The daily observations for each stock will be calculated using both equally and value-weighted measures.

Price Improvement Amount (PI Amt) for security *i* is defined as the average price improvement, measured as a percent of share price, for shares trading within the posted national best bid and ask prices at the time of execution.

$$PIAmt_i = \frac{\sum_{t=1}^{T}\left[I_{trade}\left(\Pr ice_{i,t} - Quote_{i,t}\right) \Big/ \Pr ice_{i,t}\right]}{N}$$

Price Improvement Rate (PI Rate) for security *i* is defined as the percentage of shares trading within the posted national best bid and ask prices at the time of execution. Daily observations will be calculated for each stock:

$$PIRate_i = \frac{\#Shares_{i,w/PriceImprovement}}{\#Shares_{i,Total}}$$

where I_{trade} is the trade direction indicator (1 for sells and -1 for buys), $Quote_{i,t}$ is the Bid (Ask) price for sell (buy) orders, and n is the total number of trades during the trading day.

Herfindahl-Hirshman Index for security *i* is defined as the measure of order flow concentration across exchanges for each stock:

$$HHI_i = \sum_{i=1}^{n} \left(\frac{S_i}{S_{Total}} \right)^2$$

where S is the share volume that occurs on Market *m* during the trading day.

I examine changes in market quality over the 41 trading days surrounding the tier change (20 days before, the event day, and 20 days after). I use the implementation date as shown on CRSP, or in the SEC filings listed on the EDGAR database when CRSP data was missing. I omit trades and quotes if the data indicates that they are out of time sequence or involve either an error or a correction. I also omit quotes if the ask and/or bid prices are equal to or less than zero, and I omit any trades where the price and/or volume is equal to or less than zero.

Lastly, I test for market quality differences resulting from a visibility effect under Merton's investor attention hypothesis. I use two proxies for visibility, analyst coverage and institutional investing.

4. Visibility Variables –
    a. Institutional Percent (INST): The institutional percent represents the percent of total volume from institutional investors, measured as volume in the largest trade size category (5,000-9,999 shares) in the Rule 605 data.
    b. Analysts Estimates (Analysts): The analyst estimates represents the number of analysts reporting earnings estimates in the Institutional Brokers' Estimate System (I/B/E/S) database for the period of July-September 2006.

CHAPTER 7

RESULTS

Table 1-2, Panel A provides a descriptive analysis on the size of NASDAQ's three tiers, the types of firms listed on each, and the market quality characteristics for each tier. First, note that the GSM and NGM are both over twice as large as the NCM. Both tiers have over 1,000 firms listed on each throughout the 90-day sample period. In contrast, the NCM has fewer than 500 firms listed. The firm characteristics indicate, as expected by the nature of NASDAQ's listing characteristics, when moving from the lowest tier (NCM) to the highest (GSM), firms become larger, have a higher public float, have greater amounts of contributed capital, more dealer interest, and higher stock prices. When firm size is measured by the market value of publicly held shares, the average GSM firm is over ten times as large as a NGM firm, and almost 30 times as large as the average NCM stock. Stockholders' Equity shows a similar relationship.

The disparity is much smaller when considering the number of registered market makers for each stock. GSM stocks show, on average, only twice as many registered market makers as stocks on the lowest tier (NCM). While the number of registered market makers indicates the quantity of market makers capable of participating in order flow for a particular stock, it doesn't necessarily represent the level of active participation in each stock.

Panel B shows the results of tests for differences in firm characteristics between the tiers. The OLS regressions use the Global Market as the base case, with dummy variables distinguishing the Capital and Global Select Markets. The analysis indicates

the tiers are distinguished from one another along the firm characteristics used to subdivide the population of NASDAQ-listed stocks. NCM stocks are significantly lower priced and have fewer market makers than NGM. GSM stocks have significantly higher priced stocks, more market makers, greater contributed capital (stockholders' equity), larger public floats, and larger market values than NGM stocks. All five OLS regressions are significant, but they explain very little of the variation in firm characteristics among the tiers.

Panel C provides a descriptive analysis of the market quality characteristics across tiers. The market quality characteristics obtained using the Rule 605 data indicate that, when moving from the lowest tier (NCM) to the highest (GSM), effective spreads fall, the price improvement percent decreases, the rate of price improvement decreases, and trading becomes more fragmented across major market centers. The only market quality characteristic not showing a clear pattern of trending up or down is realized spreads. Realized spreads are lowest on the NCM, and highest on the NGM.

The initial analysis indicates that the tiers exhibit a market quality tradeoff as you move from the lowest to the highest tier. Effective spreads fall, indicating enhanced market quality. Yet, price improvement declines and trading becomes more fragmented, indicating decreased market quality. These results are consistent with the notion that as stocks become more heavily traded, increased competition for order flow narrows spreads and reduces opportunities for price improvement, both as a percent of stock price and in rates of occurrence.

The initial finding of realized spreads not demonstrating a clear pattern of decreasing as you move from the NCM to the GSM is somewhat surprising. The

descriptive analysis indicates that realized spreads are highest on the middle tier (NGM), and lowest on the bottom tier (NCM). This result may indicate that quoting in stocks on the lowest tier may be reactive, whereas quoting in stocks on the highest tier may be proactive. On the lowest tier, relatively few market makers competing for order flow could adjust their larger spreads after trades occur, when the competition to obtain those orders is relatively light. On the other hand, market makers on the highest tier would have to proactively adjust their smaller spreads in order to attract order flow. As a result, realized spreads would be highest in the middle of the market where trades occur frequent enough for prices to be relatively efficient, but not so frequently that they face high competition and tight spreads (at the top), or so infrequently that dealers can manage risk by maintaining wider spreads (at the bottom).

To test if NASDAQ's listing structure produces unique information across tiers, I must first control for any similar information being produced across tiers. Table 1-3 shows the results of a correlation analysis to determine if a relation exists between the common listing standards for all three tiers and the five measures of market quality. The correlation table indicates that all five of the control variables are negatively correlated with the NCM dummy variable, indicating lower-priced stocks, smaller companies with smaller public floats, and fewer registered market makers than the base case (NGM). All of the control variables are positively correlated with the GSM dummy variable, indicating higher-priced stocks, larger companies with larger public floats, and more registered market makers than the base case (NGM). All correlations are statistically significant at the α=.01 level of significance. All of the control variables also show strong correlations with the market quality measures, with the exception of Percent

Realized Spreads. Lastly, none of the control variables or variables of interest show any strong correlations that could pose problems with using an OLS approach (i.e. high multicollinearity).

Tables 1-4 through 1-8 show the results of OLS regressions for the market quality variables. Model 1 directly tests for differences in the market quality characteristics across tiers, without considering the vector of control variables. The model specified is:

$$MQ = \beta_0 + \gamma_1 * NCM + \gamma_2 * GSM + \varepsilon$$

With the exception of Model 1 for Percent Realized Spreads, all dummy variables are statistically significant, and all models have statistically significant F-statistics (at the α=.01 level of significance).

Model 2 in Tables 1-4 through 1-8 shows the relationship between the vector of control variables and the five market quality characteristics. The model specified is:

$$MQ = \beta_0 + \beta_1 * PRC + \beta_2 * MMCNT + \beta_3 * SE + \beta_4 * SHROUT + \beta_5 * MktVal + \varepsilon$$

As with Model 1, Percent Realized Spreads fails to show any relationship to the independent variables. None of the control variables are significantly different than zero, and the model has an insignificant F-statistic. However, all four other market quality characteristics show a strong relationship to most of the control variables (with at least three 3, and as many as 4, control variables being statistically significant in each model).

All four have statistically significant F-statistics (at the α=.01 level of significance), and the models explain from 23.23% to 31.15% of the variance in the dependent variable.

Model 3 in Tables 1-4 through 1-8 test for market quality differences across tiers while controlling for the vector of control variables. The model specified is:

$$MQ = \beta_0 + \left[\beta_1 * PRC + \beta_2 * MMCNT + \beta_3 * SE + \beta_4 * SHROUT + \beta_5 * MktVal\right] + \gamma_1 * NCM + \gamma_2 * GSM + \varepsilon$$

This model controls for any market quality differences due to the common listing characteristics used in all three tiers, and thereby artificially subdividing the NASDAQ listing environment. Again, with the exception of Model 3 for Percent Realized Spreads, the regressions show a relationship between the control variables and the market quality characteristics, as well as between the variables of interest and the market quality characteristics. All four regressions are statistically significant F-statistics (at the α=.01 level of significance), and all improve upon the unexplained variance in the market quality characteristics, by as much as 15.3%.

The results of these regressions are consistent with the hypothesis that NASDAQ's tiered structure shows unique market quality differences across tiers. The model controls for the common characteristics of the listing requirements, yet 4 of the 5 market quality characteristics still show significant differences across tiers. As you move from the bottom of the NASDAQ market, effective spreads tighten, price improvement declines, and trading becomes more fragmented across markets. While these results remain consistent with a "scale effect," the results do not disprove the "unique markets hypothesis."

The event study analysis provides a more robust test by looking for immediate, short-term changes in market quality when firms change tiers into new listing enviroments. Tables 1-9 through 1-10 show the daily market quality characteristics for the 41-day window surrounding the listing switch. Table 1-9 shows equally weighted and value weighted daily averages for firms that rose to a higher tier, while 1-10 shows equally weighted and value weighted daily averages for firms that dropped to a lower tier. A quick scan of the measures does not reveal any obvious pattern of change in market quality characteristics, and this lack of a change appears robust using equally and value weighted measures, as well as for firms that moved up onto a new tier, or dropped.

Figures 1-2 through 1-11 graphically display these same results on the average daily market quality measures. Note that no short-term, immediate shift appears to occur for any of the five market quality measures. While the cross-section analysis supports the idea that true market quality differences exist between the tiers, the initial event study analysis does not support the "unique markets hypothesis." In fact, only Figures 1-2 and 1-3 tend to illustrate any sort of trend, with effective spreads appearing to increase in the 20 days after firms dropped to a lower tier.

Table 1-11 shows the results of T-tests comparing market quality measures post-switch versus pre-switch. Percent Effective Spreads appear to increase when stocks both rise and drop onto new tiers. This finding is robust for equal and value weighted for stocks that drop, but not for firms that rise. All other market quality measures fail to show any significant, robust pattern of changes in market quality in the immediate days surrounding a listing switch.

Thus far, the evidence is mixed. Cross-section analysis appears consistent with the idea that true market quality differences may exist. Event study analysis appears to rule out short-term changes in market quality, with the possible exception of effective spreads. While effective spreads appear to change in the immediate time frame after changing tiers, the direction of change is not consistent with the cross-section findings for firms moving onto a higher tier. Regardless, the lack of a clear short-term change consistent with the cross-section findings does not necessarily rule out the possibility of a long-term change. The final hypothesis needing testing refers back to Merton's investor attention hypothesis.

If true market quality differences exist, the differences could stem from at least two possible sources. First, the market quality effect from exposing firms to the application of new listing standards, and revealing more precise information to the marketplace for accurate pricing of their stocks, could result over the long-term (which is not tested here). Second, market quality changes could stem from increased investor attention (i.e. a visibility effect) as stocks become more well-known as they rise to higher levels in the NASDAQ marketplace.

To test this hypothesis, I include two proxies for investor attention, analyst coverage and institutional investing, into the cross-section models. For robustness, I test using two approaches. The first approach uses an OLS regression where the two visibility proxies are included into Model 3 and estimated simultaneously with the control variables and the variables of interest for the upper and lower tiers, resulting in the following specified model:

$$MQ = \beta_0 + \left[\beta_1 * PRC + \beta_2 * MMCNT + \beta_3 * SE + \beta_4 * SHROUT + \beta_5 * MktVal\right] + \beta_6 * INST + \beta_7 * Analysts + \gamma_1 * NCM + \gamma_2 * GSM + \varepsilon$$

For robustness, I also use a two-stage regression approach where the control variables from Model 2 of the cross-section analysis are first used to estimate the expected value of the market quality measure, and then a second stage is used to test for a visibility effect and market quality differences across the tiers. The second approach results in the following models being applied for each market quality measure:

Stage One:

$$E(MQ) = \beta_0 + \beta_1 * PRC + \beta_2 * MMCNT + \beta_3 * SE + \beta_4 * SHROUT + \beta_5 * MktVal + \varepsilon$$

Stage Two:

$$MQ = \beta_0 + \beta_1 * E(MQ) + \beta_2 * INST + \beta_3 * Analysts + \gamma_1 * NCM + \gamma_2 * GSM + \varepsilon$$

The results are shown in Tables 1-12 and 1-13. Table 1-12 shows that all five models for the market quality measures have significant F-statistics (four at the α=.01 level of significance, and one at the α=.05 level). These results are consistent with the findings from the cross-section portion, now including the model for Realized Spreads (though it does explain very little variance in Realized Spreads). All models improve upon the unexplained variance in the dependent variables, by as much as 14% of the unexplained variance from the multivariate model that didn't include the visibility proxies. Institutional interest shows as statistically significant (at the α=.01 level of significance) for all five market quality measures. Analyst coverage shows significance at the α=.01 level of significance for Effective Spreads, but is approaching statistical

significance (at the α=.1 level of significance) for two of the other four market quality measures.

These results reiterate the earlier findings that market quality faces a tradeoff as you move from the lower tiers, where firms are smaller and less visible to investors, to the higher tiers. Effective Spreads decrease, while price improvement declines and trading becomes more fragmented across market centers. The findings are robust in the two-stage methodology. Model 7b shows the results of the two-stage approach. Again, all of the market quality measures show statistically significant F-statistics (at the α=.01 level of significance), and explain similar amounts of variance in the market quality measures. Institutional interest is significant at the α=.01 level of significance for all five market quality measures, and analyst coverage is significant for the market concentration measure (HHI), and is approaching significance for Effective Spreads.

CHAPTER 8

CONCLUSION

This study looks at a possible explanation for NASDAQ's 2006 reorganization from a two-tiered marketplace into three tiers. Using the Chemmanur and Fulghieri (2006) framework, I propose a "unique markets hypothesis" where NASDAQ's motivation was to create a unique marketplace for assets to trade, where listing standards are used to create a more transparent trading environment, thereby resulting in market quality differences across tiers. The results indicate that real market quality differences do appear to result from the listing structure. However, the differences appear to result more from a visibility effect rather than simply from the listing standards being applied.

A short-term analysis of immediate changes in market quality fails to detect any material changes in the 20 trading days immediately after a firm switches tiers (with the exception of a slight increase in effective spreads). The evidence is consistent with the notion that as firms become better known by investors, additional institutional trading and analyst coverage make trading in those assets more transparent, thereby resulting in market quality differences between the NASDAQ tiers. An alternate scenario not ruled out by the evidence in this study is that listing standards may result in market quality differences over longer time frames, but not in the short-term. Just as likely, before stocks change to a new tier, they may already exhibit market quality characteristics for the tier to which they'll move. Future studies may be able to further clarify the nature of this relationship.

Lastly, any market quality effect may be due to the effect of disclosure standards being enforced, with the listing standards simply being the tool through which the disclosures reveal information to the marketplace. This idea lends itself nicely to studies on stocks where NASDAQ discloses firms that fail to meet listing standards for a specific tier, and then testing whether or not those disclosures result in changes to the trading environment for those stocks (or even an asset pricing effect). In these cases, the listings standards are being held constant and the disclosure impact could be isolated. This approach also avoids the joint hypothesis problems from earlier studies on the disclosure-liquidity relationship, since these stocks would all face the same listing requirements, the same regulatory environment, and the same market microstructure.

Table 1-1: Changes in NASDAQ Tier Listings, 2006-2008

Tier	Jul-06	Dec-08	Change
Global Select Market	1,140	1,222	82
Global Market	1,353	1,116	(237)
Capital Market	529	497	(32)
Total	3,022	2,835	(187)

Table 1-2: NASDAQ Listing and Market Quality Statistics.

Panel A: Descriptive Statistics for Firm Characteristics	GSM (n=1,039)			NGM (n=1,192)			NCM (n=436)		
Variable	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max
Bid Price	$2.14	$27.90	$410.61	$0.32	$11.91	$114.79	$0.44	$9.25	$111.43
# Mkt Makers	14.50	39.92	97.50	11.00	28.21	73.50	11.00	20.31	53.50
Stockholder's Equity (in $Ms)	($1,065.15)	$817.52	$40,314.50	($5,790.50)	$86.11	$1,497.08	($244.49)	$29.92	$825.60
# Publicly Available Shares (in Ms)	3.15	107.08	9,941.00	1.12	26.20	486.72	1.20	15.83	241.19
Market Value of Public Shares (in $Ms)	$85.69	$2,679.27	$251,755.83	$3.37	$229.18	$7,992.03	$1.87	$95.69	$6,279.41

Panel B: Regressions for differences between tiers.

The NASDAQ Global Market is the base case. *NCM* is a dummy variable equal to 1 if the stock is listed on the NASDAQ Capital Market, and 0 otherwise. *GSM* is a dummy variable equal to 1 if the stock is listed on the Global Select Market, and 0 otherwise.

Dependent Variable	α	NCM	GSM	F	adj-r^2
Bid Price	$11.94	-$2.94	$15.83	422.94	22.01%
	0.0006***	<.0001***	<.0001***	<.0001***	
# Mkt Makers	28.28	-8.23	11.79	518.25	25.70%
	<.0001***	<.0001***	<.0001***	<.0001***	
Stockholder's Equity (in $Ms)	$86.08	-$56.26	$731.43	65.22	4.59%
	0.0715*	0.5412	<.0001***	<.0001***	
# Publicly Available Shares (in Ms)	$26.43	-$11.27	$77.90	29.35	1.86%
	0.0006***	0.4406	<.0001***	<.0001***	
Market Value of Public Shares (in $Ms)	$231.92	-$144.25	$2,387.26	45.33	2.88%
	0.2106	0.6807	<.0001***	<.0001***	

***, **, * denote statistical significance at the .01, .05, and .1 level of significance.

Panel C: Descriptive Statistics for Market Quality Characteristics	GSM (n=1,039)			NGM (n=1,192)			NCM (n=436)		
Variable	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max
% Effective Spread	0.009%	0.106%	1.281%	0.023%	0.469%	3.068%	0.016%	1.140%	9.050%
% Realized Spread	-0.104%	0.030%	0.941%	-5.526%	0.151%	26.912%	-104.562%	-0.139%	4.911%
Price Improvement Amount	0.010%	0.080%	0.679%	0.026%	0.250%	2.313%	0.013%	0.527%	3.706%
Price Improvement Rate	0.852%	5.866%	16.594%	0.456%	5.440%	23.805%	0.902%	6.411%	24.049%
Herfindahl-Hirschman Index (HHI)	0.5002	0.5831	0.8955	0.5000	0.6675	1.0000	0.5042	0.7739	0.9903

Table 1-3: Correlations.

	PRC	MMCNT	SE	SHROUT	MktVal	NCM	GSM	%EffSprd	%RealSprd	PI Amt	PI Rate	HHI	INST
PRC	1												
MMCNT	0.17414*** <.0001	1											
SE	0.22329*** <.0001	0.37709*** <.0001	1										
SHROUT	0.03214* 0.097	0.36221*** <.0001	0.78685*** <.0001	1									
MktVal	0.23333*** <.0001	0.34874*** <.0001	0.85685*** <.0001	0.90585*** <.0001	1								
NCM	-0.21218*** <.0001	-0.33837*** <.0001	-0.08686*** <.0001	-0.05908*** 0.0023	-0.06517*** 0.0008	1							
GSM	0.46252*** <.0001	0.46201*** <.0001	0.21546*** <.0001	0.13569*** <.0001	0.1676*** <.0001	-0.35316*** <.0001	1						
%EffSprd	-0.27266*** <.0001	-0.48971*** <.0001	-0.12172*** <.0001	-0.08823*** <.0001	-0.09657*** <.0001	0.49458*** <.0001	-0.42119*** <.0001	1					
%RealSprd	-0.00176*** 0.9274	-0.01213 0.5313	-0.00324 0.8671	-0.00208 0.9146	-0.00274 0.8876	-0.03491* 0.0715	-0.00856 0.6586	0.05364*** 0.0056	1				
PI Amt	-0.363*** <.0001	-0.39249*** <.0001	-0.11891*** <.0001	-0.07701*** <.0001	-0.09529*** <.0001	0.44654*** <.0001	-0.4028*** <.0001	0.74602*** <.0001	0.02359 0.2233	1			
PI Rate	0.3517*** <.0001	-0.26369*** <.0001	-0.06113*** 0.0016	-0.11875*** <.0001	-0.03514* 0.0696	0.10812*** <.0001	0.03069 0.113	0.10379*** <.0001	0.02049 0.2901	-0.03621* 0.0615	1		
HHI	-0.34956*** <.0001	-0.47479*** <.0001	-0.14226*** <.0001	-0.06427*** 0.0009	-0.1055*** <.0001	0.47868*** <.0001	-0.48926*** <.0001	0.56043*** <.0001	0.00107 0.9558	0.48385*** <.0001	0.13247*** <.0001	1	
INST	-0.43121*** <.0001	0.02208 0.2607	0.03061 0.1188	0.16432*** <.0001	0.06096*** 0.0019	0.25027*** <.0001	-0.33811*** <.0001	0.27313*** <.0001	0.02164 0.2702	0.34391*** <.0001	-0.32396*** <.0001	0.42113*** <.0001	1
Analysts	0.22903*** <.0001	0.71269*** <.0001	0.40849*** <.0001	0.31819*** <.0001	0.38034*** <.0001	-0.16062*** <.0001	0.34291*** <.0001	-0.34617*** <.0001	-0.03176 0.1865	0.30651*** <.0001	-0.12227*** <.0001	-0.33908*** <.0001	-0.05258** 0.0221

***, **, * denote statistical significance at the .01, .05, and .1 level of significance.

Table 1-4: OLS Estimations, Effective Spread.

