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William C. Johnson

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Geoffrey Booth
Major Professor's Signature

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THREE ESSAYS ON INITIAL PUBLIC OFFERINGS AND MARKET INFORMATION

By

William C. Johnson

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ABSTRACT

THREE ESSAYS ON INITIAL PUBLIC OFFERINGS AND MARKET INFORMATION

By

William C. Johnson

This dissertation examines market information and how different types of information impact initial public offerings. The first essay examines a group of IPO underwriters that also manage institutional funds from 1993 through 1998. We find that there is a statistical difference between the average fund holdings (1.24% of shares outstanding) of IPOs for institutions that underwrite a particular IPO and the fund holdings (0.92%) of institutions that do not underwrite the same IPO. We provide evidence that underwriters use their institutional funds as vehicles to help them earn more equity underwriting business. We also show that IPO underwriters use their superior information to earn annualized excess returns 7.6% above non-underwriters, benefiting their institutional investors. In the second essay we study the discretionary disclosure of IPO firm earnings in unofficial press releases during the first 25 days of trading, the quiet period. This information release is unique in that the market has no priors concerning management earnings release so management has full discretion over the release of this information. Not surprisingly, the probability of releasing earnings during the quiet period is positively related to the abnormal operating performance of the firm. The probability of earnings release is also related to the volatility in the overall market implying that managers are

timing their earnings releases. We find that firms are able to attract greater analyst coverage, particularly from unaffiliated analysts when they release earnings earlier ie., during the quiet period. In the third essay We examine the relationship between firm news and volatility over time. Contrary to the negative relationship between idiosyncratic news and firm volatility predicted by current theories, we document a positive relationship between firm level news and firm level volatility. We confirm, as conjectured in prior literature, an increase in idiosyncratic IPO volatility over the period from 1973 through 2003. We find the increase in volatility is over twice as large for IPOs as for firms matched to the IPOs based on size and book-to-market ratio. We also develop a comprehensive database consisting of 129,737 observations of news disclosures by recent IPO and matching firms, and we use the database to document the distribution of news day returns. Keeping the media sources of news constant, we find that the number of news citations per firm has risen sharply over the last three decades, and the stock price reaction to news has become significantly larger. Our final contribution presents evidence that the increased idiosyncratic volatility for both IPOs and matching firms is significantly related to an increase in news in recent decades. In fact, an increase of just one extra news day per month adds 0.6% to the monthly standard deviation for IPOs, or 2.1% per year.

To my loving and supportive wife.

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1.1 Introduction

In recent years, researchers have produced a great deal of work analyzing conflicts of interest within universal banks and other financial institutions. With the increase in universal banking in the United States since the 1999 Gramm-Leach-Bliley Act, the potential for conflicts of interest within a financial institution has certainly increased. However, little research has been conducted concerning the conflict of two particular activities within the same institution: asset management and securities underwriting. The current paper investigates the stock holdings of financial institutions with underwriting divisions. In particular, we are interested in determining if fund investors suffer or benefit from institutions with both asset management and underwriting divisions.

There is anecdotal evidence in the press that asset management divisions of investment banks may feel pressure to hold recent IPOs brought forward by the same bank's underwriting division. A March 12, 2003 article in the *Wall Street Journal* describes such an event at Deutsche Bank. An underwriting executive at Deutsche phoned the chief investment officer at Deutsche's asset management unit and asked him to buy some of the struggling media company Vivendi Universal which Deutsche had helped bring public. The chief investment officer was told to "be a team player." Evidently a shouting match broke out between the two of them when the request was refused.

The SEC has expressed concern about this issue as well. A copy of a speech by SEC Director Stephen M. Cutler on September 9, 2003 says that "…an asset manager might feel pressured to invest in companies that its investment banking affiliate had underwritten. But certainly a firm's advisory clients would be interested – not to mention, troubled – to learn that their portfolios were viewed by some as a tool for attracting investment banking business to the firm."

The literature in the area of universal banking focuses on two main conflicts of interest: bank lending/underwriting conflicts and sell side analysis/underwriting conflicts. For instance, Puri (1996, 1999) shows that bank lenders/underwriters can be effective in certifying underwritten securities, implying that the universal bank adds value to the underwriting process. Michaely and Womack (1999) provide evidence that sell side analysts working for the underwriter of an IPO give biased recommendations compared to non-underwriter analysts. In the context of SEO issues, Dugar and Nathan (1995) and Lin and McNichols (1998) find that analysts employed by SEO underwriters release more favorable earnings forecasts and stock recommendations than non-affiliated analysts. Ljungqvist, Marston, and Wilhelm (2005) find that analyst initiations by investment bank affiliated analysts have no relationship with whether or not the investment bank will win future underwriting jobs. Agrawal and Chen (2004) study stock recommendations and forecasts made by analysts at brokerages, investment banks, and combination brokerage/investment banks. Their results are consistent with brokerages providing more frequent and less accurate forecasts, possibly to increase the number of transactions by their stock clients.

Only Ber, Yafeh, and Yosha (2001) explicitly consider the dynamic relationship between stock underwriting and fund management over time. However, their paper focuses on the Israeli markets which could be quite different from the U.S. securities markets. They find that institutional portfolios show poor one-year post IPO stock performance when their asset management division buys IPOs brought public by their own underwriting unit. For a static look at fund holdings, Ritter and Zhang (2005) use the first quarter institutional holdings in IPOs as a proxy for the amount of shares institutions self-allocate at the time the IPO goes public. Their focus is on what drives institutions to allocate shares from the initial offering to their asset management division.

Our paper is unique in that it is the first paper examining U.S. markets to take a dynamic look at the potential benefits and conflicts of interest inherent in an institution with both underwriting and asset management divisions. In contrast to Ber, Yafeh, and Yosha (2001), our paper shows that there are some benefits to utilizing asset managers who also have underwriting divisions. We find evidence that underwriter/asset managers utilize their underwriting relationship to benefit institutional investors. However, we also provide evidence that underwriters use their assets under management to gain future underwriting business.

Our focal point is a group of IPO underwriters that also manage institutional funds from 1993 through 1998. We consider only institutions that both underwrite stocks and have asset management divisions. For each IPO, we refer to "underwriters" as those investment bank/asset managers that underwrite the IPO and hold shares in a given quarter. We refer to "non-underwriters" as those investment bank/asset managers that did not underwrite the given IPO, but do hold shares in the given quarter. Underwriter purchases of their own IPOs occur frequently. Over 50% of the IPOs in our sample are purchased in underwriter institutional funds. Also, 68 of the 141 investment banks we analyze purchase stock in their own IPOs.

We test two hypotheses. The first we refer to as the Quid Pro Quo Hypothesis. This states that underwriters will utilize their institutional funds as a vehicle to earn more underwriting business. The second hypothesis is the Superior Information Hypothesis. Here we test whether underwriters use the information they discover during the IPO underwriting process to earn superior future returns in their managed funds.

We first document that there is a statistical difference between the stock holdings (1.2% of shares outstanding) of IPOs for institutions that underwrite a particular IPO and the stock holdings (0.9%) of institutions that do not underwrite the same IPO, averaging holdings across the first eight quarters after the IPO. Consistent with Wermers (1999), we find that non-underwriter institutional holders are on average momentum traders in that they purchase stocks after they have gone up by 3.4% in the previous quarter. In contrast, underwriters are not momentum traders; underwriters purchase their own IPOs after a statistically insignificant previous quarterly return of 0.9%. This difference in trading behavior is consistent with the Quid Pro Quo Hypothesis.

For each of our IPO firms, we also document the trading patterns for underwriters and non-underwriters in the quarters surrounding subsequent SEOs and in-house analyst coverage initiations. Underwriters sell their holdings in quarters after they have initiated analyst coverage or have underwritten the firm's secondary offering. Non-underwriters do not sell after these events. These results show that underwriters could be trading for reasons other than to maximize institutional investor returns, also consistent with our first hypothesis.

We next document that the stock purchases of non-underwriters earn a future stock return that is not statistically different from zero, but large purchases by underwriters provide a statistically significant excess return of 1.9% over the subsequent quarter or 7.7% per year. This finding implies that underwriters utilize superior information gleaned from the underwriting relationship with the firm to make decisions about the stocks they purchase.

If underwriters learn superior information about the firm during the IPO, we do not expect that the underwriter will be able to leverage that information under all conditions. We find that the superior future returns by underwriters are dependent on the information environment for the IPO and the underwriter reputation rank. We classify firms as to whether they have analyst coverage or not. When firms have no analyst coverage, underwriters earn statistically significant future quarterly returns of 1.8%. If firms do have analyst coverage, underwriters are not able to earn superior future returns. We also find that high rank underwriters earn significant quarterly returns of 2.3%, where low rank underwriter returns are not significantly different from zero.

We show that IPO underwriters are able to exploit their superior information; SEO underwriters do not earn statistically significant future returns. We confirm the positive future abnormal returns for underwriters in both cross-sectional regressions and through calculating buy-and-hold abnormal returns based on a size and industry matching firm technique.

The remainder of the paper is organized as follows. Section I discusses the theoretical motivation for the paper and proposes hypotheses to test. Section II describes our underwriter and institutional holdings sample. In section III we examine IPO holdings of institutional fund managers and test our motivating hypotheses. In the paper's last section, we offer implications of our findings and conclusions.

1.2 Motivation for Institutional Purchases of IPOs

We characterize the actions taken by the asset management division of an investment banking firm as value decreasing or value increasing activities. Value decreasing activities generally take the form of a conflict of interest between the asset manager's fiduciary responsibilities to their institutional investors and the incentive to purchase stocks that the institution has underwritten. If an institutional asset manager has sufficient liquid assets, perhaps he can stabilize stock prices by making a series of large stock purchases using the assets of the institutional fund. It is also possible that the institutional trader may hold the stock as a quid pro quo for the firm that went public. The underwriter/institutional trader might simply hold the stock to send a signal to the IPO firm that the underwriter is attempting to market the security. In the extreme form, value decreasing activities would include "stuffing," where underwriters of poor quality securities are disproportionately purchasing and holding these low quality stocks in their own asset management division. This motivates our first hypothesis.

1.2.1 <u>Hypothesis I Quid Pro Quo</u>: Underwriter/asset managers will utilize their institutional funds as a vehicle to attract more underwriting business from the newly public firms.

The empirical implications of Hypothesis I are as follows. On average, underwriters will purchase more of their own poorly performing IPOs than non-underwriters will. We know from Wermers (1999) that on average, institutional traders are momentum traders. Hypothesis I predicts that underwriters will trade less on momentum than non-underwriters.

Hypothesis I also predicts certain changes in portfolio holdings around the time of secondary stock offerings and analyst initiations. If investment bank asset management divisions hold stocks that their firm has underwritten in an effort to attract or keep their business as the SEO underwriter, we would expect to see the IPO underwriters hold large blocks of stock before the SEO. At the same time, the underwriter is likely to liquidate the stock position after the SEO once the firm has chosen the underwriter for its secondary offering. In the Quid Pro Quo Hypothesis, we view in-house analyst recommendations as possible substitutes for purchases by the asset management division. Quid Pro Quo predicts that the underwriter might hold the stock until its in-house analyst makes a recommendation, and then liquidate its position.[1]

Value increasing activities generally involve utilization of superior information obtained as the underwriter for a firm. We know that institutional investors have the

[1] We examine quid pro quo activities within an investment bank, but Hoberg and Seyhun (2005) examine another type of quid pro quo activity that involves investment banks. They find evidence that lead IPO underwriters and venture capitalists collaborate. Venture capitalists tolerate higher underpricing to benefit the IPO underwriters, and IPO underwriters provide positive price support prior to the expiration of lock-up periods. Many venture capitalists sell their holdings as soon as the lock-up provisions expire.

ability to utilize superior information to earn abnormal returns [see Ben Dor (2003), Field and Lowry (2004), and Krigman, Shaw, and Womack (1999)]. The underwriter, through the process of taking a firm public and through its own due diligence will have access to more information than the general public and possibly more than other institutional investors. Although the asset management division and the underwriting division are separate entities, it seems possible, if not likely, that they would share information about firms.[2] The underwriter is in a good position to provide this superior information to the asset management division of the institution. Also, many underwriter analysts provide firm coverage for the IPO. It is not unreasonable to expect the information gleaned by the analyst or the underwriting division to be utilized by the institutional investing arm of the underwriter. Such trading on information should result in higher future returns for the underwriters.

1.2.2 <u>*Hypothesis II Superior Information*</u>*: Underwriter/asset managers will purchase stocks that have superior future return prospects to benefit their institutional investors*

Whereas the Quid Pro Quo Hypothesis can be tested by looking at past returns, the Superior Information Hypothesis can be tested by looking at future returns. If

[2] It is fairly common for the asset management division of a firm and the underwriting division for the same firm to be in different buildings. This type of physical separation would help to reduce the amount of interaction between the underwriting division and the asset management division. However, one major investment bank executive we interviewed stated that employees often move across divisions within an investment bank and such movement would invariably result in personal contacts existing across divisions, even without the firm explicitly encouraging these relationships. It is possible that these relationships serve as one mechanism to allow the sharing of information from the underwriting to the asset management divisions.

subsequent to all stock purchases, the stock value increases, then the underwriter is said to be trading on superior information.

What might motivate the underwriting division and the asset management division to interact? The asset management branch of the institution is likely to be compensated largely as a function of assets under management. The literature has generally shown that there is a positive correlation between past returns and future fund flows for institutional funds. As such, it is generally not in the asset management's best interest to hold stocks that are expected to perform poorly. The asset management division is likely to be receptive to the Superior Information sharing discussed in Hypothesis II, but is not likely to favor the Quid Pro Quo theory of Hypothesis I.

In contrast, the underwriting division is compensated for the number of security issuances the institution performs in the form of IPOs, SEOs, and other investment banking activities. Underwriters that take firms public successfully (i.e., with higher future stock returns) are more likely to attract new clients. Thus, the underwriting division would likely be in favor of the activities implied in Hypothesis I. The underwriter could be indifferent between providing information to the asset management division of the institution as in Hypothesis II.

We see that the two institutional branches are motivated to engage in different activities: Quid pro quo for the underwriter and information sharing for the asset manager. In equilibrium it is possible that the underwriter will share information with the asset manager in exchange for the asset manager doing some degree of price stabilization or quid pro quo holdings of recent IPOs.

We should note that fund managers are prohibited by SEC rules from buying securities to benefit anyone but fund investors. In fact, until 1997, fund managers were limited to purchases of 4% or less of shares outstanding in stock deals where the banking affiliate participated. Under Wall Street pressure, the SEC increased this ruling to 25% of shares outstanding after 1997.[3]

1.3 Data and Institutional IPO Holdings

Our data source for IPOs from 1993 through 1998 is the Securities Data Company (SDC) new issues database. We examine IPOs prior to the internet/bubble period to avoid the influence of this period in our data sample.[4] Since 1978 the SEC has required institutional fund managers with discretionary holdings of more than 10,000 shares or $200,000 to report their holdings on a quarterly basis.[5] By institution name, we merge the IPO information from SDC to the Thompson Financial database of 13f filings for institutional holdings. We consider only underwriters that are listed in the SDC database as lead underwriters.

We include quarterly holdings of IPOs for the first eight quarters the firm is publicly traded.[6] We examine only the first eight quarters because we think it is unlikely that underwriters would be able to leverage their superior information over the market for

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[3] SEC Release IC-22775.

[4] Loughran and Ritter (2004) document a regime shift in several important control variables for our sample moving from 1993-1998 to post-1998 data.

[5] Similar to Field and Lowry (2005) we find that a large percentage of our data involves holdings below 10,000 shares and $200,000. We find that 11,901 data points or 25% of our dataset is below the threshold of 10,000 shares or $200,000.

[6] Quarter 1 holdings is the first quarter end from the date of the IPO. A firm that goes through its IPO on September 29, 1996 will have quarterly holdings recorded on September 30, 1996. A firm that goes through its IPO on July 1, 1996 will also have its first quarterly holdings listed on September 30, 1996.

longer than two years. However, we do feel that quid pro quo activities may occur for more than eight quarters. In an effort to balance tests between these two hypotheses, we settle on an eight quarter horizon. We wish to look at analyst coverage and subsequent SEO activity as well, which precludes us from just looking at one or two quarters after the IPO.

The quarterly holdings from Thompson are already aggregated across all fund holdings within an institution. Our screening criteria yield a sample of 6,441 observations where IPO underwriters hold their own IPO in their managed funds, and 28,233 observations where institutional holders underwrite securities, but do not underwrite the specific IPO they hold. There are a total of 2,412 distinct IPOs.

To control for analyst coverage by the institutional investors, we utilize Thomson Financial's I/B/E/S database to obtain sell side analyst coverage of IPOs from 1993-2000. We merge this database into our holdings database based on the institution names. We use information about which firm the initiating analyst works for as well as how many quarters after the IPO the analyst initiates coverage of the IPO.

Since we are interested in controlling for SEO underwriting relationships, we use the Securities Data Company (SDC) secondary issues database as well. Once again, we merge the information about when a stock goes through its secondary offering and who the underwriter is into the original IPO and institutional holdings data. Finally, stock return information comes from CRSP.

The format of the holdings data can be seen in Panel A of Table 1.1. This table contains the institutional holdings of Office Max for the first six calendar quarters from the November 2, 1994 IPO date. We examine institutional holders that underwrite Office

Max's IPO, as well as institutional holders who do underwrite IPOs, but were not part of the underwriting syndicate for Office Max. Quarter one holdings are for the first calendar quarter end after the IPO date, in this case, December 31, 1994. There are institutions that hold stock in the firm for as little as one quarter (HSBC Asset Management holds 41,850 shares in quarter five) or as many as six quarters (William Blair & Company).

In Table 1.1 Panel B, we report the analyst coverage information for Office Max. There are two analysts in our dataset that initiate coverage of Office Max during the first eight quarters it publicly trades and hold stock sometime during that window. Morgan Stanley Group Inc, an underwriter for the stock, initiates coverage in quarter two. Bear Stearns & Co, a non-underwriter, also initiates coverage in quarter two. Finally, the secondary stock offering information for the company is contained in Table 1.1 Panel C. This table shows that the firm undergoes a secondary stock offering in quarter three and all three IPO underwriters are also SEO underwriters.

In Table 1.2 Panel A, we report the characteristics of IPO holdings for both underwriters and non-underwriters. This table shows that underwriters hold slightly smaller firms with an average market capitalization of $1,020 million versus $1,230 million for non-underwriters. Underwriters hold IPOs with lower monthly turnover than non-underwriters. We define monthly turnover as the total monthly volume for a given IPO divided by its shares outstanding at the end of the same month. The IPOs that underwriters hold are less likely to be venture capital-backed than are the non-underwriter holdings. We use the investment bank reputation rankings from Loughran and Ritter (2004) available on Jay Ritter's website, bear.cba.ufl.edu/ritter/index.html, and average them across the firm's holdings in the same year. Firms who purchase their own IPOs have a higher ranking (8.4) than non-underwriter purchases (7.1). All differences between underwriters and non-underwriters are significant at the 1% level.

Underwriters frequently buy their own IPOs. In Table 1.2 Panel B, we report that underwriters purchase stock in 52% of the 2,412 IPOs that came public between 1993 and 1998. About one-fourth of the IPO sample goes through an SEO within the first eight quarters after the IPO, and over 40% of IPOs have analyst coverage initiated by their underwriter within eight quarters of the IPO. Also, the number of IPOs purchased by underwriters is not driven by just a few underwriting/asset management firms. Of the 141 firms who both underwrite and manage assets, 68 of them purchase their own IPOs.

We now turn to institutional holdings of IPOs averaged across the first eight quarters of trading, reported in Table 1.3 Panel A. From 1993-1998, average holdings of IPOs for all non-underwriter funds are 0.92% of total shares outstanding. The average underwriter holdings are 1.24% of total shares outstanding, for a statistically significant difference (p-value of 0.00) of 0.32% between the two groups.[7] The table also summarizes the average IPO holdings over the early and late 1990s. Underwriter holdings have increased from 1.19% in the 1993-1995 time period to 1.30% from 1996-1998. Non-underwriter holdings have dropped from 0.94% to 0.90% over the same time period.