Dependent variable: *Percent Effective Spread* is the realized spread, measured as a percent of the stock price.
Independent variables: *PRC* is the stock price. *MMCNT* is the number of registered market makers. *SE* is the Stockholders' Equity. *SHROUT* is the number of publicly held shares of stock (i.e. Public Float). *Mktval* is the market value of publicly held shares. *NCM* is a dummy variable equaling 1 if the stock is listed on the NASDAQ Capital Market, and 0 otherwise. *GSM* is a dummy variable equaling 1 if the stock is listed on the Global Select Market, and 0 otherwise. The NASDAQ Global Market serves as the base case.

Independent Variables	Model		
	1	2	3
α	4.640E-01	1.239E+00	9.341E-01
	<.0001***	<.0001***	<.0001***
PRC		-8.540E-03	-4.480E-03
		<.0001***	<.0001***
MMCNT		-2.108E-02	-1.462E-02
		<.0001***	<.0001***
SE		8.700E-06	1.271E-05
		0.4666	0.2509
SHROUT		-2.476E-07	-1.127E-07
		0.0066***	0.1836
Mktval		1.889E-08	9.587E-09
		<.0001***	0.0193**
NCM	7.104E-01		5.448E-01
	<.0001***		<.0001***
GSM	-3.555E-01		-1.437E-01
	<.0001***		<.0001***
n	2667	2667	2667
F	609.81	219.22	249.1
p-value	<.0001***	<.0001***	<.0001***
Adj-r^2	0.3135	0.2917	0.3945

***, **, * denote statistical significance at the .01, .05, and .1 level of significance.
P-values reported below regression coefficients.

Table 1-5: OLS Estimations, Percent Realized Spread.

Dependent variable: *Percent Realized Spread* is the realized spread, measured as a percent of the stock price.
Independent variables: *PRC* is the stock price. *MMCNT* is the number of registered market makers. *SE* is the Stockholders' Equity. *SHROUT* is the number of publicly held shares of stock (i.e. Public Float). *Mktval* is the market value of publicly held shares. *NCM* is a dummy variable equaling 1 if the stock is listed on the NASDAQ Capital Market, and 0 otherwise. *GSM* is a dummy variable equaling 1 if the stock is listed on the Global Select Market, and 0 otherwise. The NASDAQ Global Market serves as the base case.

Independent Variables	Model		
	1	2	3
α	0.12642	1.227E-01	2.635E-01
	.0828*	0.323	.0668*
PRC		2.041E-04	-1.552E-04
		0.9484	0.965
MMCNT		-2.240E-03	-3.960E-03
		0.535	0.3303
SE		1.726E-07	2.720E-06
		0.9975	0.9612
SHROUT		5.845E-08	4.679E-08
		0.8906	0.913
Mktval		-1.708E-09	-5.720E-10
		0.9334	0.978
NCM	-2.895E-01		-3.207E-01
	0.0363*		0.0244**
GSM	-1.209E-01		-7.643E-02
	0.2489		0.5465
n	2667	2667	2667
F	2.29	0.08	0.79
p-value	0.1014	0.9948	0.5952
Adj-r^2	0.001	-0.0017	-0.0006

***, **, * denote statistical significance at the .01, .05, and .1 level of significance.
P-values reported below regression coefficients.

Table 1-6: OLS Estimations, Price Improvement Amount.

Dependent variable: *Price Improvement Amount* is the dollar amount of price improvement for trades executed within the quoted spread, measured as a percent of the stock price.
Independent variables: *PRC* is the stock price. *MMCNT* is the number of registered market makers. *SE* is the Stockholders' Equity. *SHROUT* is the number of publicly held shares of stock (i.e. Public Float). *Mktval* is the market value of publicly held shares. *NCM* is a dummy variable equaling 1 if the stock is listed on the NASDAQ Capital Market, and 0 otherwise. *GSM* is a dummy variable equaling 1 if the stock is listed on the Global Select Market, and 0 otherwise. The NASDAQ Global Market serves as the base case.

Independent Variables	Model		
	1	2	3
α	2.500E-03	5.640E-03	4.370E-03
	<.0001***	<.0001***	<.0001***
PRC		-0.0000616	-0.00004547
		<.0001***	<.0001***
MMCNT		-7.259E-05	-4.646E-05
		<.0001***	<.0001***
SE		1.192E-08	2.651E-08
		0.8353	0.6251
SHROUT		-2.190E-09	-1.655E-09
		<.0001***	<.0001***
Mktval		1.273E-10	9.026E-11
		<.0001***	<.0001***
NCM	2.780E-03		2.280E-03
	<.0001***		<.0001***
GSM	-1.700E-03		-5.301E-04
	<.0001***		<.0001***
n	2667	2667	2667
F	485.75	187.97	197.26
p-value	<.0001***	<.0001***	<.0001***
Adj-r^2	0.2675	0.2596	0.3401

***, **, * denote statistical significance at the .01, .05, and .1 level of significance.
P-values reported below regression coefficients.

Table 1-7: OLS Estimations, Price Improvement Rate.

Dependent variable: *Price Improvement Rate* is the percent of shares executed within the quoted spread, measured as a percent of total volume.
Independent variables: *PRC* is the stock price. *MMCNT* is the number of registered market makers. *SE* is the Stockholders' Equity. *SHROUT* is the number of publicly held shares of stock (i.e. Public Float). *Mktval* is the market value of publicly held shares. *NCM* is a dummy variable equaling 1 if the stock is listed on the NASDAQ Capital Market, and 0 otherwise. *GSM* is a dummy variable equaling 1 if the stock is listed on the Global Select Market, and 0 otherwise. The NASDAQ Global Market serves as the base case.

Independent Variables	Model		
	1	2	3
α	5.440E-02	6.532E-02	6.194E-02
	<.0001***	<.0001***	<.0001***
PRC		6.272E-04	6.474E-04
		<.0001***	<.0001***
MMCNT		-5.908E-04	-5.402E-04
		<.0001***	<.0001***
SE		-9.103E-07	-9.377E-07
		0.0817*	0.0722*
SHROUT		1.825E-09	2.490E-09
		0.6467	0.5329
Mktval		4.447E-11	-6.757E-12
		0.8162	0.9721
NCM	9.720E-03		7.140E-03
	<.0001***		<.0001***
GSM	4.270E-03		7.389E-04
	<.0001***		0.5318
n	2667	2667	2667
F	23.19	162.32	121.27
p-value	<.0001***	<.0001***	<.0001***
Adj-r^2	0.0164	0.2323	0.2400

***, **, * denote statistical significance at the .01, .05, and .1 level of significance.
P-values reported below regression coefficients.

Table 1-8: OLS Estimations, Herfindahl-Hirschman Index.

Dependent variable: *Herfindahl-Hirschman Index* is the measure representing order flow fragmentation across major market centers, and ranges from 0 to 1.
Independent variables: *PRC* is the stock price. *MMCNT* is the number of registered market makers. *SE* is the Stockholders' Equity. *SHROUT* is the number of publicly held shares of stock (i.e. Public Float). *Mktval* is the market value of publicly held shares. *NCM* is a dummy variable equaling 1 if the stock is listed on the NASDAQ Capital Market, and 0 otherwise. *GSM* is a dummy variable equaling 1 if the stock is listed on the Global Select Market, and 0 otherwise. The NASDAQ Global Market serves as the base case.

Independent Variables	Model		
	1	2	3
α	0.66754	7.964E-01	7.425E-01
	<.0001***	<.0001***	<.0001***
PRC		-1.900E-03	-9.789E-04
		<.0001***	<.0001***
MMCNT		-3.580E-03	-2.270E-03
		<.0001***	<.0001***
SE		-2.150E-06	-8.398E-07
		0.3087	0.6659
SHROUT		-3.875E-10	3.023E-08
		0.9807	0.0424**
Mktval		2.402E-09	3.369E-10
		0.0019***	0.6399
NCM	1.064E-01		8.612E-02
	<.0001***		<.0001***
GSM	8.443E-02		-4.482E-02
	<.0001***		<.0001***
n	2667	2667	2667
F	705.56	242.25	273.1
p-value	<.0001***	<.0001***	<.0001***
Adj-r^2	0.3458	0.3115	0.4167

***, **, * denote statistical significance at the .01, .05, and .1 level of significance.
P-values reported below regression coefficients.

Table 1-9: Market Quality as Firms Rise to Higher Tier.

Equally Weighted					
Trading Day	EffSpread	RealSpread	PI Amt	PI Rate	HHI
-20	1.01%	1.17%	0.41%	35.01%	49.69%
-10	0.81%	0.97%	0.27%	25.31%	46.82%
-9	1.00%	1.12%	0.30%	32.37%	48.42%
-8	0.84%	1.01%	0.24%	32.77%	47.46%
-7	0.86%	1.01%	0.27%	31.57%	44.72%
-6	0.80%	0.98%	0.28%	30.54%	50.71%
-5	0.90%	1.10%	0.50%	31.83%	45.84%
-4	1.14%	1.72%	0.30%	30.37%	46.76%
-3	0.95%	0.99%	0.22%	34.90%	48.18%
-2	0.69%	0.80%	0.22%	32.49%	43.70%
-1	0.96%	1.14%	0.26%	31.72%	46.26%
0	0.81%	0.99%	0.27%	33.42%	46.08%
1	0.87%	1.03%	0.28%	33.63%	46.33%
2	1.08%	1.28%	0.27%	30.28%	46.70%
3	0.90%	0.91%	0.25%	32.14%	47.25%
4	1.20%	1.05%	0.33%	28.52%	46.10%
5	1.05%	0.81%	0.35%	33.10%	45.92%
6	0.99%	1.09%	0.41%	34.15%	47.26%
7	1.10%	0.95%	0.25%	33.24%	48.40%
8	0.85%	1.02%	0.24%	30.65%	46.75%
9	1.04%	0.81%	0.26%	30.85%	47.68%
10	0.92%	1.07%	0.23%	31.35%	47.34%
20	1.03%	1.00%	0.23%	29.74%	45.67%
Value Weighted					
Trading Day	EffSpread	RealSpread	PI Amt	PI Rate	HHI
-20	0.36%	0.75%	0.12%	20.35%	44.93%
-10	0.47%	0.78%	0.11%	20.58%	46.00%
-9	0.40%	0.73%	0.14%	25.19%	42.79%
-8	0.36%	0.65%	0.11%	23.80%	40.03%
-7	0.49%	0.66%	0.12%	21.47%	40.71%
-6	0.42%	0.66%	0.12%	22.34%	42.58%
-5	0.40%	0.70%	0.12%	20.40%	41.45%
-4	0.35%	0.99%	0.10%	20.13%	40.96%
-3	0.61%	0.75%	0.11%	19.96%	41.70%
-2	0.37%	0.68%	0.12%	23.83%	40.31%
-1	0.38%	0.68%	0.12%	20.32%	41.78%
0	0.42%	0.95%	0.13%	22.02%	44.01%
1	0.46%	0.68%	0.12%	22.83%	40.74%
2	0.45%	0.80%	0.13%	21.42%	42.87%
3	0.37%	0.66%	0.11%	20.84%	44.03%
4	0.46%	0.88%	0.14%	23.14%	41.30%
5	0.41%	0.63%	0.14%	23.94%	41.35%
6	0.48%	0.82%	0.13%	20.40%	40.21%
7	0.48%	0.66%	0.13%	21.80%	52.66%
8	0.35%	0.66%	0.12%	23.15%	40.61%
9	0.41%	0.57%	0.14%	24.13%	42.11%
10	0.44%	0.64%	0.11%	24.85%	42.18%
20	0.53%	1.15%	0.16%	18.68%	38.74%

Table 1-10: Market Quality as Firms Drop to Lower Tier.

Equally Weighted					
Trading Day	EffSpread	RealSpread	PI Amt	PI Rate	HHI
-20	3.55%	3.81%	1.16%	33.04%	48.97%
-10	3.99%	4.34%	1.03%	34.00%	51.06%
-9	4.33%	4.37%	1.28%	32.15%	52.88%
-8	4.08%	4.16%	2.74%	30.40%	52.60%
-7	4.27%	3.82%	1.34%	26.02%	53.18%
-6	4.15%	4.06%	1.37%	31.62%	51.12%
-5	4.00%	4.19%	1.12%	27.75%	50.06%
-4	5.02%	4.34%	1.43%	31.57%	52.14%
-3	4.69%	4.23%	1.38%	35.23%	53.56%
-2	4.14%	3.81%	1.14%	29.95%	50.35%
-1	4.17%	4.30%	1.31%	25.97%	50.72%
0	5.02%	4.64%	1.34%	32.40%	52.71%
1	4.51%	4.14%	1.62%	34.04%	51.16%
2	4.01%	3.88%	1.01%	30.99%	53.60%
3	4.33%	3.86%	1.26%	28.55%	50.22%
4	4.57%	3.66%	1.18%	38.66%	53.80%
5	4.56%	4.36%	1.84%	32.90%	53.08%
6	3.89%	3.68%	1.34%	32.58%	49.20%
7	5.73%	5.74%	1.41%	31.51%	49.13%
8	4.28%	4.41%	2.12%	36.30%	52.12%
9	4.51%	3.88%	1.20%	33.77%	51.80%
10	4.70%	4.72%	1.62%	32.73%	52.65%
20	4.81%	4.40%	1.47%	36.95%	54.39%
Value Weighted					
Trading Day	EffSpread	RealSpread	PI Amt	PI Rate	HHI
-20	1.99%	2.31%	0.50%	22.44%	42.27%
-10	2.55%	2.90%	0.68%	26.23%	46.12%
-9	2.32%	2.62%	0.53%	25.04%	47.14%
-8	2.26%	2.43%	0.72%	25.53%	45.69%
-7	2.17%	2.51%	0.63%	19.76%	43.29%
-6	2.09%	2.45%	0.62%	19.23%	43.34%
-5	2.09%	2.75%	0.56%	16.56%	44.46%
-4	2.38%	2.82%	0.67%	26.42%	52.04%
-3	2.59%	2.66%	0.78%	24.24%	49.68%
-2	2.17%	2.63%	0.91%	13.98%	55.61%
-1	3.80%	2.81%	1.11%	22.01%	45.45%
0	3.50%	3.50%	1.06%	25.82%	45.50%
1	2.82%	2.98%	0.85%	24.74%	45.67%
2	3.20%	2.80%	0.87%	23.54%	48.84%
3	3.33%	3.22%	0.77%	22.43%	46.29%
4	2.20%	2.84%	0.66%	31.94%	52.36%
5	3.08%	2.99%	0.80%	23.36%	46.56%
6	2.35%	3.48%	0.70%	24.07%	45.33%
7	2.27%	3.62%	0.57%	18.39%	43.71%
8	2.82%	2.92%	0.79%	20.42%	44.35%
9	2.54%	2.79%	0.77%	23.45%	45.89%
10	2.43%	3.21%	0.67%	22.78%	43.97%
20	2.46%	1.90%	0.39%	27.25%	42.30%

Table 1-11: T-tests for Market Quality Differences.

Pre-Post Market Quality Differences					
		Dropping to Lower Tier		Rising to Higher Tier	
		EW	VW	EW	VW
EffSpread	Post	4.57%	3.05%	0.96%	0.49%
	Pre	4.22%	2.57%	0.96%	0.41%
	Diff (Post-Pre)	0.35%	0.48%	0.00%	0.08%
	p-value	0.0187**	0.0625*	0.9819	0.0377**
RealSpread	Post	4.34%	3.37%	1.00%	0.73%
	Pre	4.10%	2.88%	1.08%	0.71%
	Diff (Post-Pre)	0.24%	0.49%	-0.08%	0.02%
	p-value	0.1356	0.0522*	0.1560	0.6045
PI Rate	Post	32.86%	23.21%	31.44%	22.02%
	Pre	32.06%	22.87%	31.63%	21.11%
	Diff (Post-Pre)	0.80%	0.34%	-0.20%	0.91%
	p-value	0.3723	0.7609	0.7926	0.1518
PI Amt	Post	1.42%	0.72%	0.28%	0.13%
	Pre	1.35%	0.75%	0.29%	0.12%
	Diff (Post-Pre)	0.08%	-0.03%	-0.01%	0.01%
	p-value	0.4306	0.5513	0.5746	0.0027**
HHI	Post	51.80%	45.12%	46.72%	42.99%
	Pre	51.93%	46.62%	46.84%	42.15%
	Diff (Post-Pre)	-0.13%	-1.50%	-0.13%	0.84%
	p-value	0.8143	0.1212	0.7622	0.3787
		n=74		n=84	
***, **, * denote statistical significance at the .01, .05, and .1 level of significance.					

Table 1-12: OLS Estimations for Visibility Effect.

Independent variables: *PRC* is the stock price. *MMCNT* is the number of registered market makers. *SE* is the Stockholders' Equity. *SHROUT* is the number of publicly held shares of stock (i.e. Public Float). *Mktval* is the market value of publicly held shares. *INST* is the percent of total volume from institutional investors. *Analysts* is the number of analysts providing earnings estimates for the stock. *NCM* is a dummy variable equaling 1 if the stock is listed on the NASDAQ Capital Market, and 0 otherwise. *GSM* is a dummy variable equaling 1 if the stock is listed on the Global Select Market, and 0 otherwise. The NASDAQ Global Market serves as the base case.

Independent Variables	Eff Spread	Real Spread	PI Amt	PI Rate	HHI
α	5.117E-01	9.575E-02	2.630E-03	6.613E-02	6.587E-01
	<.0001***	0.1037	<.0001***	<.0001***	0.0018***
PRC	-2.470E-03	-6.201E-04	-2.085E-05	5.320E-04	-3.986E-04
	<.0001***	0.625	<.0001***	<.0001***	0.0018***
MMCNT	-9.910E-03	-3.230E-03	-3.828E-05	-4.559E-04	-1.970E-03
	<.0001***	0.0644*	<.0001***	<.0001***	<.0001***
SE	4.420E-06	9.977E-07	1.111E-08	-9.530E-07	-7.081E-07
	0.3851	0.9489	0.6985	0.0406**	0.6505
SHROUT	-1.698E-07	-1.060E-07	-1.527E-09	4.508E-09	-1.573E-08
	0.0001***	0.431	<.0001***	0.2625	0.2445
Mktval	7.217E-09	3.652E-09	5.891E-11	2.959E-11	1.117E-09
	0.0003***	0.5438	<.0001***	0.8693	0.0646*
INST	1.162E+00	8.950E-01	7.970E-03	-5.319E-02	5.185E-01
	<.0001***	0.0013***	<.0001***	<.0001***	<.0001***
Analysts	3.460E-03	1.140E-03	1.014E-05	-1.103E-04	-4.502E-04
	0.0019***	0.7379	0.1052	0.2769	0.1865
NCM	2.884E-01	-1.508E-01	1.070E-03	9.830E-03	6.108E-02
	<.0001***	0.0321**	<.0001***	<.0001***	<.0001***
GSM	-4.826E-02	1.707E-02	-2.784E-04	2.454E-04	-1.326E-02
	0.0002***	0.6708	0.0002***	0.8381	0.001***
n	2667	2667	2667	2667	2667
F	162.34	1.98	145.23	81.86	146.15
p-value	<.0001***	0.0379**	<.0001***	<.0001***	<.0001***
Adj-r^2	0.4578	0.0051	0.4301	0.2973	0.4317

***, **, * denote statistical significance at the .01, .05, and .1 level of significance.
P-values reported below regression coefficients.

Table 1-13: Two-Stage OLS Estimations for Visibility Effect.