Table 1.3 Panel B reports the percentage of shares held grouped by quarters. Underwriters hold more shares than non-underwriters across all quarter groupings. There

[7] The share holdings of non-underwriters average 137,200 shares with a market value of $3.3 million. The share holdings of underwriters average of 245,600 shares with a market value of $6.2 million.

is a decrease in the percentage of holdings across quarters for both underwriters and non-underwriters as time passes from the IPO. Underwriter holdings drop from 1.33% in quarters one through four to 1.11% in quarters five through eight. Non-underwriter holdings have a similar decline. Figure 1.1 shows the general trend of institutional holdings for underwriter and non-underwriters every quarter for the first eight quarters

1.4 **IPO Holdings and Performance**

1.4.1 Testing The Quid Pro Quo Hypothesis

We now move to testing Hypothesis I: Quid Pro Quo. The prior literature documents that institutional holders often follow a short-term momentum strategy (Wermers 1999). But if underwriters are trying to stabilize prices or gain more underwriting business from IPO firms, they may purchase shares in IPOs that are recent poor performers.

For each IPO, we form quarterly returns less the CRSP equally weighted index before and after the 13f quarterly filing dates. We do not calculate a return for what we call quarter zero, however, as each IPO will have a different period of time from the IPO date to the required first filing.[8] We also classify the institutional holder as a buyer if the net change in shares from the previous quarter is positive for a given IPO. Out of 34,674 total observations, 75% show an increase in holdings over the previous quarter. The 13f filings report shares held on the last day of the quarter, but we have no way of knowing whether those shares were purchased at the beginning, middle, or end of the quarter.

[8] A firm that goes through its IPO on September 29, 1996 will only have one day of returns in quarter zero. In contrast, a firm that goes through its IPO on July 1, 1996 will have nearly a full quarter of returns.

Examining prior returns (quarter t -1) of stocks purchased in the future (quarter t) avoids timing ambiguity in that purchases made in quarter t are clearly occurring after prior returns. However, it is possible that institutional traders only consider stock price movements over the short term (less than one quarter) in their purchase decisions. We would not be able to detect any relationship between firm stock purchases and past stock returns in this case. By also examining contemporaneous returns and purchases for quarter t, we make our analysis timelier, but it is not possible to disentangle cause and effect. We choose to report both contemporaneous (quarter t) and prior (quarter t - 1) returns that correspond to changes in quarter t share holdings.

Based on Table 1.4 Panels A and B, we see that non-underwriters in general are momentum traders, consistent with prior research. Non-underwriters purchase stocks with a contemporaneous quarterly excess return of 3.38%, and a prior quarterly excess return of 3.40%. Underwriters, in contrast, make purchases subsequent to much lower positive returns. Underwriters purchase stocks with a contemporaneous return of just 0.4% and a prior return of 0.9%. The difference in underwriter and non-underwriter prior quarterly returns is -2.5%, statistically significant at the one percent level.

We now continue to examine the Quid Pro Quo Hypothesis by testing to see if underwriting institutions are liquidating their stock positions after an SEO. If the firm is only holding the stock in order to get the SEO business, then we might expect to see investment banks that become SEO underwriters buying the stock ahead of the SEO, but selling it after the SEO.

In Table 1.5 Panel A, we compare the net purchases (measured in percent of shares outstanding) of IPOs in quarters pre- and post-SEO. We see that all institutions, regardless of if they are the original IPO underwriter, are buying the stock before the SEO. IPO underwriters who are also the SEO underwriter purchase 0.20% of shares outstanding in the quarter before the firm goes through an SEO. Likewise, IPO non-underwriters who underwrite the subsequent SEO are buying 0.12% of shares outstanding.

Recall that institutional traders are, on average, momentum investors and thus buy shares as stock prices rise. SEOs are typically led by stock price run-ups so it is not surprising to see momentum investors buying before the SEO. However, in the quarter after the SEO, only the IPO underwriters are liquidating stock. They are selling 0.08% of shares outstanding for a statistically significant difference from before to after the SEO of 0.27%. Note that this figure is not only statistically significant, but is also very economically significant. With an average level of holdings of $5.6 million, this results in a decrease of nearly $1.75 million in stock holdings in the quarter after the SEO. In contrast, there is no difference between the pre- and post-SEO trades for institutions that did not underwrite the original IPO but did underwrite the SEO. There is also no difference in pre- and post-SEO trades for those institutions that did not become the SEO underwriter.

Consistent with the Quid Pro Quo hypothesis, we see that IPO underwriters who are also the SEO underwriters change their behavior after the SEO. In contrast, all the other institutional groupings are on average still purchasing shares after the SEO. It may be that IPO underwriters are liquidating their higher than average holdings after an SEO in an effort to diversify their fund's holdings. In any case, it is clear that the underwriters are behaving differently from the non-underwriters in a way that could be a breach of their fiduciary responsibility

We now use a probit regression framework to find the determinants of institutional buys. This framework allows us to incorporate the effects of prior returns on buying behavior, as well as the effects of other institutional services such as analyst coverage or SEO underwriting. The dependent variable is a dummy variable taking on a value of one (zero otherwise) if an institution purchases a stock during a particular quarter. We control for prior returns, firm size and institutional rank, as well as including dummy variables for analyst coverage and SEO underwriting in the previous quarter. These dummy variables measure whether the given institution initiates coverage or underwrites the SEO; they not measure if other institutions provide analyst coverage or underwrite SEOS. Following Petersen (2005), we report p-values using clustered standard errors in all regressions throughout the paper in an effort to control for serial correlation among manager observations.

Table 1.6 gives the determinants of stock purchases for an underwriter and a non-underwriter, respectively. The unconditional probability for an underwriter making a purchase over the first eight quarters that a stock trades is 65%, and 78% for a non-underwriter.

The regressions provide information consistent with both underwriters and non-underwriters acting as momentum traders in that their coefficients on the previous excess returns are positive. Thus, the higher the previous quarterly return, the higher the probability that the underwriter and the non-underwriter will purchase the stock. This result is statistically significant at the one percent level although the economic significance is questionable. For instance, for the underwriters, if the previous quarterly excess return of the stock were to increase one standard deviation, the probability of purchasing the stock over the subsequent quarter would increase by 2.2%. Likewise for non-underwriters, the results are statistically significant, but economically questionable. An increase in the previous quarterly excess return by one standard deviation results in an increase in the probability of a non-underwriter stock purchase by 2.6%.

The coefficient for an analyst initiation in the previous quarter provides a negative and statistically significant result of -0.19 (p-value of 0.02). This implies that if the underwriter initiated analyst coverage in the previous quarter, the underwriter is 7.4% less likely to buy stock in the current quarter. We consider two interpretations for this result to be valid. The underwriter could be selling the stock because the informational advantage possessed prior to analyst initiation is no longer present. It is also possible that the underwriter is selling the stock because they have fulfilled their implicit obligation to their clients by holding the stock and/or providing analyst coverage. In contrast, analyst initiations have no effect on when non-underwriters purchase the stock.

Both probit regressions also include dummy variables for previous quarter SEOs. The resulting coefficient is statistically significant and negative for the underwriter. This means that the underwriter is 9.0% less likely to purchase the stock in the quarter after an SEO compared to another quarter. In contrast, previous SEOs have no statistically significant effect on non-underwriter purchases. These results are consistent with the purchase and sales data contained in Table 1.5. After becoming the SEO underwriter, the IPO underwriter starts selling the stock. If an IPO non-underwriter becomes the SEO underwriter, it has no effect on their decision to trade the stock.

To this point, we have several stylized facts that support the Quid Pro Quo Hypothesis. First, underwriters hold more shares of stock for the first eight quarters that the stock publicly trades. Our univariate results show that underwriters trade less on momentum than non-underwriter institutional traders do. In addition, IPO underwriters are selling their stock after they provide additional services to the firms they have underwritten. Once the underwriter initiates analyst coverage, they are more likely to sell the stock that they hold. Also, in the quarter after an SEO, the underwriter is more likely to sell stock. Non-underwriter purchases are not significantly influenced by either analyst coverage or SEO underwriting.

Now we wish to test if the actions taken by underwriters are successful in gaining additional business for the underwriter. If the underwriter is not more likely to gain future business by initiating analyst coverage on stocks, or buying and/or holding large amounts of stock, then the facts we have observed might simply be coincidental. One of the main ways underwriters can gain additional business from the firms they take public is from subsequent equity offerings. We now study if the actions taken by equity underwriters are successful in gaining them future underwriting business with the firms they take public in the IPO.

We use a probit regression framework where the dependent variable is a dummy variable taking on a value of one (zero otherwise) if the institution is the underwriter of a secondary stock offering within the first eight quarters of trading. We use similar control variables as in our previous regressions. The variables of most interest are the underwriter flag, the analyst initiations, and the buys by IPO underwriters and non-underwriters. These regressions use only 1,415 data points because we analyze only quarters when an SEO occurs.

The first regression in Table 1.7 shows that the underwriter flag is large and statistically significant with a coefficient of 2.17. This result is not surprising as Ljungqvist and Wilhelm (2005) have reported that for 64% of firms, the firm underwriters also underwrite subsequent SEOs. If a firm has analyst coverage from an investment bank in the previous quarter, then that investment bank is 30.5% more likely to be the SEO underwriter for the firm. This result is statistically significant at the one percent level. We are not suggesting causality, simply that SEO underwriters often initiate coverage for the firm prior to the underwriting of the new security. This is another type of quid pro quo that we do not investigate here. Note that these results are in contrast to Ljungqvist, Marston, and Wilhelm (2005) who show that aggressive analyst coverage does not attract future underwriting business.

If a non-underwriter purchased the stock just in the previous quarter, there is no significant impact on whether they become the SEO underwriter. If the IPO underwriter purchased stock in the previous quarter, there is also not a significant impact on becoming the SEO underwriter. It may be that underwriters of the IPO build up their stock levels slowly over time so that our regression is not able to detect a relationship between purchases in the previous quarter and the identity of SEO underwriters. To this end, we run the second regression of Table 1.7 with institutional holdings as an explanatory variable. We feel that the level of holdings might be more important as they are the outcome of purchases over a longer period of time than simply one quarter.

These results show that the stock holdings of non-underwriters are not statistically significant determinants of SEO identity. However, IPO underwriters who hold more stock are rewarded for their higher holdings through a positive and statistically significant probability of obtaining future business as the stock underwriter (coefficient of 0.08 with a p-value of 0.02). In other words, a one standard deviation increase for the level of underwriter holdings provides an increase of 2.5% in the probability of being the underwriter for subsequent stock offerings. Note that this result obtains even after we control for the IPO underwriter identity, given that underwriting relationships are persistent. It appears that underwriter activities such as initiating analyst coverage and holding higher levels of stock subsequent to the IPO are in fact rewarded by future business with the firm in the form of SEO underwriting. We should also mention that higher institutional rank makes it significantly more likely the firm will become the SEO underwriter.

1.4.2 Testing The Superior Information Hypothesis

We now turn to an analysis of Hypothesis II: Superior Information. For every 13f filing on quarter t, we calculate future returns for quarter $t + 1$. The first data column in Table 1.8 gives the results of a regression with future quarterly excess returns as the dependent variable. The explanatory variables here include the prior quarterly return (to account for return autocorrelation), a dummy variable for institutional large buys, a cross-dummy for an underwriter large buy, the logarithm of market equity, the rank of the institution holding the stock, a dummy variable for analyst initiations by the institution in the previous quarter, and a dummy variable for the underwriter. We define a large buy as one in which the underwriter is both buying in the quarter and has stock holdings greater than the median across all observations.

We find that stock returns are positively autocorrelated in the short term as predicted by the past literature. The institutional large buy variable does not have significant predictive ability for future returns, although the underwriter large buy variable does. An underwriter buy predicts higher and statistically significant future quarterly returns of 1.92% or 7.68% per year.[9] Also, the results show that the larger the size of an IPO, the better the future performance. If an institution has a higher underwriter ranking, this does not appear to appreciably affect the subsequent returns of the institution's purchases. Analyst coverage initiation has no predictive ability for future returns.

The evidence presented in the "All Firms" column of Table 1.8 shows that underwriter/asset mangers make superior profits through their trading activities where non-underwriter institutional traders do not. However, we wish to determine when underwriters might have a particular informational advantage. As underwriters perform their due diligence, we may expect to see them make informed trades when they have the highest informational advantage. Firms with no analyst coverage might provide the best ability for underwriters to trade on their special knowledge. To this end, we run another regression using only firms that have no analyst coverage by any institution. In the "No Analyst Coverage" column of Table 1.8, we find that firms with no analyst coverage have a statistically significant return of 1.78% after underwriter large purchases. Note that

[9] If we define large buys as the top 30th percentile of purchases and small buys as the bottom 30th percentile of purchases, this increases the strength and statistical significance of our results. Our results are not appreciably changed if we define the size of a large buy for each institution or for the population as a whole.

there is no analyst coverage for the firm so the analyst coverage explanatory variable is no longer applicable for this regression. The significance of the other explanatory variables is consistent with the previous regression. When there is no analyst coverage, underwriters are able to use their special information gleaned from the due diligence process to make superior trades in the asset management division.

We then test the sample of firms that do have analyst coverage. The "Analyst Coverage" column in Table 1.8 reports that the underwriter buy variable is no longer statistically different from zero. This result implies that underwriters are not able to outperform in their large buys once there is analyst coverage for the firms. This result is consistent with the idea that underwriter managers have an informational advantage only as long as there is limited public scrutiny of a firm.

We also examine performance differences between high and low rank underwriters. High rank underwriters are defined as those underwriters with a ranking at the time of stock holdings of at least 8.1. The fourth and fifth data columns provide the ranking results. High rank underwriters earn statistically significant excess returns of 2.34% per quarter on their large purchases. Low rank underwriters, however, do not earn significant excess returns.

Finally, we test to see if SEO underwriters are capable of making superior trades in their asset management portfolios. We find that unlike IPO underwriters, SEO underwriters earn a statistically insignificant return on their large purchases. The coefficient on the large SEO underwriter buys is 1.38% with a p-value of 0.35. Thus, it appears that IPO underwriters have an informational advantage that they can exploit until there is analyst coverage. In contrast, SEO underwriters do not appear to have any informational advantage that allows them to make superior trades.[10]

We have shown that underwriter asset managers have the ability to make stock purchases prior to positive future abnormal returns. However, it is possible that these are purchases of riskier stock that should in fact have higher expected future returns. Following the recommendations in Lyon, Barber, and Tsai (1999), we control for firm risk by creating abnormal returns using a matching firm for each IPO. Each quarter, we select a matching firm in the same industry (2-digit SIC code) as the IPO,[11] with the closest market capitalization to the IPO. We require that the matching firms be "seasoned" in that they are at least five years removed from their initial public offering. We calculate matching firm and IPO returns over identical quarters, and then subtract the matching firm return from the IPO return. If a matching firm is delisted during our measurement window, we simply select another size and industry-matched firm at that point.

In Table 1.9, we report one-, two-, and three-month buy-and-hold abnormal returns for each underwriter grouping. Panel A gives the abnormal returns according to large institutional buys, while Panel B reports small institutional buys. We separate purchases in this manner under the hypothesis that underwriters will most exploit their superior information through their large purchases. If underwriters are trading consistent with the Quid Pro Quo hypothesis, it would likely be through smaller transactions.

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[10] In untabulated results, we also test if underwriter excess returns are clustered by institution, by industry, or by year. We find no statistical evidence that excess returns from underwriter large purchases are driven by just a few institutions, a few industries, or occur in only a few years. Also, underwriters' superior returns are not confined to just the first few quarters.

[11] We match on industry as opposed to book-to-market because book values can be difficult to obtain in the early quarters after an IPO.

For the large purchases in Panel A, the underwriters outperform the non-underwriters over both one- and two-month horizons. For example, over two months, the underwriters outperform non-underwriters by 1.65% (p-value of 0.01). Over three months, there is not a significant difference between the two groups. It is possible that the three-month returns are not significant because the institutional trades become public halfway through this return window. The trades of institutions are made available (through their 13f filing) to the public 45 days after the end of the quarter. Once the institutional trading information becomes available, it would be much more difficult for the institutions to earn abnormal returns. Our three-month returns are based on 45 days when the trading information would not be available, and 45 days when it would be.

In Panel B, we report abnormal returns after small institutional purchases. Returns are marginally different across the two groups at the one-month horizon, but not at the two- or three-month horizon. The results of Table 1.9 are consistent with underwriters using large purchases to exploit their superior information learned during the IPO underwriting process.

1.4.3 Robustness Tests

We provide evidence consistent with underwriters purchasing stocks after stock price declines. Our tests show results that are consistent with Hypothesis I: it appears that institutional asset managers are using their fund assets as a quid pro quo for firms going through IPOs. However, it is also possible that this result is consistent with Hypothesis II. If underwriters know that stocks are undervalued due to their superior information gathered as the underwriter, then it is only natural to expect firms to purchase stocks after a price decline. For this result to be consistent with Hypothesis II, we would expect these stocks to subsequently rebound in prices. In other words, if the underwriter is buying the stocks because they are underpriced, then the subsequent stock performance should be positive.

To this end, we examine the future returns of stocks purchased after the stock price has declined. We show in Table 1.10 that stocks purchased by the underwriters after down quarters have returns of -0.22% over the subsequent quarter. Non-underwriter purchases made after quarters of negative returns have returns of -0.21% in the subsequent quarter. The difference between these values is not statistically significant.

We also split our sample by small and large buys. We find that small underwriter buys after negative performance result in future returns of -0.81% on average where non-underwriters have future returns of -0.02%. For large buys, the figures for underwriters and non-underwriters are 0.35% and -0.41%, respectively. None of the differences between underwriters and non-underwriters are statistically significant at a meaningful level. These results imply that underwriters are not purchasing stocks after price declines in anticipation of higher future returns on these stocks.

1.5 Conclusions

There is a clear potential for conflicts of interest within an institution that underwrites securities and also manages institutional funds. At the same time, the combined underwriter/asset manager may possess superior information allowing the institution to make profits above those possible for other institutional traders. We test two main hypotheses relating the benefits and costs of underwriter/asset managers: the

Quid Pro Quo Hypothesis and the Superior Information Hypothesis. We find evidence that underwriters utilize their institutional holdings to stabilize prices or otherwise provide a quid pro quo to firms they have brought public. We also find strong support for the statement that asset managing institutions are trading on their informational advantage as underwriters, earning an annualized excess return of 7.7%.

The Quid Pro Quo Hypothesis constitutes a severe breach of trust for asset managers. One question of significance is can these activities take place in an efficient market equilibrium? In an economy with perfect information, it is clear that the underwriters of securities could never stabilize prices using institutional assets as this action would be penalized by the market. Institutions engaging in such activity would be severely punished by investors removing their assets from the management of that institution. Thus, institutional investors would not engage in price stabilization. If, however, the institutional asset manager can exploit superior information from the underwriter sometimes and provide quid pro quo for the underwritten securities at other times, it seems likely that both price stabilization and information sharing will occur in equilibrium. Our results are consistent with this conjecture. We find that while assets under management are utilized to attract more investment banking business, the assets also have positive abnormal profits in the large trades of the institution.

APPENDIX 1.

TABLES OF ESSAY 1

Table 1.1
Quarterly Holdings, Analyst Recommendations, and Secondary Stock Offerings for Office Max
IPO date: November 2, 1994

Panel A: Quarterly holdings by institutional shareholder

	Q1	Q2	Q3	Q4	Q5	Q6
Underwriters for Office Max IPO						
Dean Witter Discover & Co			415,000	25,000		
Morgan Stanley Group Inc	121,000	356,100	713,525	671,120	2,051,960	1,617,890
William Blair & Co.	27,900	25,400	38,850	30,600	34,890	25,378
Non-Underwriters for Office Max IPO						
Advest Inc.						
Bear Stearns & Co			10,200	44,252	16,650	17,800
Columbia Management Co					500,000	600,000
Credit Suisse First Boston						
Dillon Read & Co						
Goldman Sachs & Co						
HSBC Asset Management					41,850	
Kemper Financial Services		357,000	2,860,400	1,321,800		
Merrill Lynch & Co Inc	4,305	4,400		1,410	15,000	
Montgomery Asset Management	30,400	30,400	45,600	42,000	70,000	42,000
National Investment Services	116,750					
Oppenheimer Management Corp	121,500					
Paine Webber Inc			4,840	5,775		
Prudential Securities Inc		25,581	98,743	110,200	212,633	161,430
Salomon Brothers Inc						
UBS Asset Management Inc	27,200	20,200	30,300	30,300	33,053	33,053

Table 1.1 (cont)

Panel B: Analyst recommendations by institutional shareholder

	Q1	Q2	Q3	Q4	Q5	Q6
Underwriters for Office Max IPO						
Morgan Stanley Group Inc		Strong Buy				
Non-Underwriters for Office Max IPO						
Bear Stearns & Co		Strong Buy				

Panel C: Secondary stock offerings (SEO)

	Q1	Q2	Q3	Q4	Q5	Q6
Underwriters for Office Max SEO						
Dean Witter Discover & Co			SEO			
Morgan Stanley Group Inc			SEO			
William Blair & Co.			SEO			

We examine underwriters that are classified in the SDC IPO database as lead underwriters between 1993 and 1998. These underwriters must also have an asset management division that files quarterly 13f statements with the SEC. For each IPO, we refer to "underwriters" as those investment bank/asset managers that underwrite the IPO and hold shares in a given quarter. We refer to "non-underwriters" as those investment bank/asset managers that do not underwrite the given IPO, but do hold shares in the given quarter. We acquire quarterly holdings data from Thomson Financial, and analyst initiations and reiterations from IBES. SEO information comes from the SDC database. Quarter one (Q1) is the first calendar quarter after the IPO date.