Independent variables: *E(EffSpread)* is the expected effective spread, calculated using the coefficients from the vector of control variables, as the first stage in a two-stage estimation. *INST* is the percent of total volume from institutional investors. *Analysts* is the number of analysts providing earnings estimates for the stock. *NCM* is a dummy variable equaling 1 if the stock is listed on the NASDAQ Capital Market, and 0 otherwise. *GSM* is a dummy variable equaling 1 if the stock is listed on the Global Select Market, and 0 otherwise. The NASDAQ Global Market serves as the base case.

	Dependent Variables									
Independent Variables	Eff Spread		Real Spread		PI Amt		PI Rate		HHI	
α	9.322E-01	5.150E-01	2.510E-01	0.07579	4.420E-03	2.570E-03	6.348E-02	6.680E-02	7.425E-01	6.552E-01
	<.0001***	<.0001***	.0471**	0.1423	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***
E(RealSpread)	6.641E-01	4.139E-01	1.682E+00	1.176E+00	6.858E-01	4.036E-01	9.856E-01	8.184E-01	6.084E-01	4.030E-01
	<.0001***	<.0001***	0.3359	0.1189	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***
INST		1.450E-03		8.129E-01		6.610E-03		-5.081E-02		4.420E-01
		<.0001***		0.0012***		<.0001***		<.0001***		<.0001***
Analysts		9.366E-01		1.259E-04		-3.800E-06		-5.168E-05		-1.060E-03
		0.1448		0.9679		0.473		0.4887		0.0005***
NCM	5.461E-01	3.013E-01	-3.178E-01	-1.440E-01	2.270E-03	1.160E-03	6.730E-03	9.650E-03	8.619E-02	6.618E-02
	<.0001***	<.0001***	0.0246**	0.0397**	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***
GSM	-1.299E-01	-4.597E-02	-8.338E-02	6.694E-04	-5.345E-04	-3.011E-04	1.600E-03	6.531E-04	-4.303E-02	-1.222E-02
	<.0001***	0.0003***	0.456	0.9854	<.0001***	0.1415	0.1031	0.5539	<.0001***	0.0018***
n	2667	2667	2667	2667	2667	2667	2667	2667	2667	2667
F	579.76	280.5	1.84	3.17	459.96	248.58	282.54	147.06	635.21	253.42
p-value	<.0001***	<.0001***	0.1384	0.0075***	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***	<.0001***
Adj-r^2	0.3944	0.4483	0.0009	0.0063	0.3406	0.4185	0.2414	0.2981	0.4165	0.4231

***, **, * denote statistical significance at the .01, .05, and .1 level of significance.
P-values reported below regression coefficients.

Figure 1-1: Optimal Listing Standards.

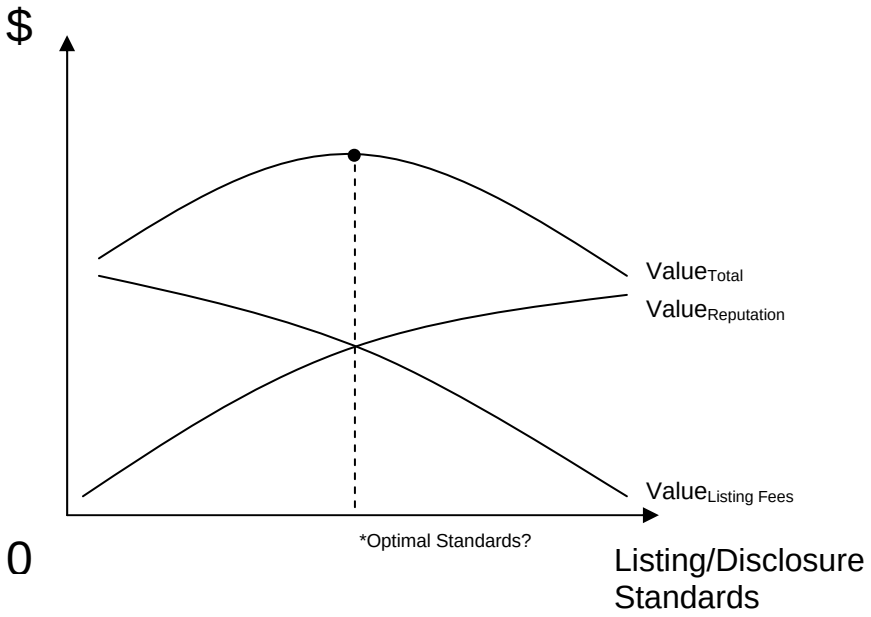


Figure 1-2: Percent Effective Spread (Equally Weighted).

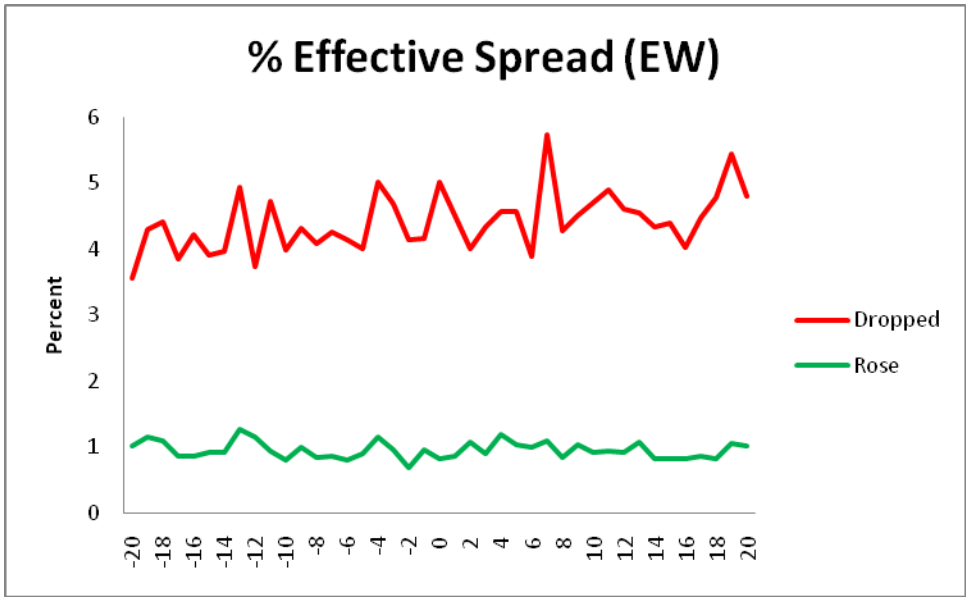


Figure 1-3: Percent Effective Spread (Value Weighted).

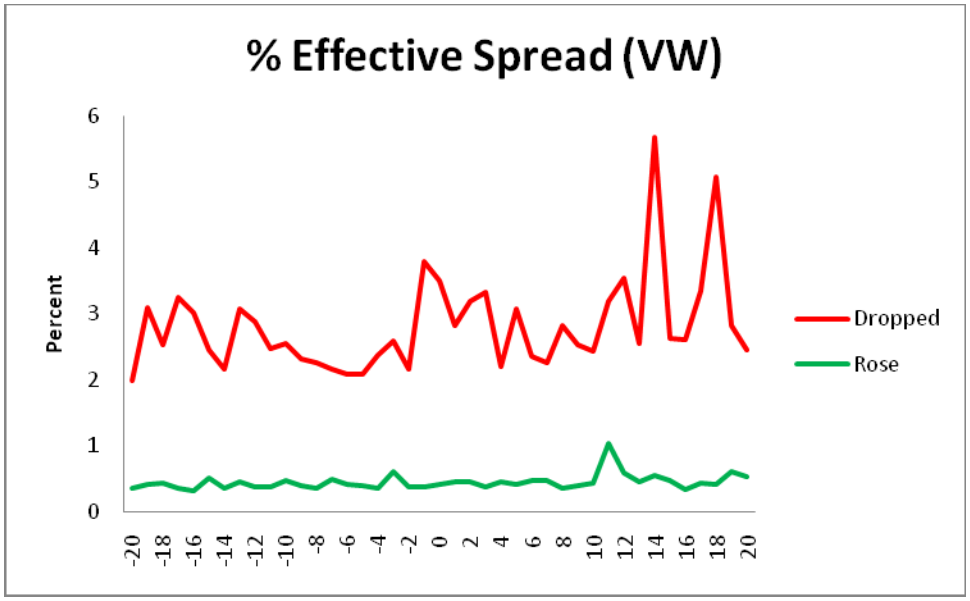


Figure 1-4: Percent Realized Spread (Equally Weighted).

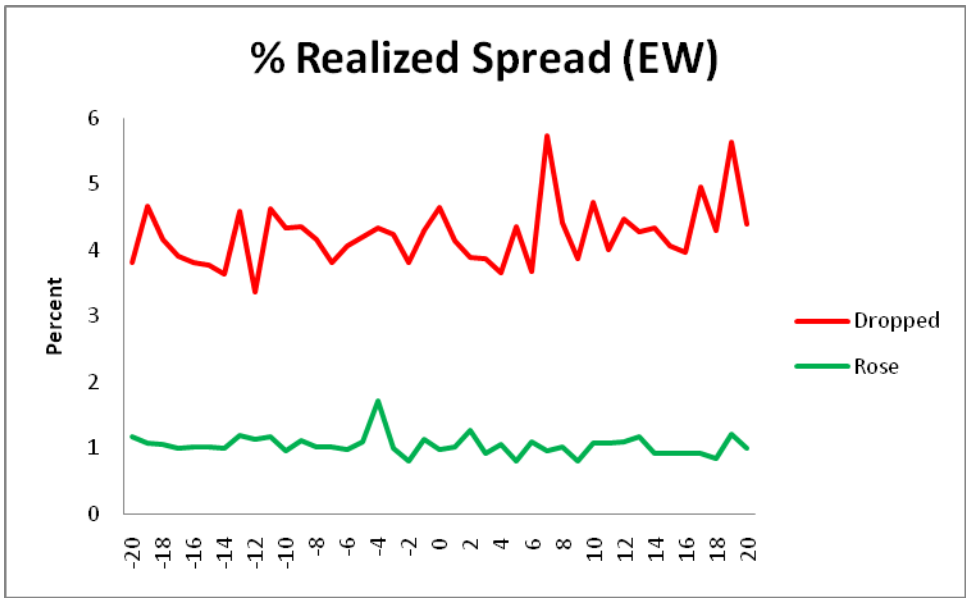


Figure 1-5: Percent Realized Spread (Value Weighted).

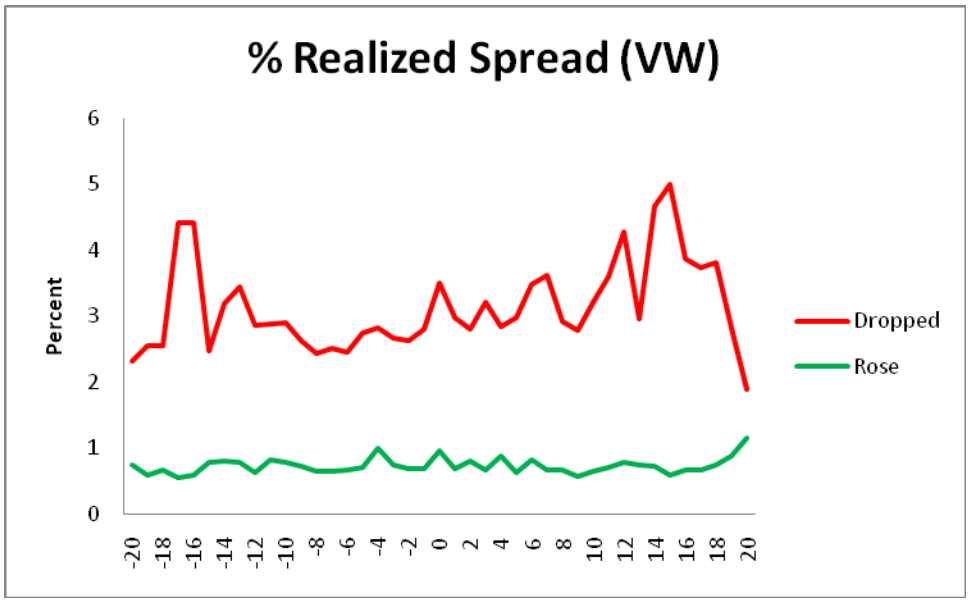


Figure 1-6: Percent Price Improvement Amount (Equally Weighted).

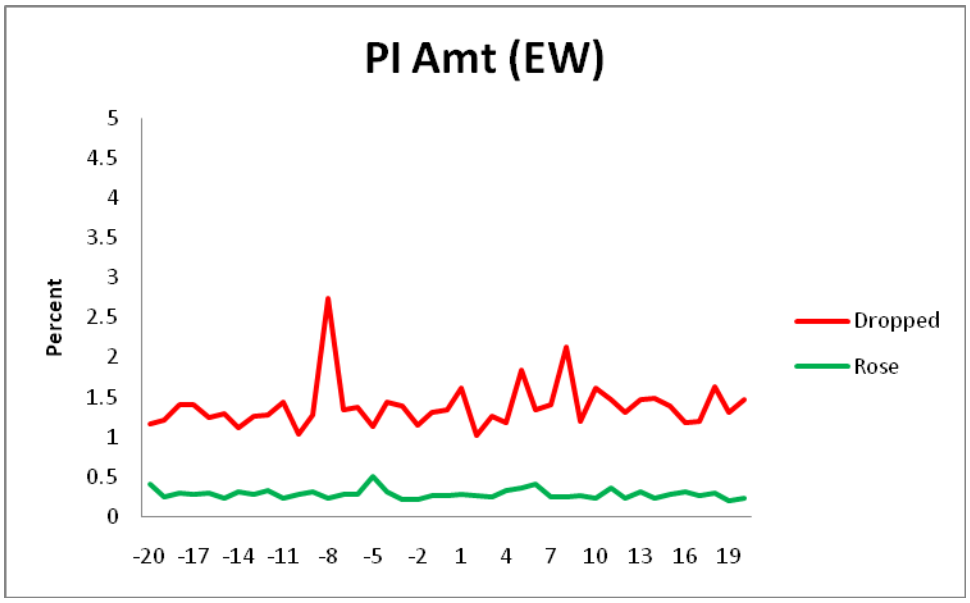


Figure 1-7: Percent Price Improvement Amount (Value Weighted).

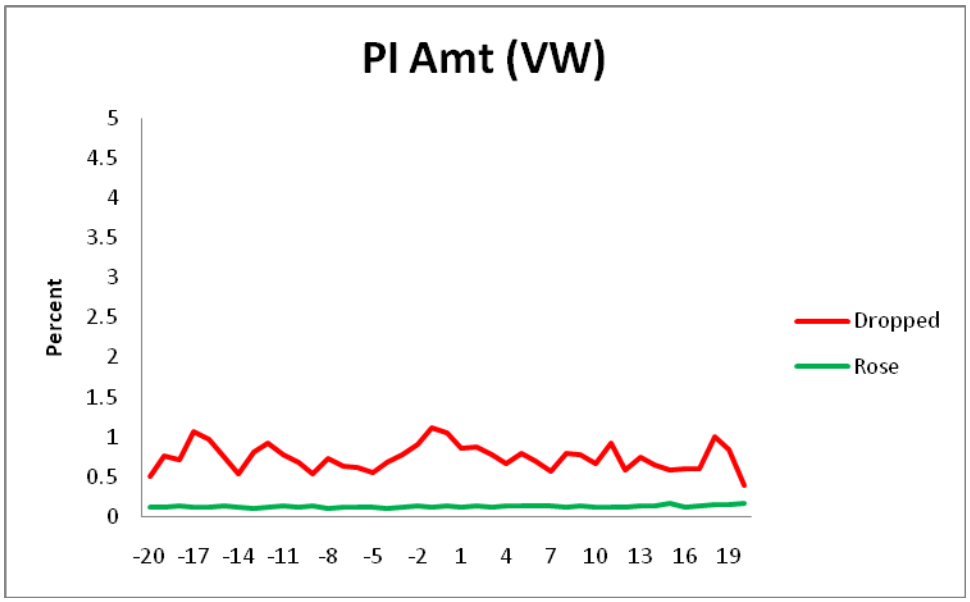


Figure 1-8: Price Improvement Rate (Equally Weighted).

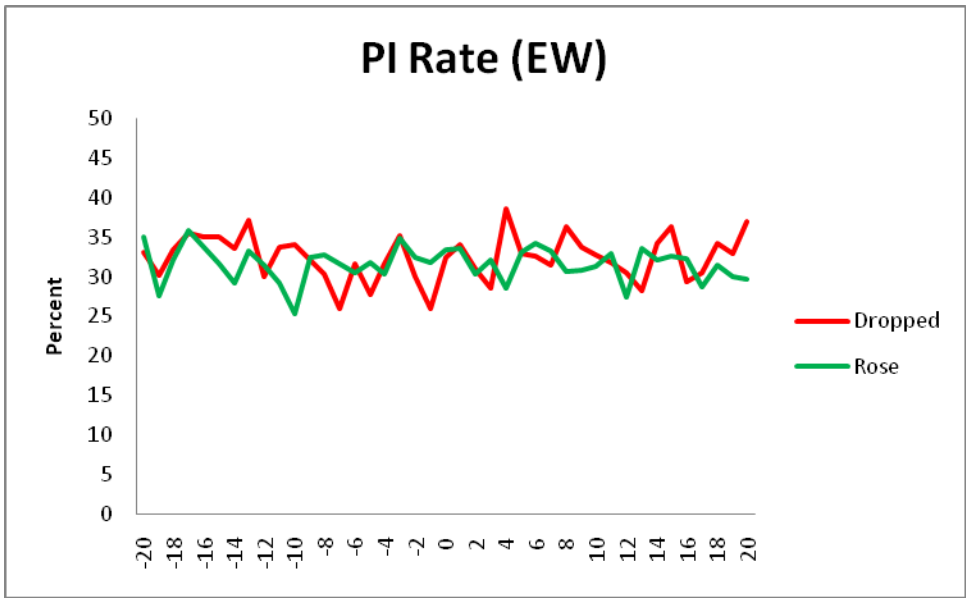


Figure 1-9: Price Improvement Rate (Value Weighted).

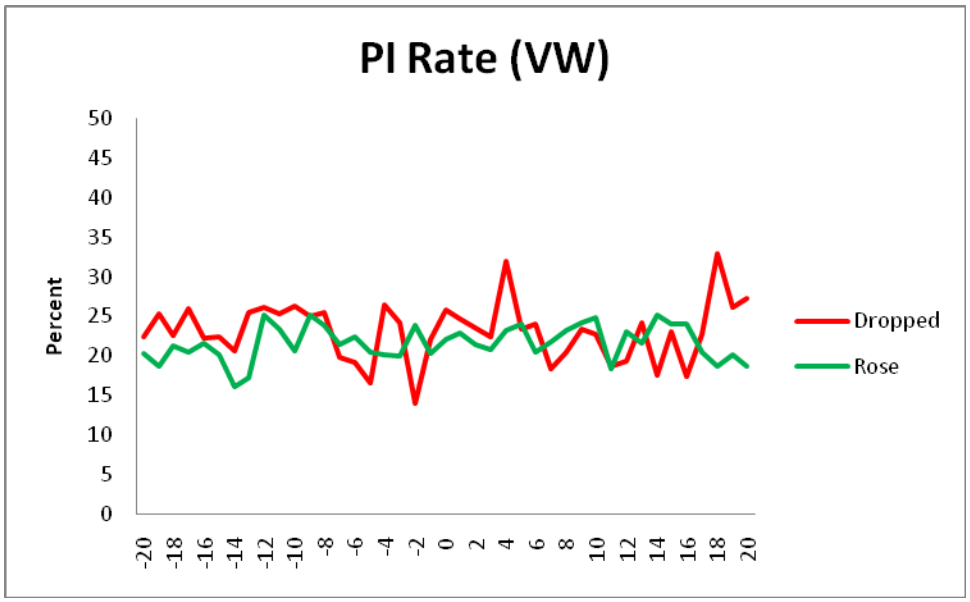


Figure 1-10: Herfindahl-Hirshman Index (Equally Weighted).