Table 1.2
Summary Statistics

We examine underwriters that are classified in the SDC IPO database as lead underwriters between 1993 and 1998. For each IPO, we refer to "underwriters" as those investment bank/asset managers that underwrite the IPO and hold shares in a given quarter. We refer to "non-underwriters" as those investment bank/asset managers that do not underwrite the given IPO, but do hold shares in the given quarter. We acquire reputation rankings from Jay Ritter's website bear.cba.ufl.edu/ritter/index.html. Measurement of the first eight quarters of trading begins at the first calendar quarter after the IPO date. Two-tailed p-values are given in brackets.

Panel A: Averages across first eight quarters of trading

Average	Institutional Holder = UW	Institutional Holder = Non-UW	UW - Non-UW [p-value]
IPO Market Value (millions)	1,019.9	1,229.9	-210.0 [0.00]
IPO Monthly Turnover %	13.0	17.0	-4.4 [0.00]
IPO Offer Price	16.5	15.4	1.1 [0.00]
IPO VC-Backed %	27.7	34.0	-6.3 [0.00]
Institutional Holder Reputation Rank	8.4	7.6	0.7 [0.00]
N	6,441	28,233	

Panel B: Number of observations

	Institutional Holder = UW	Institutional Holder = Non-UW	Total Sample
Number of Distinct IPOs	1,255	2,340	2,412
Number of Distinct IPOs Issuing SEO	401	675	675
Number of Distinct IPOs with Analyst Coverage	721	506	992
Number of Distinct Institutions	68	140	141
Number of Distinct Institutions Providing Coverage	32	39	42

Table 1.3
Percentage of IPO Shares Held

We examine underwriters that are classified in the SDC IPO database as lead underwriters between 1993 and 1998. These underwriters must also have an asset management division that files quarterly 13f statements with the SEC. For each IPO, we refer to "underwriters" as those investment bank/asset managers that underwrite the IPO and hold shares in a given quarter. We refer to "non-underwriters" as those investment bank/asset managers that do not underwrite the given IPO, but do hold shares in the given quarter. Measurement of the first eight quarters of trading begins at the first calendar quarter after the IPO date. Both panels report the percentage of shares held, defined as the number of shares stated in the quarterly 13f filings (obtained from Thomson Financial) divided by the number of shares outstanding (obtained from CRSP). Two-tailed p-values are given in brackets.

Panel A: Average percentage holdings across first eight quarters of trading

IPOs Issued in	N	Institutional Holder = UW	N	Institutional Holder = Non-UW	UW - Non-UW [p-value]
1993-1998	6,441	1.24	28,233	0.92	0.32 [0.00]
1993-1995	3,595	1.19	14,758	0.94	0.25 [0.00]
1996-1998	2,846	1.30	13,475	0.90	0.40 [0.00]

Panel B: Average percentage holdings grouped by quarters

Quarters Post-IPO	N	Institutional Holder = UW	N	Institutional Holder = Non-UW	UW - Non-UW [p-value]
1993-1998					
1 – 4	3,783	1.33	14,175	1.01	0.31 [0.00]
5 – 8	2,658	1.11	14,058	0.83	0.29 [0.00]

Table 1.4
Contemporaneous and Prior Quarterly Excess Stock Returns for IPOs Bought by Institutions

For Panel A, we calculate quarterly excess stock returns in quarter *t* for all institutional IPO purchases occurring in quarter *t*. For Panel B, we calculate quarterly excess stock returns in period *t* - 1 for all institutional IPO purchases occurring in quarter *t*. We classify institutional buyers as those institutions whose quarterly change in holdings from the previous quarter is greater than zero for a given IPO. All excess returns are less the CRSP equally weighted market index. Two-tailed p-values are given in brackets.

Panel A: Contemporaneous quarterly excess returns

Institutional Holder	N	Return %
UW	4,175	0.40
Non-UW	21,881	3.38
UW – Non-UW [p-value]		-2.98 [0.00]

Panel B: Prior quarterly excess returns

Institutional Holder	N	Return %
UW	3,519	0.90
Non-UW	19,145	3.40
UW – Non-UW [p-value]		-2.50 [0.00]

Table 1.5
Stock Buys Pre- and Post-Secondary Stock Offerings

Percentage of shares bought is defined as the number of shares purchased from the previous quarter divided by the number of shares outstanding. Pre-SEO refers to quarter t - 1 conditional on an SEO occurring in quarter t. Post-SEO refers to quarter t + 1 conditional on an SEO occurring in quarter t. Two-tailed p-values are given in brackets.

Panel A: Percentage of shares bought before and after an SEO by SEO underwriter

Institutional Holder	N	Pre-SEO	N	Post-SEO	Pre SEO - Post SEO [p-value]
IPO UW	228	0.20	274	-0.08	0.27 [0.04]
IPO Non-UW	73	0.12	107	0.13	-0.02 [0.85]

Panel B: Percentage of shares bought before and after an SEO by SEO non-underwriter

Institutional Holder	N	Pre-SEO	N	Post-SEO	Pre SEO - Post SEO [p-value]
IPO UW	49	0.33	39	0.13	0.21 [0.35]
IPO Non-UW	973	0.20	1,438	0.15	0.05 [0.19]

Table 1.6
Probit Regressions for Determinants of Institutional Buys

The dependent variable is a dummy variable taking on a value of one (zero otherwise) if the institution purchases the stock in quarter *t*. Explanatory variables from quarter *t* - 1 include the quarterly excess stock return (Return $_{t-1}$), the logarithm of the market capitalization of the stock (Ln(ME) $_{t-1}$), the reputation rank of the investment bank (Institutional Holder Rank $_{t-1}$), a dummy variable taking on a value one (zero otherwise) if the institution initiates analyst coverage in the quarter (Analyst Coverage $_{t-1}$), and a dummy variable taking on a value of one (zero otherwise) if the firm issues an SEO in the quarter (SEO Offering $_{t-1}$). All excess returns are less the CRSP equally weighted market index. P-values are given in brackets, and reflect controls for heteroskedasticity and serial correlation among manager observations (clustered standard errors).

	Institutional Buyer = UW	Institutional Buyer = Non-UW
Return $_{t-1}$	0.002 [0.00]	0.001 [0.00]
Ln(ME) $_{t-1}$	-0.001 [0.93]	-0.090 [0.00]
Institutional Holder Rank $_{t-1}$	0.017 [0.77]	-0.009 [0.70]
Analyst Coverage $_{t-1}$	-0.193 [0.02]	0.153 [0.21]
SEO Offering $_{t-1}$	-0.243 [0.00]	-0.049 [0.30]
Intercept	0.258 [0.61]	1.327 [0.00]
N	5,484	24,822

Table 1.7
Probit Regressions for Determinants of SEO Underwriter Identity

The regression includes only the quarters in which a firm issues a secondary equity offering. The dependent variable is a dummy variable taking on a value of one (zero otherwise) if the institution underwrites an SEO in quarter *t*. Explanatory variables from quarter *t* - 1 include the quarterly excess stock return (Return $_{t-1}$), the logarithm of the market capitalization of the stock (Ln(ME) $_{t-1}$), the reputation rank of the investment bank (Institutional Holder Rank $_{t-1}$), a dummy variable taking on a value of one (zero otherwise) if the institutional holder is the IPO underwriter (IPO UW flag), a dummy variable taking on a value one (zero otherwise) if the institution initiates analyst coverage in the quarter (Analyst Coverage $_{t-1}$), a dummy variable taking on a value of one (zero otherwise) if the institution purchased stock in the quarter (Institutional Buy $_{t-1}$), the percentage shares the institution holds in the quarter (Institutional Holdings $_{t-1}$), and two cross-variables between the underwriter flag and the institutional buy and institutional holding variables. All excess returns are less the CRSP equally weighted market index. P-values are given in brackets, and reflect controls for heteroskedasticity and serial correlation among manager observations (clustered standard errors).

Table 1.7

Return $_{t-1}$	0.001 [0.68]	0.001 [0.69]
Ln(ME) $_{t-1}$	-0.027 [0.64]	-0.036 [0.52]
Institutional Holder Rank $_{t-1}$	0.138 [0.00]	0.138 [0.00]
IPO UW flag	2.171 [0.00]	2.110 [0.00]
Analyst Coverage $_{t-1}$	1.246 [0.00]	1.236 [0.00]
Institutional Buy $_{t-1}$	-0.024 [0.84]	
IPO UW * Institutional Buy $_{t-1}$	0.012 [0.96]	
Institutional Holdings $_{t-1}$		-0.044 [0.35]
IPO UW * Institutional Holdings $_{t-1}$		0.076 [0.02]
Intercept	-2.408 [0.00]	-2.332 [0.00]
N	1,415	1,415

Table 1.8
Multivariate Regression for Determinants of Future Quarterly Excess Stock Returns

The dependent variable is quarterly excess stock returns in quarter *t* for all institutional IPO buys or sells occurring in quarter *t - 1*. Explanatory variables from quarter *t* – 1 include the quarterly excess stock return (Return $_{t-1}$), the logarithm of the market capitalization of the stock (Ln(ME) $_{t-1}$), the reputation rank of the investment bank (Institutional Holder Rank $_{t-1}$), a dummy variable taking on a value of one (zero otherwise) if the institutional holder is the IPO underwriter (IPO UW flag), a dummy variable taking on a value of one (zero otherwise) if the institutional holder is the SEO underwriter (SEO UW flag), a dummy variable taking on a value one (zero otherwise) if the institution initiates analyst coverage in the quarter (Analyst Coverage $_{t-1}$), a dummy variable taking on a value of one (zero otherwise) if the institution makes a large stock purchase in the quarter (Institutional Large Buy $_{t-1}$), , and cross-variables between the IPO and SEO underwriter flags and the institutional large buy variable. A large buy is defined as those institutions that hold more shares than the median and also buy in a given quarter. All excess returns are less the CRSP equally weighted market index. Analyst coverage (no analyst coverage) observations are IPOs that have at least one (zero) analyst that have covered the firm since the IPO date. High (low) underwriter rank observations have a ranking at the time of stock holdings of at least (not more than) 8.1. P-values are given in brackets, and reflect controls for heteroskedasticity and serial correlation among manager observations (clustered standard errors).