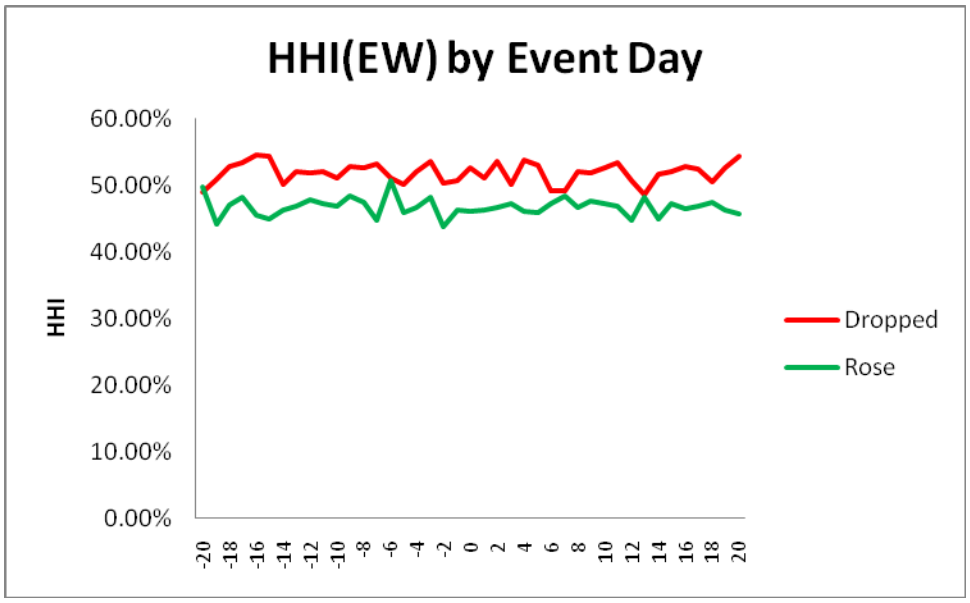
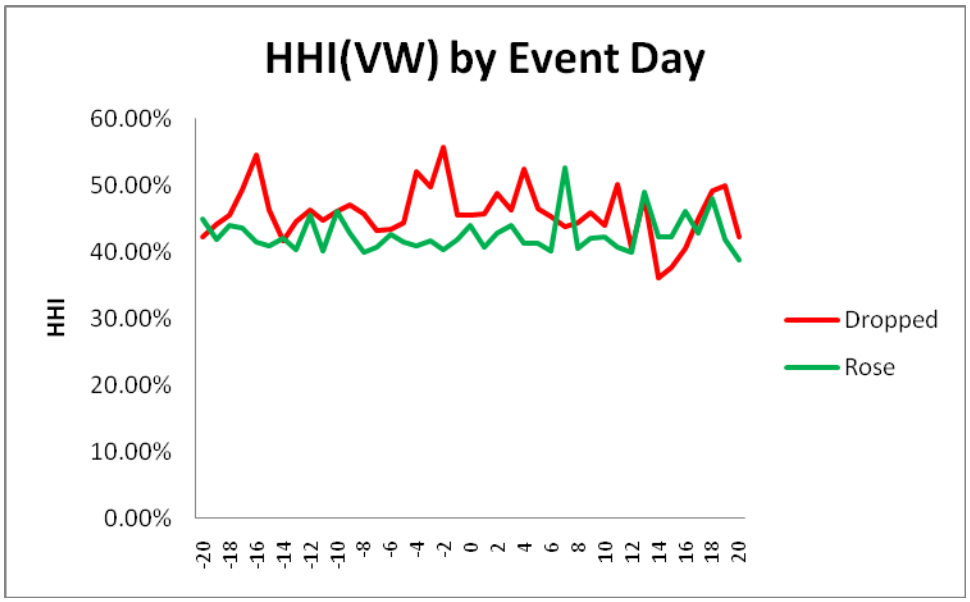


Figure 1-11: Herfindahl-Hirshman Index (Value Weighted).



ESSAY TWO

DO TIERED STRUCTURES FACILITATE A REPUTATION EFFECT? EVIDENCE FROM NASDAQ.

CHAPTER 1

INTRODUCTION

Essay One put forth the notion that NASDAQ's tiered structure may have been motivated by NASDAQ's desire to create unique trading environments, where the tiers use listing requirements (initial or continued) to aid investors in the production of information useful in pricing assets traded in their marketplace. Essay Two presents an alternative motivation. Rather than using a tiered structure to create unique trading environments, NASDAQ may use a tiered structure as a tool to enhance their reputation in order to better compete for listings. This study seeks to determine if NASDAQ's 2006 restructuring resulted in any material changes in NASDAQ's reputation and their competitiveness in the marketplace for listings.

Merton's (1987) investor attention hypothesis states that when a firm increases its investor base (i.e. visibility), it can lower their expected returns, reduce their cost of capital, and increase their market value. Thus, increased visibility can serve as a proxy for higher reputation. The NASDAQ restructuring provides an interesting opportunity to examine the impact of this restructuring on firm reputation via event study.

The first part of the essay uses an asset pricing approach to identify a potential reputation effect. In other words, did investors interpret the restructuring as positively impacting NASDAQ's ability to attract firms or investors, thereby creating the expectation of higher potential earnings through greater listing fees and trading commissions?

While a positive impact to NASDAQ's stock price would clearly represent a *direct* reputation effect, the possibility also exists for an *indirect* reputation effect. If the restructuring signaled lower risk and greater prestige for firms listing on the new GSM tier, the new tier would assist in increasing their investor bases (i.e. visibility), reducing their cost of capital, and increasing their market value. Any collective impact on GSM stocks would represent an *indirect* reputation effect for NASDAQ. The initial analysis focuses on any indirect impact to the stocks affected by the restructuring, the former NASDAQ National Market stocks that were re-categorized as the Global Select and Global Market stocks.

The second part of essay two specifically focuses on any changes in NASDAQ's ability to compete for new listings in the IPO market. A direct change in NASDAQ's competitiveness could also represent a reputation effect resulting from the restructuring. If a higher proportion of new firms that are eligible for listing on multiple exchanges chose to list on NASDAQ after the restructuring, this increase provides support for a reputation effect.

CHAPTER 2

THEORETICAL MOTIVATION

Under the Chemmanur and Fulghieri (2006) framework, exchanges face a trade-off between the value resulting from a higher reputation and the value of expected cash flows from firms listing on the exchange. The optimal listing standards maximize the combination of these two offsetting values. Consider an alternative motivation under this theoretical approach. The ability to create a tiered structure might allow a market to alter this tradeoff between the reputation value and the value of expected cash flows.

Consider a single-tiered market with only one listing criterion, market capitalization, and the exchange lists only firms with a minimum market capitalization of $100M. If the exchange decides to create a new lower tier, with a minimum market capitalization of $25M for the new lower tier (ceteris paribus), the exchange doesn't appear to create materially different tiers. If the trading structure is the exact same, the exchange is simply allowing a new set of "lower reputation" firms to list in a trading environment with the same market frictions (again, assuming the same trading technology, the same trading rules, etc.). The exchange can then signal that the new lower tier is a specialized tier for smaller, emerging companies, while continuing to promote the higher listing standards of the original tier. Figure 2-1 shows this relationship.

Under the optimal standards for an exchange having only one tier, Point S denotes the point where the total value of listing fees plus reputation value is maximized. If the exchange were to lower listing standards, their cash flows from listing fees would

increase (from Point A to Point B) as they attracted new firms to list on their exchange (that were ineligible for listing under the old listing standards), but their reputation value would be reduced (from Point A to Point C) as investors view the exchange as becoming a "lower reputation" exchange. The trade-off between reputation value and value from listing fees would result in a shift along the Total Value Curve (from Point S to Point T), but a minimal change in the total value of the exchange. On the other hand, a tiered structure could have a different effect.

The creation of a lower tier could allow the exchange to maintain their "high reputation" while increasing their cash flows from listing fees. As long as the exchange successfully markets the lower tier as being a specialized market for emerging companies, while minimizing similarities with the higher tier, the exchange could allow new companies to list on the lower tier. If successful, their cash flow would increase (from Point A to Point B) while the reputation value would remain stable (from Point A to Point D). The end result would be an upward shift in total value from Point S to U.

In the case of NASDAQ, this effect could help explain the motivation to move away from its original single-tiered structure as first developed in 1971. In the early 1980s, as the NASDAQ firms began to diverge into distinct classes of larger and smaller firms, the NASDAQ divided into the NASDAQ National Market and the NASDAQ Small-Cap Market. NASDAQ's success with a tiered structure may have motivated European exchanges in Belgium, Germany, France, and Holland to adopt similar market segments in order to attract high growth companies (Mendoza, 2007). Today, the dominant European exchange using a tiered structure is the London Stock Exchange with its Alternative Investment Market.

Conversely, now consider the same single-tiered market with only one listing criteria, market capitalization, and the exchange lists only firms with a minimum market capitalization of $100M. If the exchange creates a second higher tier, with a minimum market capitalization of $250M for the new higher tier (ceteris paribus), the exchange doesn't appear to create materially different tiers. If the trading structure is still the exact same, the exchange is simply reclassifying an already existing subset of its listed companies as being "higher reputation" firms, and this new tier still has the same market frictions (again, assuming the same trading technology, the same trading rules, etc.). The exchange can then signal that the new higher tier is a "blue chip" tier for larger, established companies, in an attempt to compete with other high reputation exchanges. The exchange would promote the higher listing standards ("a blue chip market for blue chip companies") in an effort to enhance their reputation value.

If successful, the exchange would reap a higher reputation value by promoting the virtues of the highest tier, while continuing to collect listing fees from the lowest tier. Figure 2-2 shows this relationship. Under the optimal standards for an exchange having only one tier, Point S denotes the point where the total value of listing fees plus reputation value is maximized. If the exchange were to increase their listing standards, their reputation value would increase (from Point A to Point B), but their cash flows from listing fees would be reduced (from Point A to Point C) as some firms would no longer meet the higher listing standards. The trade-off between reputation value and cash flows from listing fees would result in a shift along the Total Value Curve (from Point S to Point T), but a minimal change in the total value of the exchange. On the other hand, a tiered structure could have a different effect.

The creation of a higher tier could allow the exchange to continue collecting cash flows from listed companies that do not exceed the "high reputation" threshold of the upper tier. As a result, the value from listing fees would remain stable (a shift from Point A to Point D). The reputation value would increase (from Point A to Point B) if the exchange could successfully promote the merits of the higher tier while minimizing awareness of the similarities with the lower tier. The end result would be an upward shift in total value from Point S to Point U.

In this example, the tiers might not exhibit market quality differences beyond the market capitalization and public float of stocks listed on each tier. The entire market, regardless of tier, could be viewed as one big market with all stocks exhibiting the same trading frictions, differing only by a scale effect (i.e. the tiers are little more than liquidity tiers with the same frictions). Thus, the exchange could maximize their total value by implementing higher standards through the creation of an upper tier.

Under this scenario, the exchange benefits by establishing a tiered-structure and promoting the benefits of a high-reputation, upper tier in order to enhance their reputation value while maintaining their cash flows from listing fees. If so, the only material differences in market quality between the tiers, ceteris paribus, should result primarily from firm size and public float. The entire marketplace, regardless of tier, could be viewed as one big market with all stocks exhibiting the same trading frictions, but differing only in scale (i.e. the tiers are little more than liquidity tiers with similar trading frictions). This "Reputation Hypothesis" may explain NASDAQ's motivation for a tiered market structure.

NASDAQ's current competitive environment, defined by a highly competitive marketplace for new listings and an ongoing wave of consolidation in exchanges and trading platforms (in an attempt to garner market share), might have created the need to create the new Global Select Market. Having already restructured to gain a competitive advantage at the lower end of the market, the GSM restructuring appears aimed at gaining a competitive advantage at the upper end of the market.

CHAPTER 3

HYPOTHESES

While the theoretical motivation simply provides a justification for the reason why NASDAQ restructured (i.e. to enhance their reputation value), the empirical portion of this essay attempts to measure whether or not the restructuring actually enhanced NASDAQ's reputation. Two techniques previously used to measure an impact on a firm's reputation include visibility and competitiveness approaches.

For publicly traded firms, an asset pricing approach measures changes in a firm's "visibility" to serve as a proxy for changes in their reputation. Since NASDAQ began publicly trading on the NASDAQ Stock Market in 2005, any reputation effect can be measured directly on NASDAQ's stock. If NASDAQ's restructuring was designed to draw new attention to their marketplace, any positive reputation impact should result in a positive stock pricing effect. Additionally, the reputation effect could be indirect, specifically to stocks listed on the newest NASDAQ tier.

While researchers have yet to specifically measure any reputation effect with exchanges, ample evidence does exist that reputation (i.e. visibility) is priced in stocks. Kadlec and McConnell (1994) find that visibility changes are an important determinant in explaining firm decisions to move their listing from NASDAQ to NYSE. Thus, firms seek the reputation effect from moving to the higher-reputation setting (i.e. from NASDAQ to NYSE). Jain and Kim (2006) find that firms experience positive cumulative abnormal returns upon switching their listing from NASDAQ to the NYSE.

Papaioannou et al. (2008) analyze changes in operating performance resulting from the increased visibility of firms moving their listing to NYSE. They find that

increased visibility leads to increased operating performance. Likewise, Baker, Powell, and Weaver (1999) argue that visibility is important to firms. The increased visibility may increase information flow about a firm (reduces uncertainty) and enhance the efficiency of trading in their stock (reduces information asymmetries). However, they find that the increased visibility results from changes in market capitalization, and not simply from the listing decision.

Thus, the following hypotheses will be tested:

H_0: The NASDAQ reorganization had no positive impact on their reputation (i.e. no indirect reputation effect).

H_1: The NASDAQ reorganization had a positive impact on their reputation through the stocks listed on their exchange (i.e. an indirect reputation effect).

On the other hand, Barber and Odean (2008) propose evidence that any asset pricing effect resulting from the restructuring may be only temporary, resulting from the increased attention around the timing of the announcement. They show that investors are net buyers of attention-grabbing stocks, and that attention-driven buying does not result in superior returns. Consequently, any reputation effect may simply be a temporary attention effect due to the restructuring announcement. Therefore, the asset pricing analysis will include determining if any reputation effect is permanent or temporary.

For exchanges in particular, the competitiveness approach measures changes in their ability to compete for listings, and this change in competitiveness also serves as a proxy for reputation. NASDAQ's enhanced ability to attract new listings (from existing or new public firms) could lead investors to expect higher future cash flows. Easley and O'Hara (2006) state that exchanges collect revenues both through listing fees and

transaction fees, both of which would increase if a higher proportion of firms choose to list on NASDAQ. Higher cash flows could lead to an expectation of higher earnings, and thus to a positive impact to their stock price as investors upwardly revise their valuations of the exchange's stock.

Under the Chemmanur and Fulghieri (2006) framework, high-reputation exchanges set high listing and disclosure requirements, resulting in more precise information available to outsiders when evaluating firms listed on the exchange. Exchanges can attempt to use market segments (tiers) to enhance their reputation impact by implementing higher standards and forming a new higher tier. If successful, the exchange could exploit the new tier to better compete for listings with other high-reputation exchanges. Coffee (2002) refers to this competition through higher listing standards as the "race to the top" scenario. Thus, the following hypotheses will be tested to determine if the restructuring had any impact on NASDAQ's reputation through their ability to attract new listings:

H_0: The NASDAQ reorganization had no impact on their competitiveness in the marketplace for listings (i.e. no reputation effect).

H_2: The NASDAQ reorganization had a positive impact on their competitiveness in the marketplace for listings (i.e. a positive reputation effect).

CHAPTER 4

DATA SOURCES

Essay Two has two sample sets. The first set consists of all NASDAQ-listed stocks that were listed on the GSM and NGM for the six months surrounding the restructuring. The GSM is important for analyzing any potential positive asset pricing impact when NNM stocks were "elevated" to the new GSM. The remaining NNM stocks that were "left behind" in the new NGM are also analyzed in order to determine if they had any negative asset pricing impact for not meeting the new higher standards of the GSM.

The Center for Research in Security Prices (CRSP) database serves as the primary data source for identifying all NASDAQ-listed stocks, as well as to which tier they are assigned. The sample set consists of the 1,210 stocks listed on the GSM and the 1,354 stocks listed on the NGM from 1 July – 31 Dec 2006 (thus eliminating the NCM). This provides a total of 2,564 stocks for the asset pricing analysis via event study.

CHAPTER 5

METHODOLOGY

A two-step procedure is used to calculate abnormal returns using the Fama-French three-factor model (1993) as a benchmark. In the first stage, the benchmark parameters are estimated, using a 255-day estimation period that ends 46 days before each event date, using equation 1.

$$R_{jt} = \hat{\alpha}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h} HML_t + \varepsilon_t \quad (1)$$

In equation 1, R_{mt} represents the rate of return of a market index (S&P 500) for day t, SMB_t represents the average return on three small market-capitalization portfolios minus the average return on three large market-capitalization portfolios, and HML_t represents the average return on two high book-to-market equity portfolios minus the average return on two low book-to-market equity portfolios, and ε_t is a random variable assumed to have an expected value of zero, be homoskedastic, and be uncorrelated with R_{mt}, R_{kt} (for any $k \neq t$), or ε_s (for any $s \neq 1$). Abnormal returns are then estimated in the second stage. The abnormal return will be calculated using equation 2.

$$A_{jt} = R_{jt} - \hat{R}_{jt} = R_{jt} - \left(\hat{\alpha}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h} HML_t\right) \quad (2)$$

For the event study analysis, I use four measures to analyze abnormal returns in order to identify any potential asset pricing effect resulting from NASDAQ's restructuring. These measures are average abnormal return, cumulative average

abnormal return, buy-an-hold abnormal return, and average compounded abnormal return. The functional forms of each abnormal measure are displayed in equations 3-6.

Average Abnormal Return:

$$AAR_t = \frac{\sum_{j=1}^{N} A_{jt}}{N} \tag{3}$$

Cumulative Average Abnormal Return:

$$CAAR_t = \frac{1}{N}\sum_{j=1}^{N}\sum_{t=T_1}^{T_2} A_{jt} \tag{4}$$

Buy-and-Hold Abnormal Return:

$$BHAR_{j,T_1,T_2} = \left[\prod_{t=T_1}^{T_2}\left(1+R_{jt}\right)-1\right] - \left[\left(1+\hat{a}_j\right)^{(T_2-T_1+1)}-1\right] - \hat{\beta}_j\left[\prod_{t=T_1}^{T_2}\left(1+R_{mt}\right)-1\right] \tag{5}$$

Average Compounded Abnormal Return:

$$ACAR_{T1,T2} = \frac{1}{N}\sum_{j=1}^{N} BHAR_{j,T1,T2} \tag{6}$$

The event study test statistic is the non-parametric generalized sign test (Cowan, 1992). The generalized sign test controls for the normal asymmetry between positive and negative returns during the estimation period. The generalized sign test is a better test for event studies than the Patell test (1976) due to the Patell test's assumption of cross-sectional independence in the abnormal return.

For sensitivity analyses, I use the Fama-French four-factor model with a momentum factor, recommended by Carhart (1997), to measure abnormal returns.

$$R_{jt} = \hat{\alpha}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h} HML_t + \hat{u}_j UMD_t + \varepsilon_t \quad (7)$$

In equation 7, $R_{mt,}$ $SMB_{t,}$ and HML_t represents the same variables as the Fama-French three-factor model. In addition, UMD_t represents the average return on two high prior-return portfolios minus the average return on two low prior-return portfolios. Additionally, ε_t is a random variable assumed to have an expected value of zero, homoskedastic, and uncorrelated with R_{mt}, R_{kt} (for any $k \neq t$), or ε_s (for any $s \neq 1$). Abnormal returns are then estimated in the second stage. The abnormal return will be calculated using equation 7.

$$A_{jt} = R_{jt} - \hat{R}_{jt} = R_{jt} - \left(\hat{\alpha}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h}_j HML_t + \hat{u}_j UMD_t\right) \quad (8)$$

The same four measures of abnormal return (equations 3-6) will be used to measure any asset pricing impact due to NASDAQ's restructuring.

I test for an asset pricing impact using three alternate event dates. The *Press Release Date* is the date of NASDAQ's original press release announcing the restructuring (15 Feb 2005). The *Identification Date* is the date NASDAQ identified the specific stocks designated for listing on the new GSM (26 June 2006). The *Effective Date* is first trading day of the new NASDAQ structure (3 July 2006). As a component of the sensitivity analysis, these alternate dates will consider whether any pricing impact occurred on the initial announcement of the restructuring, or on the date that specific stocks were identified for each tier, rather than simply the first day of trading on the new tier.

The second data set consists of all IPOs that went public in the five years surrounding the NASDAQ reorganization (30 months prior until 30 months after). The Field-Ritter dataset identifies all IPOs during this time period. I exclude all stocks without a CRSP share class code of 11 or 12 (excludes all closed end funds, REITs, certificates, ADRs, unit trusts, etc.). The CRSP and Compustat databases provide additional company-specific data used in the multivariate analysis.

An initial analysis of the IPO market from 2004-2008 indicates that a total of 803 firms conducted IPOs in the 5-year period. A total of 462 firms conducted IPOs in the thirty months before the restructuring, compared with 341 afterwards. During the 5-year sample period, NASDAQ attracted 40% of their IPOs after the restructuring, versus 60% in the same timeframe before it, implying that the restructuring may not have helped them become more competitive.

This analysis does take into consideration that not all stocks qualify for listing on all three major exchanges (NYSE, AMEX, and NASDAQ). Many firms qualify for listing on NASDAQ, but not NYSE, due to NASDAQ's lower listing requirements. For the analysis in the results section, these smaller firms were excluded from the sample set, thereby establishing a condition that firms chose NASDAQ conditional upon their being qualified to choose between NASDAQ, AMEX, and NYSE.

Previous research by Corwin and Harris (2001) on IPO exchange listing choice identified that IPOs are more likely to list on the same exchange as their industry peers. Additionally, smaller and riskier firms tend to list on NASDAQ. Consequently, the Corwin and Harris study provides three controls for examining any potential impact of

the restructuring on NASDAQ's competitiveness (industry concentration, firm size, and firm risk).

For this analysis, I'll conduct a probit model using the control variables identified in the Corwin and Harris (2001) study. The probit model takes the form of:

$$Prob(NASDAQ = 1) = \Phi(\underline{\gamma} * \underline{Z})$$

where $\Phi(-)$ denotes the standard normal distribution, $\underline{\gamma}$ denotes a vector of coefficients, and $\underline{Z}$ denotes a vector of independent (i.e. explanatory) variables. In this analysis, the dependent variable will equal one if the IPO listed on NASDAQ, and will equal zero otherwise (i.e. the firm chose to list on NYSE or AMEX). The explanatory variables comprising $\underline{Z}$ will include:

-*NASDAQ industry share*: indicates the percentage of firms within a company's industry, using the four-digit SIC to identify industry, that are listed on NASDAQ (peer-firm listings),

- *Market value*: indicates the IPO's post-listing market value (shares outstanding times share price),

-*Standard deviation*: indicates the IPO's level of risk by using the standard deviation, as calculated using the five-day close-to-close returns in the 100 trading days immediately following its listing,

-*Post_Restructuring_IPO*: indicates a dummy variable equal to one if the IPO occurred after 1 July 2006, and equal zero to otherwise; this variable is the variable of interest, and will be interpreted as support for H_2 (i.e. the restructuring enhanced NASDAQ's reputation) if positive and significant.

For sensitivity analysis, I also conduct a logistic regression model using the same functional form.

CHAPTER 6

RESULTS

The results of the event study on the NASDAQ restructuring, first focusing on the Global Select Market stocks, are reported in Table 2-1. Panel A shows the announcement effect when NASDAQ first announced the restructuring on 15 February, 2006. At the initial announcement, NASDAQ did not specify which firms would be listed on which tiers. While the event study results do indicate statistically significant negative returns for GSM stocks in the days following the initial announcement, the negative returns are consistent with the overall movement in GSM stocks in the days leading up to the press release. On average, GSM stocks had a cumulative abnormal return of -2.25% in the 30 trading days leading up to the announcement. If you reset the abnormal return to zero after the close of trading the day before the announcement, the GSM stocks continued, on average, to have a -2.96% abnormal return over the subsequent 30 trading days.

Similarly, Panel B shows the results around the date NASDAQ identified the stocks that would migrate to the GSM. The results indicate the opposite effect around the identification date. In the 30 trading days after the announcement, GSM stocks, on average, had positive abnormal returns. Nevertheless, this pattern follows the GSM market-wide pattern in the days leading up to the announcement. In the 30 trading days before the identification date, GSM stocks had accumulated, on average, an abnormal return of 3.44%. If you reset the abnormal return on the close of trading on the day preceding NASDAQ identifying the future GSM stocks, the stocks only gained on average an additional 1.25% of abnormal return in the next 30 trading days.

Panel C shows the results on the effective date that trading commenced on the new GSM, July 3, 2006. These results are consistent with the identification date (overall positive movement in the GSM stock prices in the 30 days leading up to the announcement). Given the short timeframe between the identification date and the announcement date (one trading week), this result is not surprising.

Table 2-2 shows the results of a sensitivity test using the Fama-French Four Factor model, which includes Carhart's momentum factor. The findings for all three announcement dates are similar to the three-factor model. GSM stocks show post-announcement abnormal return patterns that are consistent with the short-term momentum within the GSM group of stocks leading up to the announcement. Stocks are falling both before and after the press release, and rising both before and after the identification and effective dates. These results are displayed graphically in Figures 2-3 and 2-4. Figure 2-3 shows the abnormal returns, starting from the event days, whereas Figure 2-4 shows the abnormal returns dating back to the beginning (-30) of the pre-event window.

The stocks eventually designated for the NASDAQ Global Market show a complete opposite pattern around the same event dates. Table 2-3 shows the results of an event study on the 1,354 stocks that were "left behind" in the middle tier as a result of the restructuring. While the GSM stocks were clearly trending downward as a group leading up to the February 15, 2006 press release, the NGM stocks were trending upward. The results in Panel A indicate that NGM stocks had an average abnormal return of 1.9% in the 30 trading days leading up to the press release, and sustained that trend for an additional 1.25% of abnormal return in the 30 trading days after the announcement.

Similarly, as shown in Panels B-C, the downward trend in NGM stock prices in the 30 trading days before the identification and announcement dates was sustained over the subsequent 30 trading days. The Fama-French Four Factor models, shown in Table 2-4, show the same trends. Figures 2-5 and 2-6 show the results graphically. What appears in Figure 2-5 to be a positive announcement effect, followed by a sustained abnormal return in the subsequent short-term, appears in Figure 2-6 to be little more than short-term price momentum. The findings indicate that you have two significant portions of the NASDAQ market moving clearly in two different directions, over two different timeframes, as NASDAQ was initially announcing, and then implementing, a major reorganization of their listing environment.

These event study results seem inconsistent with any positive reputation effect NASDAQ may have intended. While a brief analysis of the 0-30 trading day window would seem to indicate that GSM stocks may have benefited from being moved onto the new tier, and that the NGM stocks may have suffered, their abnormal return patterns were no different than in the weeks leading up to the announcement than they were immediately afterwards. Figure 2-7 shows abnormal returns for GSM and NGM stocks over the 61-day window surrounding the identification and effective dates.

These results seem consistent with two possible explanations. First, the reorganization had little to no impact on any NASDAQ-listed firms, as their pricing appeared relatively unaffected. Any positive (negative) pricing impact for GSM (NGM) stocks could be explained away by technical analysis of short-term price movements. Second, the market may have inferred which companies would fall onto which tiers, and

prices started moving well before the firms were officially announced as moving to the GSM or NGM.

If NASDAQ's new tiered structure benefits firms with any enhanced reputation effect, a better test would be to analyze when firms cross from one tier into a new tier. As NCM or NGM firms grow, become more profitable, and their stock becomes more liquid, they would meet the higher listing standards of the NGM or GSM. With a subsequent move onto a higher tier with better visibility, they could reap a positive impact on their stock price through higher levels of investor participation. Conversely, as GSM or NGM firms become less profitable, and their stock becomes less liquid, they would fail to meet the continued listing standards of the GSM or NGM, and would drop to a lower tier. With a subsequent move onto a lower tier with less visibility, they could face a negative impact on their stock price.

Tables 2-5 and 2-6 explore this effect as firms cross these boundaries. Table 2-5 focuses on firms moving from the NCM to the NGM, or from the NGM to the GSM. Panel A reports abnormal returns from the date the firm announced its intention to move onto a higher tier, and Panel B reports returns from the effective date (usually only a lag of 1-2 trading days). Most firms announce a rise to a new tier using a formal press release, a NASDAQ announcement, or an SEC filing. Some firms choose not to announce the move, or the announcement could not be located. Thus, the number of observations for the announcement date is slightly smaller than for the effective date. If neither an announcement nor an effective date could be established, the firm was thrown out of the sample.

The analysis from Table 2-5 indicates that upon announcing a move to a higher tier, and upon the beginning of trading on the new tier, firms have an immediate positive, but non-significant announcement effect, followed by a short-term reversal over the next 30 trading days. Both event day windows (-1 to 0, and 0 to +1) are insignificant for both the announcement and effective dates, and using both the three-factor and four-factor models. The longer post-event window (+1 to +30) is significant for the effective date, and approaching significance for the announcement date.

Surprisingly, NASDAQ stocks appear to have a negative pricing impact when they move onto a higher tier. Table 2-6 displays results for when stocks move to a lower tier. Even more surprisingly, NASDAQ stocks appear to have a strong positive price impact when dropping to a lower tier. While the immediate price impact doesn't appear to happen, NASDAQ stocks that move onto a lower tier appreciate noticeably in the 30 trading days immediately after both the announcement and the switch. This finding is significant in 6 of the 8 specifications (three-factor vs. four-factor models, announcement vs. effective dates, and cumulative vs. compound returns).

Figure 2-8 shows the stock pricing impact. Note that in contrast to the NASDAQ press release, announcement, and effective dates for starting the new tiered structure, firms crossing tiers show some momentum in their return patterns in the before two weeks prior to switching, and continued momentum immediately afterwards. Firms that drop to a lower tier see a slight price increase, and firms that rise to a higher tier see their prices fall slightly. However, this analysis does not provide strong evidence of a pricing impact given the small sample size and the influence of many small price stocks (i.e. penny stocks) within the sample.

Thus far, the analysis doesn't indicate any positive reputation effect for NASDAQ firms resulting from the new tiered structure. The announcement effects around the restructuring are more consistent with a momentum effect within tiers, rather than an immediate impact resulting from being associated with the NASDAQ listing environment. Further, NASDAQ stocks moving down to lower tiers seem to benefit, while firms moving up towards (or onto) the highest tier seem to incur a cost.

Another method of testing for any benefits to NASDAQ's reputation resulting from having the "highest listing standards in the world" is to test for an enhanced competitiveness in the marketplace for listings. If Bob Greifeld's promotion of the new tier as "a blue chip market for blue chip companies" truly signaled to the marketplace that NASDAQ is the best listing environment for new publicly traded firms, NASDAQ should be better able to compete for IPOs.

Tables 2-7 through 2-9 present the findings of an analysis of NASDAQ's ability to compete for IPOs after the reorganization. Using the same approach as Corwin & Harris (2001), I analyze the probability of NASDAQ attracting a listing around the restructuring timeframe. Table 2-7 provides descriptive statistics on market for IPOs from 2004-2008.

NASDAQ has the vast majority of IPO listings over the sample period, but the IPO market has slowed down since the July 2006 restructuring. The total number of IPOs in the 30 months immediately after NASDAQ's restructuring dropped by over 26% from the preceding 30 months. Additionally, their rate of attracting IPOs has dropped from 67.7% to 60.1%.

While this initial analysis indicates the restructuring hasn't helped NASDAQ to better attract new IPOs, the Corwin & Harris (2001) approach provides a better framework. They found that smaller, riskier firms tend to list on NASDAQ, and firms tend to list on the exchange where their industry piers are listed. Table 2-8 provides correlations on these variables for all IPOs from 2004-2008. Consistent with their findings, the analysis shows a negative correlation between firm size and a firm listing on NASDAQ. The analysis also shows positive correlations between the concentration of industry peers being listed on NASDAQ and the risk of a firm's stock.

Table 2-9 shows both Probit and Logit estimations for the probability of NASDAQ attracting an IPO. Model 1 shows a significant relationship between the same variables previously identified in the literature by Corwin & Harris (2001). All variable coefficients are in the expected directions. Larger firms are associated with a lower probability of NASDAQ attracting the IPO, and greater risk and greater industry concentration on NASDAQ are associated with a higher probability of NASDAQ attracting the IPO. The model is significant with a Log Likelihood value of 409.77.

Model 2 includes the dummy variable (Post Reorg) for whether or not the IPO listed after NASDAQ's restructuring. The variable loads as significant and negative, indicating that post-reorganization, NASDAQ may have a lower probability of attracting the IPO. Models 4 and 5 repeat the analysis using a logistic regression approach as a sensitivity analysis. As with the Probit model, all coefficients are significant, in the same direction, and the overall model is highly significant. All four specifications have similar Psuedo r^2, and the models with the Post Reorg variable improve slightly on the Psuedo r^2.

A supplemental test of the control variables (not reported) indicates that IPO firm sizes increased over the later half of the sample period. Since larger companies have been shown to have a higher probability of listing on the NYSE (Corwin & Harris, 2001), larger firm sizes in the second half of the sample period could also help explain the lower probability of NASDAQ attracting an IPO, independent of any restructuring. Since IPO firm sizes increased over time, Model 3 provides an interaction variable that helps account for this growth over the later portion of the sample period. I create the interaction variable by multiplying the firm size (Ln(MktCap)) by the dummy variable for the time frame after the restructuring (PostReorg).

Given a significantly larger average firm size in the later half of the sample period, the interaction variable should control for this effect. The analysis from Model 3 indicates that the interaction variable is significantly different than zero, and that the variable of interest (PostReorg) is still significant, and negative. This finding is consistent with the notion that the restructuring may not have helped NASDAQ attract new IPO listings. This analysis does not clearly demonstrate causality, but it does indicate that NASDAQ appears to have a diminished competitiveness in the IPO market during the same time frame after the restructuring.

CHAPTER 7

CONCLUSION

NASDAQ intended for their restructuring to signal to the marketplace that it was a world-class marketplace with the highest listing standards in the world. As a result, NASDAQ hoped to better compete for newly listed firms, and existing NASDAQ firms could benefit from the reputation effect as NASDAQ moved to better compete with NYSE. The empirical data is not consistent with a reputation effect resulting from the restructuring. NASDAQ firms received no apparent asset pricing impact from a) the initial restructuring announcement, b) when the firms were identified for each tier, and c) when trading commenced under the new listing structure.

In fact, whatever momentum the NASDAQ-listed stocks had (before the announcements) appeared relatively uninterrupted as a result of NASDAQ's press releases over the Spring and Summer of 2006. Additionally, NASDAQ firms appear to benefit when moving down the scale towards the bottom tier, and to suffer when moving towards the upper tier. This finding is inconsistent with either a reputation effect or a visibility effect that one would expect when moving up towards the top of the listing environment or down towards the bottom.

As a marketplace, the evidence from this study is consistent with the notion that the restructuring appears to have had no positive impact on NASDAQ's ability to attract new IPO listings. NASDAQ does not appear to be more competitive for new listings than it was before that restructuring. Chuck Jaffe may be right; the restructuring may very well have been about marketing. Unfortunately, the marketing doesn't appear to

have helped. The results of this study fail to reject the null hypothesis that the NASDAQ reorganization had no positive impact on their reputation (i.e. no reputation effect).

Future studies to build upon this essay could focus on a number of issues. First, why did the tiers appear to move in different directions? When the NGM stocks were moving up, the GSM stocks were moving down, and vice versa. Was this an anomaly restricted to this sample period, or do these patterns occur more often? If so, what is the source of the tiers exhibiting movements in opposite directions? Second, the analysis is consistent with the idea that NASDAQ may not be more competitive in the IPO market as a result of the restructuring. Further tests of this finding could further isolate the cause-effect relationship, if any, between the restructuring and competition in the IPO marketplace.

A related study could look at NASDAQ's ability to keep firms from moving to the NYSE. If the IPO market is indicative of an offensive approach towards seeking greater market share, an alternative outcome would be a defensive approach towards protecting the market share you currently have. Plus, NASDAQ's desire from the restructuring may be to compete at the top of the market for large (blue chip) firms, while accepting risk against NYSE Arca regarding market share in smaller firms. A future study could isolate the largest firms and NASDAQ's ability to compete for their listings.

Table 2-1: Event Study Results, NASDAQ Global Select Market (FF3FM).

This table reports the results of an event study on the creation of the new three-tiered listing structure for the NASDAQ Stock Exchange, specifically focusing on firms that would become listed on the highest tier (Global Select Market). The *Press Release Date* column reports the average and cumulative abnormal returns for the former NASDAQ National Market firms that would eventually qualify for listing on the Global Select Market. The event date is February 15th, 2006, the date of NASDAQ's initial press release announcing the new tier. The *Identification Date* column reports the average and cumulative abnormal returns for same NASDAQ National Market firms that would eventually qualify for listing on the Global Select Market. The event date is June 26th, 2006, the date NASDAQ identified which firms qualified for listing on the Global Select Market. The *Effective Date* column reports the average and cumulative abnormal returns for when the same firms began trading on the Global Select Market. The event date is July 3rd, 2006, the date that NASDAQ initiated trading on the new Global Select Market.

Abnormal returns are calculated using the Fama-French 3-Factor Model:

$$A_{jt} = R_{jt} - \hat{R}_{jt} = R_{jt} - \left(\hat{\alpha}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h} HML_t\right)$$

	Panel A: Press Release Date				Panel B: Identification Date				Panel C: Effective Date			
Day	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic
-30	-0.03%	-0.03%	581:628	0.009	0.28%	0.28%	733:487	8.601***	0.28%	0.28%	720:500	7.851***
-15	-0.08%	-2.37%	501:709	-4.622***	-0.16%	1.75%	543:679	-2.342**	0.51%	1.62%	782:440	11.341***
-14	0.04%	-2.33%	585:625	0.212	0.41%	2.16%	800:422	12.376***	0.74%	2.36%	826:396	13.861***
-13	-0.16%	-2.49%	522:688	-3.413***	0.15%	2.31%	675:547	5.218***	-0.05%	2.31%	531:691	-3.034***
-12	-0.39%	-2.88%	438:772	-8.247***	0.57%	2.88%	797:425	12.204***	-0.11%	2.20%	542:680	-2.404**
-11	-0.28%	-3.16%	479:731	-5.888***	-0.23%	2.65%	502:720	-4.690***	-0.22%	1.98%	532:690	-2.976***
-10	-0.05%	-3.21%	549:661	-1.86*	0.51%	3.16%	787:435	11.632***	0.09%	2.07%	646:576	3.552***
-9	-0.20%	-3.41%	505:705	-4.392***	0.75%	3.91%	824:398	13.751***	-0.10%	1.97%	612:610	1.605
-8	-0.08%	-3.49%	583:627	0.097	-0.05%	3.86%	531:691	-3.029***	-0.02%	1.95%	527:695	-3.263***
-7	0.07%	-3.42%	595:615	0.787	-0.13%	3.73%	543:679	-2.342**	0.10%	2.05%	666:556	4.698***
-6	0.17%	-3.25%	690:520	6.253***	-0.22%	3.51%	530:692	-3.086***	-0.14%	1.91%	516:706	-3.893***
-5	0.11%	-3.14%	596:614	0.845	0.10%	3.61%	654:568	4.015***	0.34%	2.25%	713:509	7.389***
-4	-0.24%	-3.38%	491:719	-5.197***	-0.10%	3.51%	608:614	1.381	0.04%	2.29%	647:575	3.610***
-3	0.15%	-3.23%	707:503	7.231***	-0.02%	3.49%	519:703	-3.716***	0.14%	2.43%	668:554	4.812***
-2	0.11%	-3.12%	656:554	4.297***	0.09%	3.58%	659:563	4.301***	0.01%	2.44%	593:629	0.517
-1	0.04%	-2.25%	614:596	1.880*	-0.14%	3.44%	514:708	-4.003***	-0.56%	1.88%	417:805	-9.562***
0	-0.01%	-0.01%	553:657	-1.63	0.33%	0.33%	709:513	7.165***	-0.23%	-0.23%	499:723	-4.866***
1	-0.19%	-0.20%	508:702	-4.219***	0.04%	0.37%	649:573	3.729***	-0.04%	-0.27%	579:643	-0.285
2	-0.32%	-0.52%	471:739	-6.348***	0.13%	0.50%	670:552	4.931***	-0.09%	-0.36%	567:655	-0.972
3	-0.25%	-0.77%	499:711	-4.737***	0.00%	0.50%	590:632	0.35	0.13%	-0.23%	694:528	6.301***
4	0.10%	-0.67%	667:543	4.930***	-0.57%	-0.07%	416:806	-9.615***	0.23%	0.00%	745:477	9.222***
5	-0.23%	-0.90%	484:726	-5.600***	-0.23%	-0.30%	497:725	-4.976***	0.14%	0.14%	627:595	2.464**
6	0.01%	-0.89%	549:661	-1.860*	-0.04%	-0.34%	582:640	-0.108	-0.11%	0.03%	565:657	-1.086
7	-0.06%	-0.95%	545:665	-2.090**	-0.09%	-0.43%	570:652	-0.796	0.19%	0.22%	715:507	7.504***
8	-0.21%	-1.16%	553:657	-1.63	0.13%	-0.30%	696:526	6.420***	0.16%	0.38%	709:513	7.160***
9	-0.06%	-1.22%	533:677	-2.78***	0.22%	-0.08%	741:481	8.997***	0.51%	0.89%	798:424	12.257***
10	-0.24%	-1.46%	476:734	-6.060***	0.14%	0.06%	622:600	2.182*	0.46%	1.35%	761:461	10.138***
11	-0.17%	-1.63%	492:718	-5.140***	-0.11%	-0.05%	569:653	-0.853	-0.11%	1.24%	588:634	0.231
12	-0.21%	-1.84%	556:653	-1.43	0.20%	0.15%	718:504	7.680***	0.04%	1.28%	652:570	3.896***
13	0.30%	-1.54%	734:475	8.816***	0.16%	0.31%	708:514	7.108***	0.16%	1.44%	697:525	6.473***
14	0.15%	-1.39%	678:531	5.593***	0.51%	0.82%	804:418	12.605***	0.26%	1.70%	668:554	4.812***
15	-0.01%	-1.40%	555:655	-1.515	0.45%	1.27%	760:462	10.086***	-0.03%	1.67%	561:661	-1.315
30	-0.32%	-2.96%	451:759	-7.499***	0.11%	1.25%	636:584	3.041***	0.21%	2.28%	621:597	2.234**
	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic
-30,-2	-3.12%	-8.304***	-3.42%	-9.052***	3.59%	11.517***	3.29%	11.345***	2.42%	10.196***	2.12%	9.337***
-1,0	0.03%	1.593	0.03%	1.362	0.19%	3.385***	0.18%	3.156***	-0.79%	-9.677***	-0.81%	-9.906***
0,+1	-0.20%	-3.356***	-0.20%	-3.413***	0.37%	8.024***	0.36%	7.737***	-0.27%	-3.034***	-0.28%	-3.148***
+1,+30	-2.94%	-7.902***	-3.14%	-9.398***	0.92%	6.592***	0.62%	5.619***	2.52%	9.680***	2.25%	8.592***

n=1,210 ***, **, ***** denotes statistical significance at the .1, .05, .and .01 levels of significance.