Table 1.8

	All Firms	No Analyst Coverage	Analyst Coverage	High Rank UW	Low Rank UW	SEO UW
Return $_{t-1}$	0.03 [0.00]	0.03 [0.00]	0.04 [0.00]	0.03 [0.00]	0.03 [0.01]	0.03 [0.00]
Institutional Large Buy $_{t-1}$	-0.08 [0.86]	-0.14 [0.80]	0.34 [0.63]	-0.36 [0.51]	0.59 [0.36]	0.23 [0.59]
IPO UW * Institutional Large Buy $_{t-1}$	1.92 [0.00]	1.78 [0.04]	1.72 [0.13]	2.34 [0.00]	0.63 [0.73]	
SEO UW * Institutional Large Buy $_{t-1}$						1.38 [0.35]
Ln(ME) $_{t-1}$	0.96 [0.00]	0.17 [0.30]	1.38 [0.00]	0.82 [0.00]	1.17 [0.00]	0.97 [0.00]
Institutional Holder Rank $_{t-1}$	0.02 [0.84]	0.06 [0.71]	0.02 [0.91]	0.38 [0.44]	0.30 [0.17]	0.00 [0.97]
Analyst Coverage $_{t-1}$	-0.44 [0.72]		0.26 [0.86]	1.34 [0.38]	-1.06 [0.63]	1.09 [0.41]
IPO UW Flag	-0.94 [0.03]	-1.13 [0.08]	-0.85 [0.24]	-1.04 [0.04]	-1.59 [0.06]	
SEO UW Flag						-1.46 [0.18]
Intercept	-5.67 [0.00]	-2.19 [0.18]	-7.57 [0.00]	-8.02 [0.04]	-8.32 [0.00]	-5.77 [0.00]
N	33,979	22,164	11,815	25,028	8,951	33,979

Table 1.9
Future Abnormal Stock Returns for IPOs Bought by Institutions

Panel A reports the quarterly excess stock returns in quarter t for all institutional IPO large purchases occurring in quarter $t - 1$. A large buy is defined as those institutions that hold more shares than the median and also buy in a given quarter. Panel B reports the quarterly excess stock returns in quarter t for all institutional IPO small purchases occurring in quarter $t - 1$. A small buy is defined as those institutions that hold fewer shares than the median and also buy in a given quarter. Abnormal returns are calculated using a matching firm technique. For each IPO, a matching firm is chosen in the same industry (2-digit SIC code) with the closest market capitalization for the given quarter. Matching firm and IPO returns are calculated over identical periods. Abnormal returns reflect the IPO return minus the matching firm return. One-tailed p-values that test whether the return difference is greater than zero are given in brackets.

Panel A: Abnormal returns (%) for large institutional buys

	N	1-Month	2-Month	3-month
IPO UW	2,088	-0.06	0.40	0.95
IPO Non-UW	10,505	-0.93	-1.25	0.11
IPO UW - IPO Non-UW [p-value]		0.87 [0.05]	1.65 [0.01]	0.84 [0.17]

Panel B: Abnormal returns (%) for small institutional buys

	N	1-Month	2-Month	3-month
IPO UW	2,001	0.51	-0.13	0.01
IPO Non-UW	10,651	-0.21	-0.69	0.14
IPO UW - IPO Non-UW [p-value]		0.72 [0.09]	0.56 [0.21]	-0.14 [0.44]

Table 1.10
Future Quarterly Excess Stock Returns for IPOs Bought by Institutions (Negative Prior Returns Only)

We calculate quarterly excess stock returns in quarter *t* for all institutional IPO purchases occurring in quarter *t - 1*, but consider only observations where the excess return in quarter *t - 1* is negative. A large buy is defined as those institutions that hold more shares than the median and also buy in a given quarter. A small buy is defined as those institutions that hold fewer shares than the median and also buy in a given quarter. All excess returns are monthly returns less the CRSP equally weighted market index. One-tailed p-values that test whether the return difference is greater than zero are given in brackets.

Institutional Holder	N for all Buys	Return % for all Buys	Return % for Small Buys	Return % for Large Buys
IPO UW	2,244	-0.22	-0.81	0.35
IPO Non-UW	10,817	-0.21	-0.02	-0.41
IPO UW – IPO Non-UW [p-value]		-0.00 [0.50]	-0.79 [0.78]	0.76 [0.21]

ESSAY 2. VOLUNTARY EARNINGS DISCLOSURE DURING THE QUIET PERIOD

2.1 Introduction

Managers can release information through regulated filings with the SEC (for instance, 10Q reports), through information intermediaries such as stock analysts, or through discretionary disclosures using press releases. Of these media, discretionary press releases are the least studied and one of the most interesting methods of information dissemination by a manager. But direct press releases are difficult to study due to the large range of information that can be released through this medium and the lack of structure to a discretionary press release. In addition, it is often unclear if managers are releasing information to the public because they have established a track record of doing so and they are trying to maintain their record, or they have some good news to release to the market. To simplify the analysis of discretionary disclosure, we choose a unique setting to study information disclosure. We choose a subset of firms that have high information asymmetry, a limited amount of public information about operating performance, and no track record of earnings releases: firms conducting initial public offerings.

In the context of an initial public offering, we have a unique opportunity to study under what conditions information is released through a discretionary press release. This is due to the fact that firm disclosure is largely regulated by the securities exchange commission during the quiet period that follows an initial public offering. We use the quiet period setting as a natural experiment to examine the conditions under which the manager releases information through a discretionary press release. SEC regulation limits firms from any activities that would be seen as "marketing the security," prohibiting the release of any forward-looking statements.[12] Using the quiet period to study discretionary disclosure is important because it limits the type and amount if information that can and will be released by the firms studied. What managers have discretion over during the quiet period is the release of historical earnings of the firm prior to the customary quarterly filings. The release of this earnings information during the quiet period is the focus of this paper.

We find that firms releasing earnings information during the quiet period tend to be larger more mature firms with more prestigious underwriters. This is not surprising in that larger firms are more likely to have better internal controls to allow the early release of earnings. Quiet period earnings releasing firms also tend to have performed better over the quarter for which they are releasing earnings. However, firms are also more likely to release earnings after higher market volatility the first five days the stock trades. This result implies that managers consider more than just the performance of their firm in the release of earnings information. In other words, it appears that managers are timing the market.

On average, the firms releasing earnings during the quiet period have a positive stock price response of 2.04% around the earnings release date. We find a positive

[12] The U. S. Securities and Exchange Commission release #5180 says that " ...any publication of information by a company in registration other than by means of a statutory prospectus should be limited to factual information and should not include such things as predictions, projections, forecasts or opinions with respect to value." This disclosure limitation applies to the whole period "...during which dealers must deliver a prospectus [to investors in the firm]." In our sample period, this time lasts from the time the firm has an agreement with the underwriter until 25 days after the IPO date.

relationship between earnings release abnormal returns and the volatility of the stock but no relationship with the abnormal operating performance of the firm. The fact that the market reacts not to the superior earnings performance of the firm, but to the firm volatility once again implies that managers are timing the market in their press releases. Managers release earnings information when their stock price is more volatile and the market responds with a higher increase in stock prices. An increase in IPO firm volatility of 1.0% over the first five days the IPO trades results in an increase in market response to the discretionary disclosure announcement of 1.5%. Finally we predict and find that firms releasing earnings during the quiet period are more able to attract analyst coverage compared to firms not releasing earnings during the quiet period. The increase in analyst coverage comes from analysts not affiliated with the underwriter of the IPO.

This paper contributes to the literature in several ways. First, the paper tests the determinants of disclosure and the market response to this disclosure. There are many theoretical explanations for disclosure, most revolving around information asymmetry reduction. This paper attempts to determine what causes firms to release earnings. Also, it is not clear if market reactions to discretionary disclosure are reactions to the information contained in the disclosure or reactions to the fact that a disclosure was made. The old adage of no news is good news is clearly not true in the case of firm disclosure. But is it the case that any news is good news or is it simply the case that only good news gets released? This paper attempts to disentangle these two effects.

The paper also goes to the very start of managerial decision making concerning information release. As pointed out by Core (2001), studies of discretionary disclosure are actually equivalent to studies of disclosure policy. This is because an act of discretionary disclosure is a direct function of and a strong proxy for the disclosure policy of the firm. But in the current paper, they are one and the same thing. An IPO firm has no disclosure policy until it decides to release or not release earnings. As such, the current research studies the genesis of a firm's disclosure policy.

Finally, the paper attempts to separate the endogenous relationship between analyst coverage and information asymmetry. We study a subset of firms that have no analyst coverage not because analysts choose not to cover the firms, but because SEC regulation forbids coverage.[13] This allows us to better understand the information conditions under which analysts might be likely to cover firms.

The remainder of the paper is organized as follows. The next section discusses the previous literature relating to information disclosure and how it might affect IPO firms. Section II develops the hypotheses we will test and provides a framework for our analysis. We describe the data and do some preliminary analysis in Section III. Section IV conducts the major tests of our hypotheses and reports our findings. In Section V we discuss our findings and conclude the paper.

2.2 Background

Managers can disclose information for several reasons but most of these reasons revolve around the idea that the manager is better informed about the value and prospects of her firm than the market. Initial research by Leland and Pyle (1977) and Myers and Majluf (1984), among others, implies that there is an adverse selection problem for firms

[13] Technically, the SEC regulation only forbids the coverage of underwriter affiliated analysts of the firm. However, unaffiliated analysts typically wait for the end of the quiet period to initiate coverage as well.

selling securities. As such, firms will release information about the value of the firm to decrease information asymmetry when they wish to sell new securities, either stock or bonds. However, these explanations for disclosure do not account for the fact that firms release information at times when they are not selling stock or bonds.