Table 2-2: Event Study Results, NASDAQ Global Select Market (FF4FM).

This table reports the results of an event study on the creation of the new three-tiered listing structure for the NASDAQ Stock Exchange, specifically focusing on firms that would become listed on the highest tier (Global Select Market). The *Press Release Date* column reports the average and cumulative abnormal returns for the former NASDAQ National Market firms that would eventually qualify for listing on the Global Select Market. The event date is February 15th, 2006, the date of NASDAQ's initial press release announcing the new tier. The *Identification Date* column reports the average and cumulative abnormal returns for same NASDAQ National Market firms that would eventually qualify for listing on the Global Select Market. The event date is June 26th, 2006, the date NASDAQ identified which firms qualified for listing on the Global Select Market. The *Effective Date* column reports the average and cumulative abnormal returns for when the same firms began trading on the Global Select Market. The event date is July 3rd, 2006, the date that NASDAQ initiated trading on the new Global Select Market.

Abnormal returns are calculated using the Fama-French 4-Factor Model:

$$A_{jt} = R_{jt} - \hat{R}_{jt} = R_{jt} - \left(\hat{\alpha}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h} HML_t + \hat{u}_j UMD_t\right)$$

	Panel A: Press Release Date				Panel B: Identification Date				Panel C: Effective Date			
Day	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic
-30	-0.03%	-0.03%	592:617	0.636	0.26%	0.26%	712:508	7.365***	0.28%	0.28%	721:499	7.868***
-15	-0.07%	-2.36%	505:705	-4.398***	-0.17%	1.62%	537:685	-2.717***	0.46%	1.47%	776:446	10.956***
-14	0.04%	-2.32%	583:627	0.09	0.41%	2.03%	791:431	11.829***	0.74%	2.21%	826:396	13.820***
-13	-0.16%	-2.48%	522:688	-3.420***	0.13%	2.16%	657:565	4.155***	-0.01%	2.20%	568:654	-0.955
-12	-0.39%	-2.87%	433:777	-8.541***	0.55%	2.71%	786:436	11.542***	-0.08%	2.12%	559:663	-1.47
-11	-0.28%	-3.15%	479:731	-5.894***	-0.23%	2.48%	505:717	-4.550***	-0.21%	1.91%	534:688	-2.902***
-10	-0.05%	-3.20%	544:666	-2.154**	0.48%	2.96%	781:441	11.256***	0.09%	2.00%	646:576	3.512***
-9	-0.20%	-3.40%	507:703	-4.283***	0.75%	3.71%	823:399	13.661***	-0.10%	1.90%	612:610	1.565
-8	-0.08%	-3.48%	576:634	-0.313	-0.02%	3.69%	558:664	-1.515	0.02%	1.92%	545:677	-2.272**
-7	0.07%	-3.41%	587:623	0.32	-0.11%	3.58%	551:671	-1.915*	0.10%	2.02%	665:557	4.600***
-6	0.18%	-3.23%	679:531	5.614***	-0.21%	3.37%	536:686	-2.774***	-0.12%	1.90%	528:694	-3.246***
-5	0.11%	-3.12%	590:620	0.493	0.10%	3.47%	654:568	3.983***	0.33%	2.23%	709:513	7.119***
-4	-0.23%	-3.35%	487:723	-5.434***	-0.10%	3.37%	612:610	1.578	0.03%	2.26%	644:578	3.397***
-3	0.16%	-3.19%	701:509	6.880***	0.00%	3.37%	532:690	-3.003**	0.12%	2.38%	668:554	4.772***
-2	0.11%	-3.08%	649:561	3.888***	0.09%	3.46%	660:562	4.327***	0.03%	2.41%	602:620	0.992
-1	0.04%	-3.04%	615:595	1.931*	-0.13%	3.33%	524:698	-3.462***	-0.56%	1.85%	416:806	-9.659***
0	-0.01%	-0.01%	553:657	-1.636	0.32%	0.32%	707:515	7.018***	-0.21%	-0.21%	503:719	-4.677***
1	-0.20%	-0.21%	526:684	-3.190***	0.03%	0.35%	641:581	3.239***	-0.06%	-0.27%	566:656	-1.07
2	-0.32%	-0.53%	471:739	-6.354***	0.12%	0.47%	667:555	4.728***	-0.10%	-0.37%	564:658	-1.184
3	-0.25%	-0.78%	504:706	-4.456***	0.02%	0.49%	601:621	0.948	0.09%	-0.28%	650:572	3.741***
4	0.10%	-0.68%	667:543	4.923***	-0.57%	-0.08%	418:804	-9.532***	0.19%	-0.09%	733:489	8.494***
5	-0.24%	-0.92%	491:719	-5.204***	-0.22%	-0.30%	502:720	-4.721***	0.15%	0.06%	633:589	2.767***
6	0.01%	-0.91%	546:664	-2.039**	-0.06%	-0.36%	571:651	-0.77	-0.09%	-0.03%	576:646	-0.497
7	-0.07%	-0.98%	538:672	-2.499**	-0.10%	-0.46%	559:663	-1.457	0.19%	0.16%	717:505	7.578***
8	-0.21%	-1.19%	552:658	-1.694*	0.09%	-0.37%	654:568	3.983***	0.16%	0.32%	712:510	7.291***
9	-0.07%	-1.26%	551:659	-1.751*	0.19%	-0.18%	729:493	8.278***	0.50%	0.82%	794:428	11.987***
10	-0.24%	-1.50%	477:733	-6.009***	0.15%	-0.03%	626:596	2.380**	0.46%	1.28%	757:465	9.868***
11	-0.17%	-1.67%	487:723	-5.434***	-0.10%	-0.13%	582:640	-0.14	-0.10%	1.18%	586:636	0.076
12	-0.20%	-1.87%	545:664	-2.070**	0.19%	0.06%	719:503	7.705***	0.03%	1.21%	653:569	3.913***
13	0.30%	-1.57%	740:469	9.155***	0.16%	0.22%	714:508	7.419***	0.13%	1.34%	674:548	5.115***
14	0.15%	-1.42%	671:538	5.183***	0.50%	0.72%	803:419	12.516***	0.27%	1.61%	668:554	4.772***
15	-0.01%	-1.43%	551:659	-1.751*	0.45%	1.17%	763:459	10.225***	-0.04%	1.57%	560:662	-1.413
30	-0.32%	-2.98%	458:752	-7.102***	0.11%	1.14%	634:586	2.895***	0.22%	2.20%	634:584	2.939***
	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic
-30,-2	-3.09%	-8.483***	-3.39%	-9.404***	3.45%	11.428***	3.14%	10.512***	2.40%	10.097***	2.09%	9.009***
-1,0	0.02%	1.586	0.03%	1.471	0.19%	3.525***	0.19%	3.468***	-0.77%	-9.602***	-0.79%	-9.774***
0,+1	-0.21%	-2.384**	-0.21%	-2.499**	0.35%	8.164***	0.35%	7.935***	-0.27%	-3.074***	-0.28%	-3.188***
+1,+30	-2.95%	-8.138***	-3.14%	-9.692***	0.82%	6.388***	0.53%	5.358***	2.39%	10.040***	2.13%	8.780***

Table 2-3: Event Study Results, NASDAQ Global Market (FF3FM).

This table reports the results of an event study on the creation of the new three-tiered listing structure for the NASDAQ Stock Exchange, specifically focusing on firms that would be recategorized as NASDAQ Global Market stocks (the middle tier). The *Press Release Date* column reports the average and cumulative abnormal returns for the former NASDAQ National Market firms that would eventually list on the Global Market. The event date is February 15th, 2006, the date of NASDAQ's initial press release announcing the new, three-tiered structure. The *Identification Date* column reports the average and cumulative abnormal returns for same NASDAQ National Market firms that would be recategorized as NASDAQ Global Market stocks. The event date is June 26th, 2006, the date that NASDAQ announced which specific NASDAQ National Market firms qualified for listing on the new Global Select Market (and by default, which didn't). The *Effective Date* column reports the average and cumulative abnormal returns for when the same former NASDAQ National Market firms began trading on the Global Market. The event date is July 3rd, 2006, the date that NASDAQ initiated trading on the Global Market.

Abnormal returns are calculated using the Fama-French 3-Factor Model:

$$A_{jt} = R_{jt} - \hat{R}_{jt} = R_{jt} - \left(\hat{\alpha}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h} HML_t\right)$$

	Panel A: Press Release Date				Panel B: Identification Date				Panel C: Effective Date			
Day	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic
-30	-0.37%	-0.37%	550:803	-5.230***	-0.18%	-0.18%	683:724	0.96	0.02%	0.02%	704:705	2.070**
-15	-0.11%	1.32%	608:745	-2.073**	0.14%	-0.24%	717:692	2.723***	-0.15%	-0.04%	733:677	3.591***
-14	0.04%	1.36%	587:766	-3.216***	-0.21%	-0.45%	689:720	1.229	-0.47%	-0.51%	680:730	0.764
-13	-0.04%	1.32%	595:758	-2.781***	-0.01%	-0.46%	696:713	1.602	-0.13%	-0.64%	641:769	-1.317
-12	0.39%	1.71%	629:724	-0.93	-0.23%	-0.69%	662:747	-0.212	0.03%	-0.61%	626:785	-2.141**
-11	0.10%	1.81%	639:714	-0.386	0.06%	-0.63%	694:715	1.496	-0.01%	-0.62%	661:750	-0.275
-10	0.13%	1.94%	662:691	0.866	-0.15%	-0.78%	725:684	3.150***	-0.18%	-0.80%	695:716	1.538
-9	0.12%	2.06%	661:692	0.811	-0.46%	-1.24%	674:735	0.428	0.10%	-0.70%	685:726	1.005
-8	-0.03%	2.03%	675:678	1.573	-0.14%	-1.38%	636:773	-1.599	-0.17%	-0.87%	612:799	-2.888**
-7	0.00%	2.03%	643:710	-0.168	0.02%	-1.36%	612:798	-2.904***	-0.21%	-1.08%	656:754	-0.517
-6	0.02%	2.05%	674:679	1.519	-0.02%	-1.38%	660:750	-0.344	-0.07%	-1.15%	627:784	-2.088**
-5	0.03%	2.08%	649:704	0.158	-0.18%	-1.56%	696:714	1.577	-0.25%	-1.40%	632:778	-1.797*
-4	0.00%	2.08%	633:720	-0.713	0.09%	-1.47%	688:722	1.15	-0.19%	-1.59%	655:756	-0.595
-3	-0.08%	2.00%	654:699	0.43	-0.17%	-1.64%	611:799	-2.958***	0.03%	-1.56%	700:711	1.805*
-2	0.19%	2.19%	688:665	2.281**	-0.20%	-1.84%	657:752	-0.479	-0.08%	-1.64%	650:761	-0.862
-1	-0.09%	2.10%	630:723	-0.876	-0.06%	-1.90%	623:787	-2.317**	0.29%	-1.35%	706:705	2.125**
0	0.15%	0.15%	651:702	0.267	-0.25%	-0.25%	630:779	-1.920*	-0.16%	-0.16%	651:760	-0.808
1	0.05%	0.20%	641:712	-0.277	-0.19%	-0.44%	650:760	-0.877	0.23%	0.07%	707:704	2.178**
2	0.03%	0.23%	627:726	-1.039	0.03%	-0.41%	705:705	2.057**	-0.01%	0.06%	697:714	1.645
3	-0.12%	0.11%	609:744	-2.019**	-0.08%	-0.49%	650:760	-0.877	-0.10%	-0.04%	729:682	3.351***
4	-0.05%	0.06%	632:721	-0.767	0.30%	-0.19%	710:700	2.323**	-0.31%	-0.35%	688:723	1.165
5	-0.04%	0.02%	616:737	-1.638	-0.17%	-0.36%	652:758	-0.771	0.09%	-0.26%	685:726	1.005
6	0.06%	0.08%	629:724	-0.93	0.23%	-0.13%	703:707	1.950*	-0.02%	-0.28%	657:754	-0.488
7	0.13%	0.21%	644:709	-0.114	-0.02%	-0.15%	689:721	1.203	-0.38%	-0.66%	641:770	-1.342
8	0.13%	0.34%	693:660	2.553**	-0.10%	-0.25%	730:680	3.390***	-0.23%	-0.89%	666:745	-0.008
9	0.07%	0.41%	637:716	-0.495	-0.31%	-0.56%	693:717	1.416	-0.25%	-1.14%	680:731	0.738
10	-0.01%	0.40%	630:723	-0.876	0.09%	-0.47%	683:727	0.883	-0.14%	-1.28%	700:711	1.805*
11	0.17%	0.57%	654:699	0.43	-0.02%	-0.49%	650:760	-0.877	0.07%	-1.21%	689:722	1.218
12	0.12%	0.69%	694:659	2.608***	-0.37%	-0.86%	645:765	-1.144	0.10%	-1.11%	757:654	4.844***
13	-0.05%	0.64%	700:653	2.934***	-0.23%	-1.09%	670:740	0.19	-0.20%	-1.31%	680:731	0.738
14	-0.03%	0.61%	667:686	1.138	-0.25%	-1.34%	672:738	0.296	-0.25%	-1.56%	616:795	-2.675***
15	0.02%	0.63%	674:679	1.519	-0.14%	-1.48%	707:703	2.163**	0.01%	-1.55%	671:740	0.258
30	0.19%	1.24%	638:716	-0.466	-0.08%	-2.46%	687:722	1.122	-0.10%	-2.92%	635:772	-1.563
	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic
-30,-2	2.21%	3.805***	2.01%	2.444**	-1.81%	-2.584***	-2.37%	-4.184***	-1.60%	-1.128	-2.13%	-3.315***
-1,0	0.06%	-0.44	0.07%	-0.604	-0.31%	-4.184***	-0.31%	-4.238***	0.14%	1.165	0.10%	0.898
0,+1	0.21%	0.594	0.21%	0.376	-0.43%	-2.798***	-0.44%	-3.011***	0.07%	0.685	0.06%	0.045
+1,+30	1.11%	2.363**	0.92%	0.622	-2.21%	0.296	-3.01%	-2.371**	-2.77%	-1.875*	-3.22%	-3.528***

n=1,354 *, **, *** denotes statistical significance at the .1, .05, and .01 levels of significance.

Table 2-4: Event Study Results, NASDAQ Global Market (FF4FM).

This table reports the results of an event study on the creation of the new three-tiered listing structure for the NASDAQ Stock Exchange, specifically focusing on firms that would be recategorized as NASDAQ Global Market stocks (the middle tier). The *Press Release Date* column reports the average and cumulative abnormal returns for the former NASDAQ National Market firms that would eventually list on the Global Market. The event date is February 15th, 2006, the date of NASDAQ's initial press release announcing the new, three-tiered structure. The *Identification Date* column reports the average and cumulative abnormal returns for same NASDAQ National Market firms that would be recategorized as NASDAQ Global Market stocks. The event date is June 26th, 2006, the date that NASDAQ announced which specific NASDAQ National Market firms qualified for listing on the new Global Select Market (and by default, which didn't). The *Effective Date* column reports the average and cumulative abnormal returns for when the same former NASDAQ National Market firms began trading on the Global Market. The event date is July 3rd, 2006, the date that NASDAQ initiated trading on the Global Market.

Abnormal returns are calculated using the Fama-French 4-Factor Model:

$$A_{jt} = R_{jt} - \hat{R}_{jt} = R_{jt} - \left(\hat{\alpha}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h} HML_t + \hat{u}_j UMD_t\right)$$

	Panel A: Press Release Date				Panel B: Identification Date				Panel C: Effective Date			
Day	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Positive/ Negative Ratio	Generalized Signed Z-statistic
-30	-0.31%	-0.31%	564:789	-4.483***	-0.22%	-0.22%	668:737	0.181	0.02%	0.02%	704:705	2.002**
-15	-0.14%	1.25%	586:767	-3.285***	0.12%	-0.45%	704:703	2.052**	-0.17%	-0.17%	701:709	1.816*
-14	0.04%	1.29%	585:768	-3.340***	-0.21%	-0.66%	679:728	0.717	-0.46%	-0.63%	677:733	0.536
-13	-0.03%	1.26%	601:752	-2.469**	-0.05%	-0.71%	681:726	0.824	-0.11%	-0.74%	655:755	-0.638
-12	0.39%	1.65%	623:730	-1.271	-0.26%	-0.97%	668:739	0.13	0.04%	-0.70%	626:785	-2.209**
-11	0.11%	1.76%	641:712	-0.292	0.06%	-0.91%	688:719	1.198	-0.01%	-0.71%	669:742	0.084
-10	0.11%	1.87%	665:688	1.014	-0.20%	-1.11%	704:703	2.052**	-0.17%	-0.88%	695:716	1.47
-9	0.13%	2.00%	662:691	0.851	-0.46%	-1.57%	673:734	0.397	0.10%	-0.78%	689:722	1.15
-8	-0.02%	1.98%	679:674	1.776*	-0.09%	-1.66%	647:760	-0.991	-0.15%	-0.93%	624:787	-2.316**
-7	-0.02%	1.96%	629:724	-0.945	0.06%	-1.60%	616:792	-2.671***	-0.20%	-1.13%	660:750	-0.371
-6	-0.03%	1.93%	664:689	0.96	0.00%	-1.60%	668:740	0.105	-0.06%	-1.19%	631:780	-1.943*
-5	0.02%	1.95%	638:715	-0.455	-0.18%	-1.78%	694:714	1.492	-0.26%	-1.45%	623:787	-2.345**
-4	-0.03%	1.92%	612:741	-1.870*	0.10%	-1.68%	689:719	1.226	-0.19%	-1.64%	652:759	-0.823
-3	-0.09%	1.83%	642:711	-0.237	-0.12%	-1.80%	630:778	-1.924*	0.02%	-1.62%	698:713	1.63
-2	0.17%	2.00%	669:684	1.232	-0.20%	-2.00%	657:750	-0.457	-0.07%	-1.69%	654:757	-0.716
-1	-0.10%	1.90%	623:730	-1.271	-0.04%	-2.04%	630:778	-1.924*	0.29%	-1.40%	707:704	2.110**
0	0.17%	0.17%	661:692	0.797	-0.26%	-0.26%	622:785	-2.326**	-0.15%	-0.15%	649:762	-0.983
1	0.10%	0.27%	650:703	0.198	-0.19%	-0.45%	651:757	-0.803	0.22%	0.07%	706:705	2.056**
2	0.02%	0.29%	626:727	-1.108	0.02%	-0.43%	695:713	1.546	-0.02%	0.05%	684:727	0.883
3	-0.11%	0.18%	619:734	-1.489	-0.06%	-0.49%	657:751	-0.483	-0.13%	-0.08%	710:701	2.270**
4	-0.05%	0.13%	624:729	-1.217	0.29%	-0.20%	706:702	2.133**	-0.34%	-0.42%	676:735	0.457
5	-0.02%	0.11%	619:734	-1.489	-0.14%	-0.34%	663:745	-0.162	0.09%	-0.33%	688:723	1.097
6	0.05%	0.16%	629:724	-0.945	0.21%	-0.13%	700:708	1.813*	-0.01%	-0.34%	666:745	-0.076
7	0.16%	0.32%	654:699	0.416	-0.03%	-0.16%	685:723	1.012	-0.37%	-0.71%	640:771	-1.463
8	0.10%	0.42%	688:665	2.266**	-0.15%	-0.31%	709:699	2.293**	-0.22%	-0.93%	670:741	0.137
9	0.13%	0.55%	656:697	0.525	-0.36%	-0.67%	675:733	0.478	-0.26%	-1.19%	680:731	0.67
10	0.02%	0.57%	650:703	0.198	0.10%	-0.57%	685:723	1.012	-0.15%	-1.34%	702:709	1.843*
11	0.16%	0.73%	652:701	0.307	0.00%	-0.57%	666:742	-0.002	0.06%	-1.28%	686:725	0.99
12	0.09%	0.82%	681:672	1.885*	-0.37%	-0.94%	640:768	-1.39	0.10%	-1.18%	758:653	4.829***
13	-0.09%	0.73%	689:664	2.321**	-0.22%	-1.16%	672:736	0.318	-0.22%	-1.40%	679:732	0.617
14	-0.05%	0.68%	659:694	0.688	-0.27%	-1.43%	670:738	0.211	-0.26%	-1.66%	613:798	-2.902***
15	-0.02%	0.66%	657:696	0.579	-0.14%	-1.57%	708:700	2.240**	0.00%	-1.66%	664:747	-0.183
30	0.17%	1.25%	627:727	-1.079	-0.08%	-2.60%	689:718	1.251	-0.10%	-3.06%	639:768	-1.417
	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic
-30,-2	1.78%	1.776*	1.98%	3.355***	-2.01%	-2.297**	-2.58%	-3.685***	-1.67%	-1.303	-2.22%	-3.489***
-1,0	0.07%	-0.564	0.07%	-0.564	-0.30%	-4.059***	-0.30%	-4.272***	0.14%	1.203	0.10%	0.51
0,+1	0.28%	1.014	0.28%	1.178	-0.45%	-3.258***	-0.46%	-3.418***	0.07%	0.777	0.06%	0.297
+1,+30	0.91%	0.553	1.11%	2.294**	-2.33%	-0.483	-3.16%	-2.671***	-2.91%	-1.623	-3.39%	-3.702***

n=1,354 ***, **, ***** denotes statistical significance at the .1, .05, and .01 levels of significance.