Diamond (1985) develops a model that shows that firms will release information even in the absence of explicit regulatory requirements to do so. Although firm disclosure reduces the incentives to acquire private information, there are two benefits to firm disclosure shared by the market participants. First, individual investors no longer need to expend resources on acquiring information. Second, there is an improvement in risk-sharing among the market participants when firms disclose information. These results imply that investors will want the managers to release information in a discretionary manner.[14]

This line of thought is extended by Lang and Lundholm (1996) to consider the relationship between information disclosure and analyst coverage. They show that firms with more precise disclosure have more analyst coverage. Their results imply that it is costly for analysts to provide coverage for a firm and less costly if there is more information available about the firm. But Healey and Palepu (2001) point out that this relationship is endogenous. Further, the effect of voluntary disclosure on analyst following is not clear. Analysts may prefer less disclosure in that it allows them to distribute information directly from managers creating a higher demand for their services.

In the context of equity offerings, two papers discuss the role of disclosure. Lang and Lundholm (2000) discuss the effect of firm disclosures prior to firms condusting

[14] Healey and Palepu (2001) point out that information is a public good that is paid for by investors but shared by current and potential investors. This freeriding by potential investors implies that information will actually be underproduced by the company.

seasoned equity offerings. They find that firms that increase their disclosure prior to equity issuance have high stock price run-ups prior to the equity issuance announcement. However, the market discounts this increase in disclosure and these stocks tend to decline more than firms that do not increase their disclosure prior to equity issuance. Schrand and Verrecchia (2004) look at the disclosure of private firms prior to their initial public offerings and find that firms with more disclosure have lower underpricing in the IPO. This study documents the disclosure practices of a subset of IPOs prior to their going through the IPO process and argues that the lower underpricing of the IPO is caused by the lower level of information asymmetry for the firms releasing more information.

Our work is unique, however, in that it examines the relationship between disclosure and economically important factors beyond the underpricing of the IPO. In particular, we are interested in the relationship between disclosure and the market reaction to this disclosure. We consider the possibility that managers strategically release news when it benefits their firm the most and the market reacts to this strategic release of news appropriately. Consider a firm whose operating performance is only average compared to industry peers. This firm may have few incentives to disclose information in that the market will correctly anticipate the mediocrity of the firm's performance. However, if the firm has mediocre performance, but that firm's stock or the general stock market has been going down recently, then even a mediocre firm may have incentives to release earnings simply to assure investors that the firm is performing acceptably well. In contrast, if a firm's operating performance is mediocre, but the firm's stock or the general market have been doing very well recently, then the managers may withhold information from the market. We also look directly at the relationship between disclosure and the

IPO firm's ability to attract financial analysts. As pointed out by Lang and Lundholm (1996) information disclosure by the firm may make it less costly for analysts to cover the firm and ultimately attract more analyst coverage. This is important because and increase in analyst coverage may help to reduce the firm's information asymmetry and ultimately, the cost of capital for the firm.

2.3 Hypothesis Development

As has already been discussed, most disclosure incentives for managers deal with the alleviation of information asymmetry problems. The literature has tested in the past if good news generally comes earlier than bad news (see Begley and Fischer (1998) and Chambers and Penman (1984) for example). The implications for IPO firms releasing earnings during the quiet period is simply that firms with better operating performance will release information during the quiet period. This idea leads to our first hypothesis for why firms release earnings during the quiet period.

> **Hypothesis I: Superior Performance Hypothesis:** Firms with operating performance above the market expectations for the firm will release earnings information earlier than other firms.

This hypothesis states that firms release earnings during the quiet period because they outperform the general market expectations for that firm. The only consideration that managers make in whether to release earnings or delay the release of earnings is the performance of their firm relative to expectations. Firms that delay the release of earnings until after the expiration of the quiet period according to the Superior Performance Hypothesis are firms that perform poorly.

The Superior Performance Hypothesis has several empirical implications that are easily tested. First, if IPO firms perform well relative to expectations, then they should be more likely to release earnings during the quiet period. Also, the stock price response to the news release should be positively related to the operating performance of the firm: if the firm releases more positive information on the release date, the stock price response should be higher.

However, it is also possible that managers use more than just the subset of information about their firm operating performance in making the decision of when to release earnings. For instance, managers might release earnings information when their stock performs poorly to signal that their operating performance if not as bad as the market price implies. Managers may also release earnings when the overall market performs poorly as a way to show that their firm is performing better than the general market. This conjecture motivates our second hypothesis.

> **Hypothesis II: The Market Timing Hypothesis:** Managers consider information about their own operating performance as well as their own stock returns, stock volatility, market returns, and market volatility in determining when to release earnings.

The Market Timing Hypothesis has some testable implications beyond those of the Superior Performance Hypothesis. Both hypotheses predict that firms with higher operating performance will have a higher probability of releasing earnings during the quiet period. However, the Market Timing Hypothesis also predicts that quiet period release will occur for reasons other than high operating performance. For instance, if the stock performance is very negative or very volatile despite average operating performance, the firm will release earnings simply to signal that the firm is of average quality. [15] In addition, if the market return is highly negative or very volatility despite average operating performance, the firm will release earnings to signal its quality. Thus, we see that the Market Timing Hypothesis has several implications for the probability of early earnings release above the Superior Performance Hypothesis.

The Superior Performance Hypothesis implies that the return on the day the earnings information is released will be related to the operating performance of the firm. However, the Market Timing Hypothesis predicts that there should be a relationship between the stock response to earnings release and other factors. For instance, if the stock market in general or the IPO stock in particular have been performing poorly (either through high volatility or through low returns) then the earnings announcement return should be larger than if the firm has not had poor past stock performance.

2.4 Data and Preliminary Analysis

[15] There is no reason to expect a firm with poor stock performance and poor operating performance to release earnings during the quiet period. In such a situation, it would seem that the market already anticipates the poor operating performance of the firm without any information release from management.

2.4.1. *Data*

Our data source for IPOs from 1993 through 1998 is the Securities Data Company (SDC) new issues database. We begin our sample period in 1993 so that we have analyst coverage for the IPOs[16] and end our sample in 1998 to avoid any shifts in regime for important control variables as documented in Loughran and Ritter (2004). Stock return information is collected from the Center for Research in Security Prices (CRSP). Firms must meet teh following criteria. The IPOs must have an offer price midpoint of at least $5 per share. Unit offerings, closed-end funds, Real Estate Investment Trusts (REITs), partnerships, non-U.S. operating companies (as defined by CRSP), and American Depository Receipts (ADRs) are excluded from the sample universe. Our final sample includes 2,075 IPOs.

Firms are considered to release earnings during the quiet period if the IPO releases earnings information using a non-SEC filing avenue (such as a press release) during the quiet period. To determine this, we review all articles released in the Dow Jones newswire (using the Factiva Database) from the IPO date until the end of the quiet period 25 days later. Information not related to the firm earnings or earnings information released on the day of the quarterly filing are not considered as earnings information released during the quiet period through discretionary means. Of the 2,075 firms sampled, 132 released earnings during the quiet period in a press release.

2.4.2 *Sample Statistics*

Table 2.1 provides a breakdown for firms that release earnings during the quiet period. The table is split out into two categories: firms not releasing earnings during the quiet period and firms releasing earnings information during the quiet period. Panel B

[16] I/B/E/S data coverage begins in 1993.

shows that firms releasing earnings during the quiet period are not clustered in any particular year and Panel C shows that the quiet period earnings releasing firms are not disproportionately clustered in any particular industry.

In Table 2.2 we report the characteristics of the IPOs that do not release earnings during the quiet period and compare them to firms that do release earnings during the quiet period. We can see, for instance, that quiet period earnings releasing firms have a market capitalization of $424 million on average where non-releasers have a market capitalization of $204 million. We can also see that earnings releasers offer a greater number of shares in the IPO, have higher ranked underwriters, and have higher offer prices.

2.4.3 *Quiet Period Stock Returns*

To determine if the release of earnings information during the quiet period has any effect on the firms releasing earnings, we look at the short-term returns in the marketplace. If earnings release does not elicit a return response in the market, then it seems unlikely that the release of the earnings is adding any new information to the market. Table 2.3 Panel A provides evidence that the earnings release is providing new information to the marketplace. In particular, we see that the two day excess return (IPO return less the equally weighted index) for the firms releasing earnings during the quiet period is a positive and statistically significant 2.04%. Figure 2.1 illustrates the cumulative abnormal returns around the date of the earnings release for firms releasing earnings during the quiet period.

In Table 2.3 Panel B we summarize the cumulative abnormal returns (IPO return less the equally-weighted index) over the whole quiet period (25 calendar days) for non-quiet period releasing firms and quiet period releasing firms. We see that in general, quiet period releasing firms have an abnormal return of 1.46% whereas non-releasing firms have an abnormal return of 0.53%. This difference is not statistically significant. We also look at the cumulative abnormal returns over the first five trading days starting from the IPO date. We see that the quiet period releasing firms have a CAR of -0.15% where the non-releasers have a CAR' of -0.06%. Once again, this difference is not statistically significant.

We also summarize the excess stock volatility for the whole quiet period and over the first five trading days for non-quiet period releasing firms and quiet period releasing firms. We can see that over the whole quiet period non-quiet period releasing firms have an excess return volatility of 3.6% compared to quiet period releasing firms that have a volatility of 3.9%. This difference is statistically significant at the 10% level. The volatility of non-quiet period releasing firms over the first five trading days is 3.5% compared to quiet period releasing firms that have a volatility of 3.85%. This difference is statistically significant at the 5% level.

2.5 Test of Hypotheses

2.5.1 *Probability of Quiet Period Earnings Release*

We are interested in determining what causes a manager to release earnings during the quiet period. The first set of tests we conduct consists of looking at the determinants of quiet period earnings release to try to distinguish between the Superior Performance and the Market Timing hypotheses. Several of our explanatory variables

(Market volatility, Market return, IPO CAR, and IPO volatility) are calculated over the first five trading days that the stock trades. As such, we eliminate all earning releases during the quiet period that occur prior to day 6. This eliminates two observations from our sample.