Table 2-5: Event Study Results, Stocks Moving to Higher Tier.

This table reports the results of an event study on the three-tiered listing structure for the NASDAQ Stock Exchange, specifically focusing on firms that dropped from a higher tier to a lower tier GSM to NGM, or NGM to NCM. The Announcement Date columns report the average and cumulative abnormal returns for the sample firms based on the date of the company's initial press release or SEC filing announcing the move. The Effective Date columns report the average and cumulative abnormal returns for the date the firms began trading on the lower tier. FF3FM represents calculations of abnormal returns using the Fama-French 3-Factor Model. FF4FM represents calculations of abnormal returns using the Fama-French 3-Factor Model, plus the Carhart Momentum Factor.

	Panel A: Announcement Date n=76								Panel B: Effective Date n=84							
	FF3FM				FF4FM				FF3FM				FF4FM			
Day	Mean Abnormal Return	Cumulative Abnormal Return	Generalized Signed Z-statistic		Mean Abnormal Return	Cumulative Abnormal Return	Generalized Signed Z-statistic		Mean Abnormal Return	Cumulative Abnormal Return	Generalized Signed Z-statistic		Mean Abnormal Return	Cumulative Abnormal Return	Generalized Signed Z-statistic	
-30	0.03%	0.03%	0.432		0.12%	0.12%	0.647		0.14%	0.14%	0.695		0.18%	0.18%	0.641	
-15	-0.94%	-0.81%	-2.543**		-0.97%	-1.20%	-2.326**		-0.47%	-0.37%	-1.543		-0.53%	-0.73%	-1.596	
-14	-0.09%	-0.90%	-0.92		-0.03%	-1.23%	-0.434		-0.04%	-0.41%	-0.303		0.00%	-0.73%	-0.353	
-13	-0.32%	-1.22%	0.162		-0.30%	-1.53%	0.107		-0.11%	-0.52%	-0.313		-0.06%	-0.79%	0.144	
-12	0.44%	-0.78%	-0.108		0.51%	-1.02%	0.107		-0.54%	-1.06%	-0.549		-0.54%	-1.33%	-0.602	
-11	0.76%	-0.02%	0.973		0.71%	-0.31%	0.918		0.53%	-0.53%	0.695		0.49%	-0.84%	0.641	
-10	0.64%	0.62%	0.432		0.62%	0.31%	-0.434		0.88%	0.35%	0.695		0.83%	-0.01%	0.641	
-9	-0.09%	0.53%	0.432		-0.10%	0.21%	0.377		-0.11%	0.24%	-1.046		-0.14%	-0.15%	-1.099	
-8	0.37%	0.90%	0.703		0.38%	0.59%	0.377		-0.50%	-0.26%	-1.046		-0.39%	-0.54%	-0.85	
-7	-0.71%	0.19%	-1.731*		-0.60%	-0.01%	-1.786*		-0.24%	-0.50%	-0.797		-0.28%	-0.82%	-0.85	
-6	-0.39%	-0.20%	0.162		-0.40%	-0.41%	-0.434		-0.39%	-0.89%	-0.051		-0.36%	-1.18%	-0.602	
-5	-0.07%	-0.27%	-0.92		-0.13%	-0.54%	-0.975		0.08%	-0.81%	0.446		-0.01%	-1.19%	0.144	
-4	-0.76%	-1.03%	-0.379		-0.88%	-1.42%	-0.434		-0.01%	-0.82%	-0.311		-0.09%	-1.28%	-1.099	
-3	0.40%	-0.63%	0.703		0.38%	-1.04%	0.377		-0.02%	-0.84%	-0.051		-0.03%	-1.31%	-0.105	
-2	-0.59%	-1.22%	-0.108		-0.61%	-1.65%	-0.434		-0.17%	-1.01%	-0.549		-0.09%	-1.40%	-0.105	
-1	-0.25%	-1.47%	-0.92		-0.28%	-1.93%	-0.704		-0.67%	-1.68%	-0.797		-0.72%	-2.12%	-1.099	
0	0.74%	-0.73%	1.244		0.74%	-1.19%	1.188		0.61%	-1.07%	1.192		0.57%	-1.55%	0.89	
1	-0.71%	-1.44%	-0.649		-0.77%	-1.96%	-1.245		-0.59%	-1.66%	0.081		-0.75%	-2.30%	-0.959	
2	-0.67%	-2.11%	0.162		-0.72%	-2.68%	0.377		-0.71%	-2.37%	-0.659		-0.80%	-3.10%	-1.206	
3	-0.10%	-2.21%	0.841		-0.25%	-2.93%	1.053		-0.75%	-3.12%	-0.906		-0.68%	-3.78%	0.274	
4	-0.51%	-2.72%	0.037		-0.54%	-3.47%	-0.555		0.53%	-2.59%	1.068		0.55%	-3.23%	1.014	
5	-0.53%	-3.25%	-1.571		-0.43%	-3.90%	-1.626		-0.29%	-2.88%	-0.906		-0.27%	-3.50%	-0.713	
6	-0.19%	-3.44%	-0.767		-0.24%	-4.14%	-1.626		-0.27%	-3.15%	-1.153		-0.34%	-3.84%	-2.193**	
7	0.02%	-3.42%	0.573		0.09%	-4.05%	1.053		0.19%	-2.96%	2.302**		0.18%	-3.66%	1.508	
8	-0.38%	-3.80%	0.037		-0.47%	-4.52%	-0.287		-0.36%	-3.32%	-0.906		-0.38%	-4.04%	-0.466	
9	0.02%	-3.78%	-0.499		0.00%	-4.52%	-0.287		-0.53%	-3.85%	-0.659		-0.58%	-4.62%	-0.959	
10	0.04%	-3.74%	-0.499		0.08%	-4.44%	-0.555		0.03%	-3.82%	-0.412		0.10%	-4.52%	-0.466	
11	0.48%	-3.26%	-0.231		0.58%	-3.86%	0.249		-0.69%	-4.51%	-0.659		-0.58%	-5.10%	-0.466	
12	-0.15%	-3.41%	1.109		-0.08%	-3.94%	0.785		-0.09%	-4.60%	0.575		-0.20%	-5.30%	-0.219	
13	-0.86%	-4.27%	0.037		-0.99%	-4.93%	0.249		-0.34%	-4.94%	0.575		-0.43%	-5.73%	0.521	
14	-0.43%	-4.70%	-0.767		-0.55%	-5.48%	-0.555		-0.18%	-5.12%	-0.412		-0.28%	-6.01%	-0.713	
15	-0.14%	-4.84%	-0.767		-0.16%	-5.64%	-0.823		-0.31%	-5.43%	-1.401		-0.36%	-6.37%	-1.699*	
30	0.10%	-6.33%	0.037		0.02%	-7.67%	-0.287		0.28%	-6.13%	-0.311		0.28%	-7.50%	-0.85	
	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic
-30,-2	-1.23%	-0.108	-1.99%	-0.649	-1.68%	-0.434	-2.46%	-0.434	-1.01%	-0.051	-1.54%	-0.549	-1.41%	-0.353	-1.96%	-0.602
-1,0	0.49%	0.432	0.49%	0.432	0.46%	-0.434	0.45%	-0.434	-0.07%	-0.549	-0.08%	-0.549	-0.16%	0.850	-0.17%	-0.850
+1,+30	-5.57%	-0.499	-6.22%	-1.035	-6.46%	-1.358	-7.20%	-1.358	-5.08%	-1.400	-5.71%	-1.646*	-5.95%	-1.946*	-6.63%	-1.946*

*, **, *** denotes statistical significance at the .1, .05, and .01 levels of significance.

Table 2-6: Event Study Results, Stocks Moving to Lower Tier.

This table reports the results of an event study on the three-tiered listing structure for the NASDAQ Stock Exchange, specifically focusing on firms that dropped from a higher tier to a lower tier (GSM to NGM, or NGM to NCM). The *Announcement Date* columns report the average and cumulative abnormal returns for the sample firms based on the date of the company's initial press release or SEC filing announcing the move. The *Effective Date* columns report the average and cumulative abnormal returns for the date the firms began trading on the lower tier. FF3FM represents calculations of abnormal returns using the Fama-French 3-Factor Model. FF4FM represents calculations of abnormal returns using the Fama-French 3-Factor Model, plus the Carhart Momentum Factor.

Day	Panel A: Announcement Date (n=68)						Panel B: Effective Date (n=74)					
	FF3FM			FF4FM			FF3FM			FF4FM		
	Mean Abnormal Return	Cumulative Abnormal Return	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Generalized Signed Z-statistic	Mean Abnormal Return	Cumulative Abnormal Return	Generalized Signed Z-statistic
-30	1.32%	1.32%	0.648	1.28%	1.28%	0.177	-0.42%	-0.42%	0.143	-0.47%	-0.47%	0.178
-15	-0.10%	1.25%	-0.141	-0.02%	1.89%	-0.086	1.22%	3.45%	1.129	1.06%	3.55%	1.657**
-14	-0.52%	0.73%	-0.667	-0.81%	1.08%	-0.349	-0.66%	2.79%	-0.35	-0.80%	2.75%	-0.808
-13	-0.66%	0.07%	-0.667	-0.70%	0.38%	-1.138	-1.59%	1.20%	-0.103	-1.71%	1.04%	-0.315
-12	-1.16%	-1.09%	0.385	-1.44%	-1.06%	-0.086	1.14%	2.34%	1.129	1.12%	2.16%	1.164
-11	1.18%	0.09%	0.648	1.01%	-0.05%	0.703	0.68%	3.02%	-0.596	0.73%	2.89%	-0.068
-10	1.40%	1.49%	0.122	1.55%	1.50%	0.44	-0.72%	2.30%	-0.35	-0.52%	2.37%	-0.068
-9	-1.03%	0.46%	-0.93	-0.91%	0.59%	-0.875	0.63%	2.93%	1.376*	0.66%	3.03%	0.918
-8	-0.37%	0.09%	2.225**	-0.28%	0.31%	2.282**	-0.68%	2.25%	-0.103	-0.57%	2.46%	0.425
-7	0.40%	0.49%	1.962**	0.48%	0.79%	2.019**	1.62%	3.87%	0.636	1.39%	3.85%	0.918
-6	2.18%	2.67%	1.173	2.02%	2.81%	1.23	2.33%	6.20%	0.39	2.10%	5.95%	0.178
-5	0.64%	3.31%	-0.93	0.44%	3.25%	-1.138	0.45%	6.65%	0.39	0.51%	6.46%	0.178
-4	-0.03%	3.28%	0.648	-0.02%	3.23%	0.703	0.08%	6.73%	0.39	0.02%	6.48%	0.178
-3	1.49%	4.77%	0.91	1.50%	4.73%	1.23	-0.82%	5.91%	0.636	-0.79%	5.69%	0.918
-2	-0.60%	4.17%	-0.667	-0.55%	4.18%	-0.086	0.33%	6.24%	1.376*	0.30%	5.99%	1.411*
-1	0.74%	4.91%	0.385	0.63%	4.81%	0.703	0.41%	6.65%	0.636	0.52%	6.51%	0.178
0	1.12%	4.91%	1.436*	1.30%	4.91%	1.493*	0.04%	4.91%	-0.103	0.12%	4.91%	-0.068
1	0.11%	5.02%	-0.141	0.12%	5.03%	-0.086	0.30%	5.21%	0.39	0.34%	5.25%	0.918
2	-0.11%	4.91%	-0.93	-0.20%	4.83%	-0.612	0.58%	5.79%	0.636	0.45%	5.70%	0.671
3	0.63%	5.54%	1.699**	0.54%	5.37%	2.019**	0.91%	6.70%	-0.103	0.97%	6.67%	0.178
4	0.47%	6.01%	0.385	0.72%	6.09%	0.967	0.91%	7.61%	0.636	1.01%	7.68%	0.918
5	1.94%	7.95%	2.225**	1.99%	8.08%	1.756**	2.34%	9.95%	3.594***	2.51%	10.19%	3.383***
6	0.75%	8.70%	0.91	0.90%	8.98%	1.23	0.24%	10.19%	0.636	0.11%	10.30%	0.425
7	-0.68%	8.02%	0.385	-0.78%	8.20%	0.703	2.22%	12.41%	1.869**	2.24%	12.54%	1.904**
8	2.92%	10.94%	1.699**	2.98%	11.18%	2.019**	1.04%	13.45%	1.622*	1.21%	13.75%	2.150**
9	0.13%	11.07%	0.385	0.17%	11.35%	1.23	0.13%	13.58%	-0.35	0.13%	13.88%	-1.054
10	-1.28%	9.79%	-0.141	-1.25%	10.10%	-0.612	-0.20%	13.38%	-0.103	-0.27%	13.61%	0.178
11	-0.48%	9.31%	0.385	-0.63%	9.47%	0.177	-2.16%	11.22%	-0.103	-2.28%	11.33%	-0.068
12	2.29%	11.60%	0.648	2.15%	11.62%	0.967	0.80%	12.02%	-0.103	0.93%	12.26%	-0.315
13	-1.13%	10.47%	-0.93	-1.22%	10.40%	-0.612	-0.83%	11.19%	-0.234	-0.86%	11.40%	0.297
14	0.54%	11.01%	1.044	0.63%	11.03%	0.835	0.66%	11.85%	0.014	0.59%	11.99%	0.297
15	0.08%	11.09%	1.044	0.01%	11.04%	0.835	-1.06%	10.79%	0.759	-1.04%	10.95%	1.042
30	-0.06%	18.42%	0.78	0.03%	19.15%	0.834	-0.65%	16.67%	0.889	-0.57%	17.33%	1.181
	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic	Cumulative Abnormal Return	Generalized Signed Z-statistic	Compound Abnormal Return	Generalized Signed Z-statistic
-30,-2	4.17%	1.436*	0.55%	0.648	4.17%	1.493*	0.57%	0.967	6.23%	2.362***	2.98%	0.883	6.01%	1.532*	2.72%	0.918
-1,0	1.86%	1.173	1.98%	1.173	1.93%	1.23	2.05%	1.23	0.45%	1.376*	0.45%	0.883	0.64%	0.622	0.64%	0.918
+1,+30	13.26%	2.488***	11.58%	1.699**	13.94%	2.808***	12.36%	1.756**	11.75%	2.854***	9.54%	0.636	12.34%	3.095***	10.20%	0.425

Table 2-7: Descriptive Statistics, 2004-2008 IPO Market.

Pre-Reorg			Post-Reorg	
29.2%	135	NYSE	111	32.6%
2.8%	13	AMEX	17	5.0%
67.7%	313	NASDAQ	205	60.1%
0.2%	1	NYSE Arca	8	2.3%
	462		341	

Table 2-8: Correlations.

	NASDAQ IPO	Ln(MktCap)	NASDAQ Industry Share	$\sigma_{Returns}$
NASDAQ IPO	1			
Ln(MktCap)	-0.35363 <.0001***	1		
NASDAQ Industry Share	0.42247 <.0001***	-0.18078 <.0001***	1	
$\sigma_{Returns}$	0.2321 <.0001***	-0.1199 0.0007***	0.32516 <.0001***	1
Post Reorg	-0.07884 0.0255**	0.06932 0.0496**	0.11691 0.0011***	0.16855 <.0001***
*, **, *** denotes statistical significance at the .1, .05, and .01 levels of significance.				

Table 2-9: Probit and Logit Estimations, IPO Market.

Dependent variable: *NASDAQ* is a dummy variable equal to 1 if the IPO listed on NASDAQ, and equal to 0 otherwise.

Independent variables: *Ln(MktCap)* is the natural logarithm of the firm's market capitalization, defined as the number of publicly traded shares times share price. NASDAQ Industry Share is the proportion of industry peers listed on NASDAQ. Standard Deviation of Returns ($s_{returns}$) is the standard deviation of the market closing price for the first 100 days of trading immediately after the firm's IPO. *Post Reorg* is a dummy variable equaling 1 if the IPO listed on NYSE, NASDAQ, or AMEX between July 3, 2006 and 31 December, 2008.

Independent Variables	**Probit**			**Logit**		
	1	2	3	4	5	6
α	-0.8072	-0.7958	11.9264	-14.2994	-14.0626	21.143
Wald c^2	54.57***	52.02***	58.25***	53.5363***	50.7312***	51.3072***
p-value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
Ln(MktCap)	-0.4366	-0.4267	-0.6275	-0.7771	-0.7584	-1.1136
Wald c2	64.1202***	60.13***	63.83***	62.4956***	58.3535***	56.4259***
p-value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
NASDAQ Industry Share	1.7067	1.8200	1.8177	2.8699	3.0458	3.0216
Wald c^2	84.4871***	91.64***	89.98***	77.2396***	83.061***	80.6329***
p-value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
$s_{Returns}$	3.3866	4.5624	4.6886	7.9698	9.7142	9.3679
Wald c^2	5.1942**	8.81***	9.11***	8.1631***	11.6969***	10.923***
p-value	0.0227	0.0030	0.0025	0.0043	0.0006	0.0009
Ln(MktCap)*Post Reorg			0.4269			0.7429
Wald c^2			14.79***			13.5003***
p-value			0.0001			0.0002
Post Reorg		-0.4522	-8.9051		-0.7219	-15.4656
Wald c^2		17.97***	16.36***		15.4855***	14.7996***
p-value		<.0001	<.0001		<.0001	0.0001
n	803	803	803	803	803	803
Log Likelihood	409.765***	400.646***	393.199***			
Likelihood Ratio				231.678***	247.585***	261.309***
Score				207.586***	218.909***	227.098***
Wald				162.035***	167.377***	171.417***
Psuedo r^2	0.258	0.272	0.281	0.258	0.272	0.281

, **, ** denotes statistical significance at the .1, .05, and .01 level.

Figure 2-1: Optimal Listing Standards (With Lower Tier).

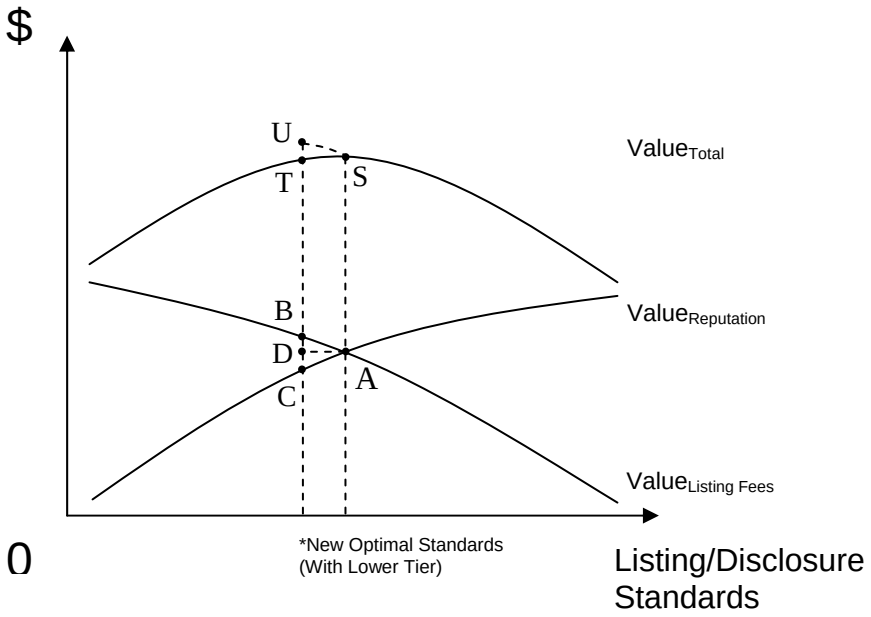


Figure 2-2: Optimal Listing Standards (With Higher Tier).

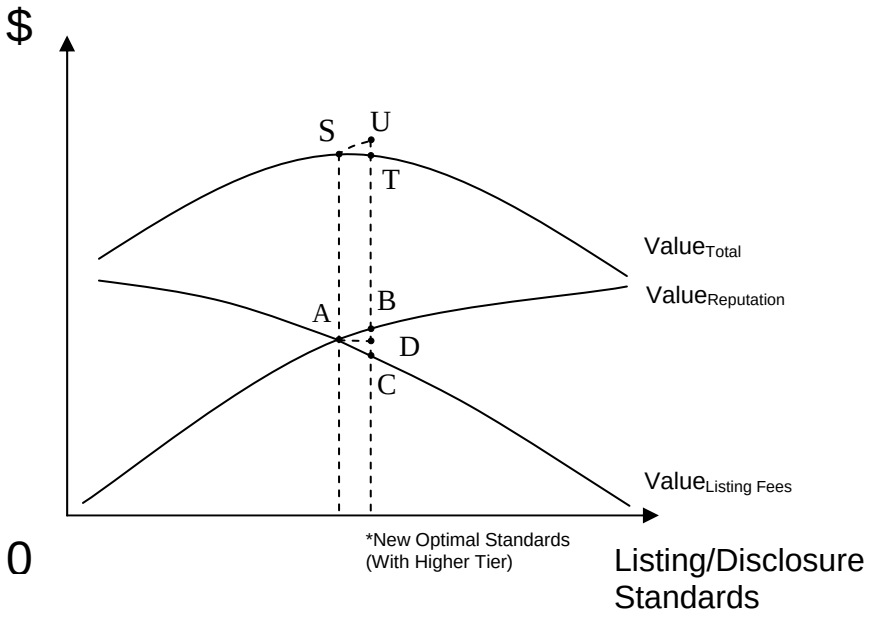


Figure 2-3: GSM, Post-Announcement Window.

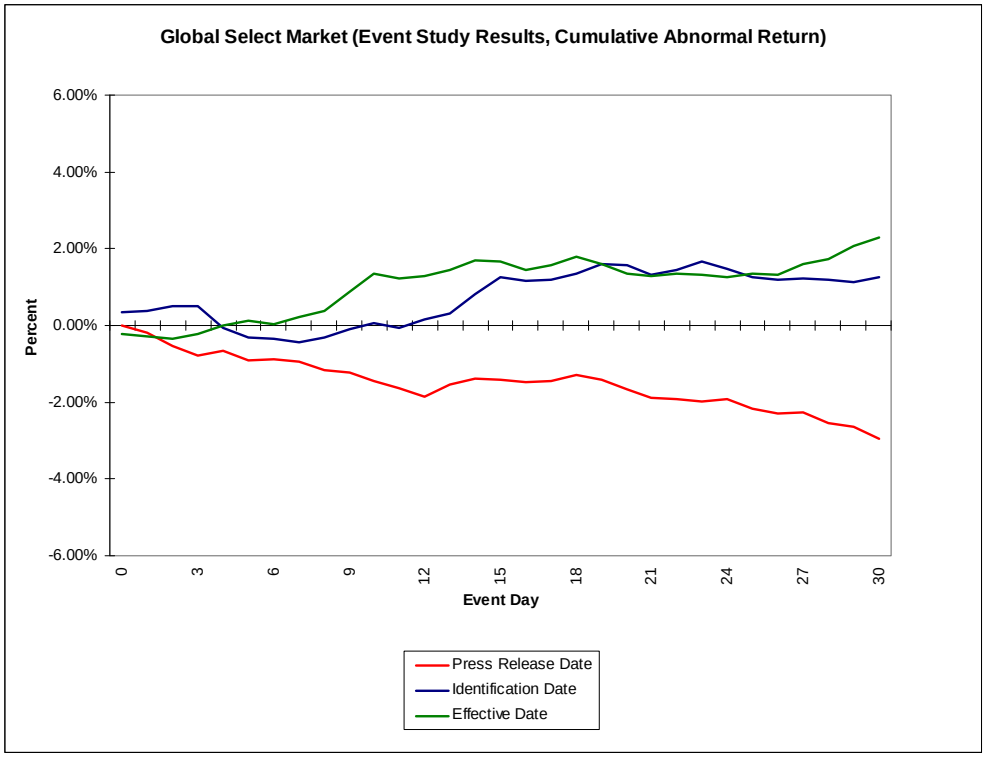


Figure 2-4: GSM, Full 61-Day Event Window.

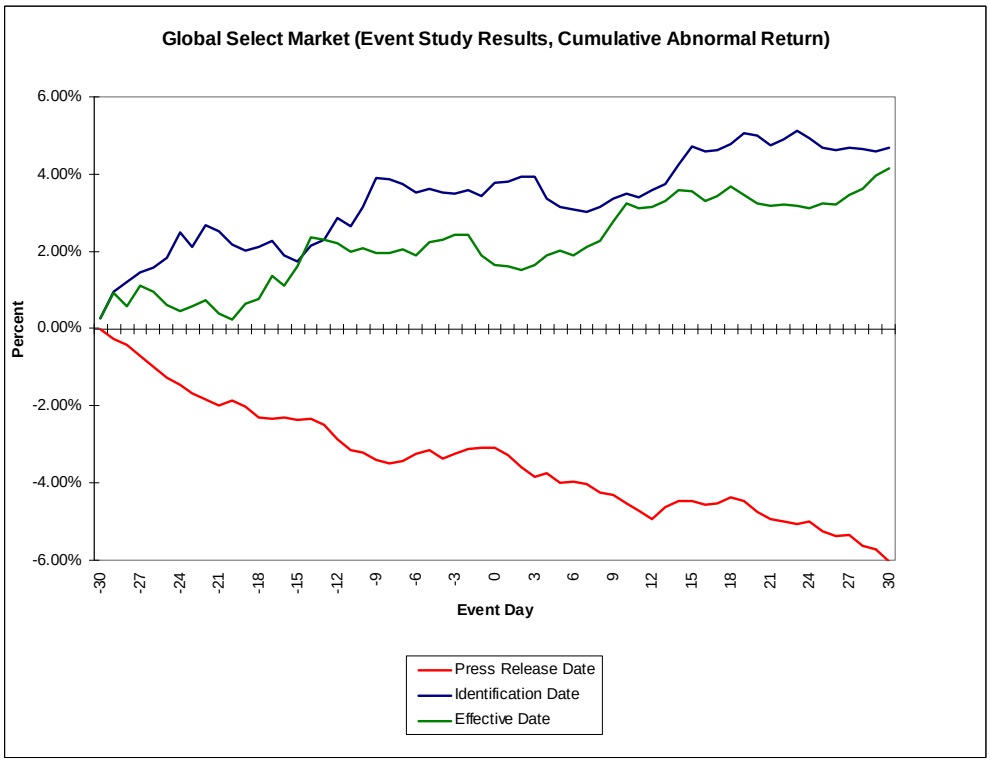


Figure 2-5: NGM, Post-Announcement Window.

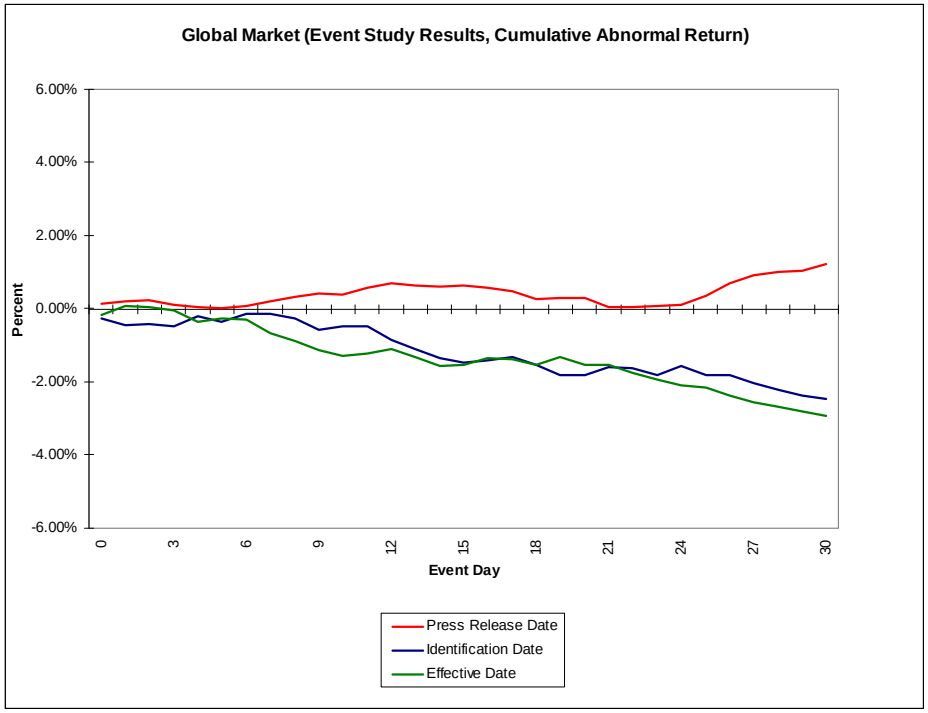


Figure 2-6: NGM, Full 61-Day Event Window.

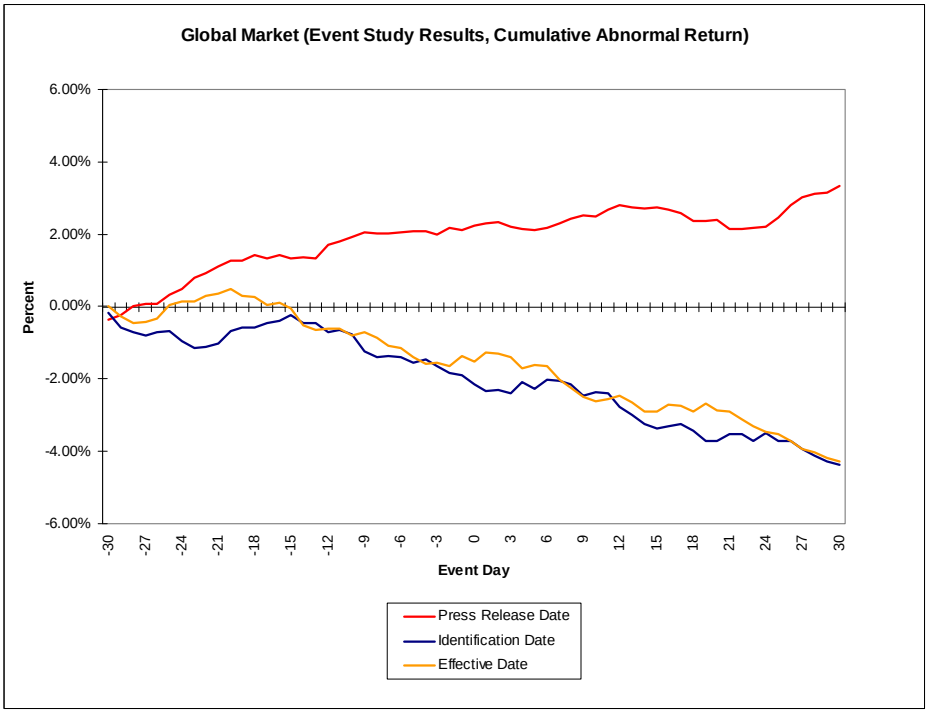


Figure 2-7: GSM vs. NGM, Full 61-Day Event Window.

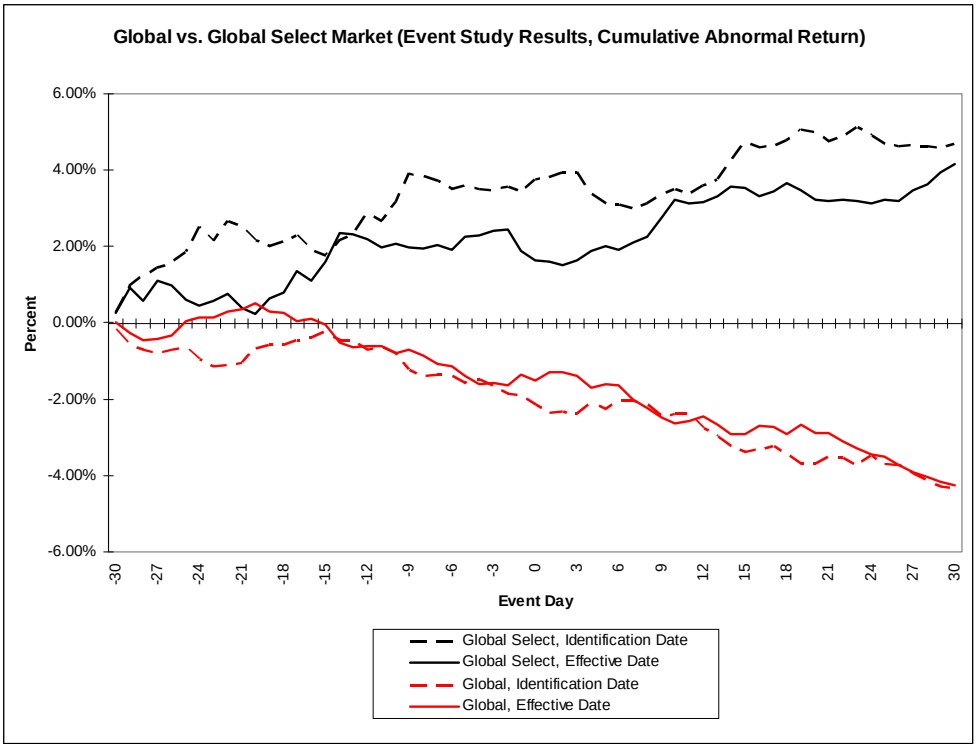
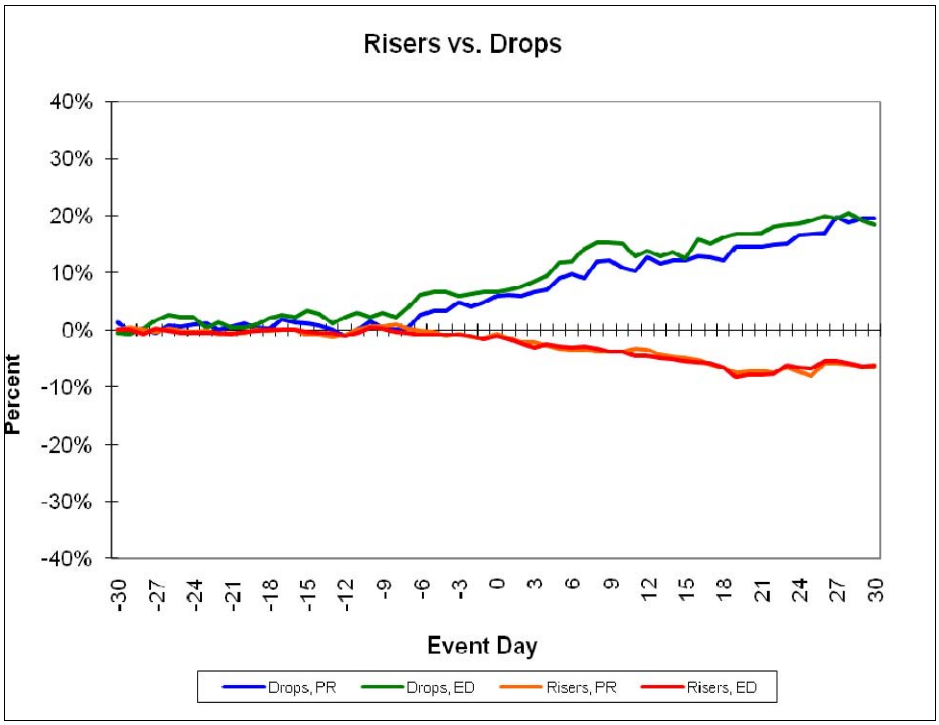


Figure 2-8: Risers vs. Drops, Full 61-Day Event Window.



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APPENDICES

APPENDIX A

Requirements		Global Select			Global			Capital
		1	2	3	1	2	3	
Financial Requirements	Pre-tax earnings	Aggregate in prior three fiscal years > $11M & Two most recent fiscal years > $2.2M & Each of the prior 3 fiscal years > $0	n/a	n/a	$1M	n/a	n/a	$.75M[1] (Net income)
	Cash flows	n/a	Aggregate in prior 3 fiscal years > $27.5M & Each of the prior 3 fiscal years > $0	n/a	n/a	n/a	n/a	n/a
	Market capitalization	n/a	Average > $550M over prior 12 months	Average > $850M over prior 12 months	n/a	n/a	n/a	$50M[1]
	Revenue	n/a	Previous fiscal year > $110M	Previous fiscal year > $90M	n/a	n/a	n/a	n/a
	Minimum bid price		$5.00			$5.00		$4.00
	Minimum market makers		3		3	3	4	3
	Stockholders' Equity		n/a		$15M	$30M	n/a	$5M[1]
	Operating history		n/a		n/a	2 years	n/a	n/a
	Corporate governance		Yes			Yes		Yes
Liquidity Requirements	Beneficial shareholders or Beneficial shareholders and Avg mo vol over past 12 mos		2,200 or			400 (round lot holders)		300 (round lot holders)
	Publicly held shares		1.25M			1.1M		1M
	Market value of public shares or Market value of public shares and Shareholders' equity		$110 million or $100 million and $110 million		$8M	$18M	$20M	n/a
	Market value of listed securities or Total assets and Total revenue		n/a		n/a	n/a	$75M or $75M and $75M	n/a

1 - Denotes Capital Market companies must meet one of these three criteria.

Initial Listing Standards

APPENDIX B

	GSM		GM		CM		
	Standard 1	Standard 2	Standard 1	Standard 2	Standard 1	Standard 2	Standard 3
Stockholders' equity	$10,000,000	N/A	$10,000,000	N/A	$2,500,000	N/A	N/A
Market value of listed securities or Total assets and total revenue	N/A	$50,000,000 or $50m and $50m	N/A	$50,000,000 or $50m and $50m	N/A	$35,000,000 N/A	N/A $500,000
Publicly held shares	750,000	1,100,000	750,000	1,100,000	500,000	500,000	500,000
Market value of publicly held shares	$5,000,000	$15,000,000	$5,000,000	$15,000,000	$1,000,000	$1,000,000	$1,000,000
Bid price	$1	$1	$1	$1	$1	$1	$1
Shareholders (round lot holders)	400	400	400	400	300	300	300
Market makers	2	4	2	4	2	2	2
Corporate governance	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Continued Listing Standards

VITA

Kevin Broom was born and raised in Shreveport, Louisiana. After receiving his Bachelor of General Studies from Louisiana State University in Shreveport in 1992, he earned a commission as a Second Lieutenant in the United States Army Medical Department. After serving six years in the Army's rapid deployment forces, to include serving as a Company Commander in the 101st Airborne Division (Air Assault), he earned an opportunity to attend the Defense Comptroller Program at Syracuse University where he earned a Master of Business Administration in 2000. After a one-year internship, and a two-year assignment as a Chief Financial Officer for an Army hospital, the Army selected him to attend a fully funded Ph.D. program in a business discipline. Subsequently, he took advantage of this academic opportunity by coming to the University of Mississippi in order to pursue a Ph.D. in Business Administration - Finance. Currently, he continues to serve in the Army Medical Department as a Lieutenant Colonel, teaching graduate-level finance. He is married to Polly Anne Morse and has five children, Alexander, Jackson, Amanda, Jonah, and Lydia.