Since we are interested in what influences firms to release earnings during the quiet period, we use a logistic regression with the dependent variable being a dummy variable taking a value of one if the firm releases earnings information during the quiet period and zero otherwise. Our initial regression contains several explanatory variables that might be important in determining the probability of releasing information during the quiet period. We control for IPO underpricing because firms with higher underpricing might have more uncertainty and therefore, be more likely to release information during the quiet period. We control for the proceeds of the IPO, a proxy for firm size known at the time of the IPO. Larger firms are more likely to have the internal controls that allow them to release earnings information earlier than smaller firms. We also control for underwriter rank using a dummy variable taking a value of one if the underwriter rank is 9 and zero otherwise. This underwriter ranking system was originally developed by Carter and Manaster (1990) and has been updated in Appendix 3 of Loughran and Ritter (2004). The rank of the underwriter might be important because firms may use a quiet period earnings release to compensate for not having a highly ranked underwriter to certify their firm value.

We control for the revision of the offering (offer price minus the offer range midpoint divided by the offer range midpoint) because firms with higher revisions will have higher demand in the marketplace. Presumably, the market may have lower expectations for information release if the firm is has more investors interested in buying the stock. Finally, we control for venture capital backing with a dummy variable taking a value of one if the IPO is backed by a venture capitalist and zero otherwise. This control is important as venture capitalists often have substantial controlling interests in IPOs and may desire the firm to release earnings in a certain way to help create information momentum.[17]

The results for our baseline regression are contained in Table 2.4. This table shows that the probability of releasing earnings during the quiet period is positively related to the firm underpricing. This value is statistically significant at the 1% level and implies that an increase in underpricing of one standard deviation or 26% results in an increased probability of earnings period release of 1.3%. Note that the unconditional probability of quiet period earnings release is 6.3% so the effect of underpricing is quite economically significant. This result for underpricing is likely related to information asymmetry. Firms with higher information asymmetry are more likely to have higher underpricing and to benefit more from disclosure.

Likewise, we can see that the probability of a quiet period earnings release is positively related to the size of the offering and statistically significant at the 1% level. This implies that an increase in firm proceeds by one standard deviation results in an increase in the probability of releasing earnings of 1.6%. This result is not surprising either in that larger firms with better internal controls are likely to have a better control over the internal process of generating the information for a press release. Thus, they are more likely to make earnings announcements during the quiet period.

[17] See Aggarwal, Krigman, and Womack (2002) for a further discussion of information momentum.

We now extend the model to look at other determinants of earnings release during the quiet period. Model (2) adds the market volatility for the first five days the stock trades as an explanatory variable in the regression. This variable is the standard deviation of the value weighted index for the first five days the stock is publicly traded. Note that the coefficient on market volatility is positive and statistically significant. The magnitude of the variable implies that a 1% increase in the stock market volatility implies a 2.48% increase in the probability of releasing earnings during the quiet period. This result is not only statistically significant, but is very economically significant as well. The positive relationship between market volatility and the probability of an earnings release is the first evidence we present consistent with the Market Timing Hypothesis. If firms are releasing earnings during the quiet period after periods of higher market volatility, then managers appear to release earnings information to signal their quality despite the high market volatility.

In Model (3) we look at the cumulative market return for the first five days that the IPO trades. We find that the firm is less likely to release earnings information if the market return is positive, although this variable is not statistically significant. We then test a dummy that takes a value of one if the firm is a technology stock and zero otherwise. We use the definition of a technology stock given in Loughran and Ritter (2004) Appendix 4. We find that technology stocks are more likely to release earnings during the quiet period. Although it initially might appear that high technology stocks being more informationally opaque are using the quiet period to release more information, we shall see later that this may simply be due to higher than usual operating performance for IPO firms in the technology industry.

We then test the IPO stock price cumulative abnormal return and the excess return volatility for the first five days the stock trades on the open market to determine if these stock price movements are influencing managers to release news during the quiet period. We define excess return as the stock return less the equally-weighted stock index. Models (5) and (6) provide results for the IPO stock price movements and show that negative stock price movements and high stock volatility imply a higher probability of releasing earnings information during the quiet period. Note that neither of these coefficients are statistically significant.

We then test a major implication of the Superior Performance Hypothesis: firms with higher abnormal earnings will be more likely to release earnings during the quiet period. We measure abnormal operating performance as the IPO operating income in the quarter that has not yet been reported divided by the assets of the IPO minus the average operating income divided by assets for all firms matched to the IPO based on two digit SIC code. This proxy for abnormal performance is necessary since there are no analyst projections to compare the earnings performance to. As such, we use the two-digit SIC code matched industry average income over assets as our benchmark. There is a problem with this proxy in that it will only be able to detect a certain type of superior earnings performance. If the IPO firm performs better than all other firms in the same industry, then this measure of abnormal operating performance will accurately show that the firm performs well. However, if all the firms in the industry of the IPO firm do well compared to the rest of the market, then this proxy will not detect abnormal performance. Note that we lose 538 data points when we use the quarterly accounting information from CRSP in the regression.

Model (8) shows that IPO firms with better abnormal operating performance are more likely to release earnings during the quiet period. The statistically significant coefficient on abnormal operating performance implies that an increase in abnormal operating performance of one standard deviation results in a 0.8% increase in the probability of releasing earnings during the quiet period. This result supports the Superior Performance hypothesis in that firms with better performance are more likely to release earnings during the quiet period.[18]

Combining all the explanatory variables into one regression shows that the explanatory power for market volatility and abnormal operating performance are not reduced when both are taken into consideration. The results of this regression are in Model (9). This model shows that both the market volatility and the abnormal operating performance of the firm have explanatory power for the release of earnings during the quiet period. Note, however, that the technology dummy variable is no longer significant. This result implies that the technology dummy is being subsumed by the abnormal performance variable (compare models (7) and (9)). So we have seen that firms are more likely to release earnings if markets have recently been volatile or if the firm has performed better. Both of these findings are consistent with the Market Timing hypothesis but only the latter is consistent with the Superior Performance hypothesis.

2.5.2 *Determinants of the Stock Price Response to Earnings Announcements*

We then conduct tests on the determinants of the stock price excess return at the time of the earnings announcement. Once again, we drop two observations for firms that release earnings during the first five days that the IPO is trading. This gives us a sample

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[18] This finding is also consistent with the literature that shows that firms with better results tend to release information earlier. See, for instance, Begley and Fischer (1998).

of 130 firms that release earnings during the quiet period. The dependent variable in Table 2.5 is the cumulative abnormal return (IPO return less the equally-weighted index) for the IPO from day -5 to day 5 around the earnings announcement date. We use the same control variables in Table 2.5 as in Table 2.4: firm underpricing, the log of the IPO proceeds, a dummy variable for a high underwriter rank, the offer price revision, and a dummy variable for venture backing. Note that of these variables, only the underpricing is statistically significant. However, the interpretation of this variable is difficult because underpricing proxies for two difference things. Higher underpricing implies more uncertainty for the stock issue. But higher underpricing also implies a higher amount of demand for the stock.

We then check for a relationship between the announcement day return and the market volatility the first five days the stock is traded, the market return the first five days the stock is traded, a technology dummy variable, the IPO cumulative abnormal return the first five days the stock is traded, and the IPO volatility the first five days the stock is publicly traded. Of these variables, only the IPO volatility is statistically significant in its relationship with the earnings announcement date. The coefficient on the IPO volatility implies that an increase in stock volatility of 1% for the first five days the stock trades will result in an increase in the announcement returns of 1.5%. This result is very economically significant considering the average return on the announcement date is 2.0%.

We then include the abnormal operating performance for the IPO as defined earlier in the regression. The sign on the coefficient for this variable is positive as would be expected, but is not statistically significant. This result tells us that the market does not react more positively to an earnings release if the earnings release is more positive. At this point, it is worth making a few comments about regressions (8) and (9) in Table 2.5. First, note that there is a loss of 31 data points once we use the quarterly income variables for these regressions. This might explain why there is no statistical significance for the variable. It is also possible that our proxy for abnormal operating performance is not as precise as we would like.

Our results thus far have shown that the probability of releasing earnings is positively related to how good the earnings are and the market volatility just before the earnings release. However, the stock price reaction is not related to these things, but is related to the stock volatility for the firm releasing earnings. This result implies that a high operating performance value only allows the manager the opportunity to signal to the market the firm's quality. If the operating performance of the firm is low, then the managers are not likely to release earnings. However, the market is not particularly interested in the operating performance of the IPO firm. The market seems more concerned with the volatility of the IPO firm. Under conditions where the IPO firm has a high volatility conditional on releasing earnings during the quiet period, the IPO has a higher abnormal return. This result is unique in that it implies that the market is reacting to the signal of high earnings by adjusting its expectations relative to firm stock volatility, not relative to the earnings information per se. This result is consistent with the Market Timing hypothesis in that managers release information in response to periods of high market volatility and high earnings performance, but the market reacts to the firm volatility, not to the earnings information itself.

Note that another possibility is that firms with higher volatility are faced with higher information asymmetry. Thus, by releasing earnings for a high volatility firm, the management has effectively reduced the information asymmetry more than for a lower volatility firm. In either case, the market seems to be more concerned with the firm characteristics than the information contained in the earnings release.

2.5.3 *Analyst Coverage and Quiet Period Earnings Release*

We are interested to see what the benefit of releasing earnings during the quiet period might be. Research by Aggarwal, Krigman, and Womack (2002) implies that insiders might be interested in creating information momentum to keep stock prices high until they can sell at the lockup expiration. They show that firms are able to attract more analyst coverage through information momentum. Managers are not concerned with underpricing in this model because they consider the stock price at the expiration of the lock-up, not on the first day of trading. Such an argument for information momentum might also be made for earnings information release. Managers have incentives to establish track record for early and credible disclosure and may be concerned with the cost of equity for future stock issuances. Johnson and Marietta (2006) show that 28% of IPO firms during this sample period go through seasoned equity offerings within two years of the IPO date. As such, releasing high quality information quickly and consistently is important for the firm to minimize its cost of future equity issuance.

We look at analyst coverage because the literature has shown that firms benefit from analyst coverage (see Bradley, Jordan, and Ritter (2003)). Further, analyst coverage is a public piece of information that is easily quantifiable unlike the establishment of an earnings release track record. We use the I/B/E/S database to track the initiation of analyst coverage.[19] For each firm, we examine the number of analyst initiations as well as the strength of the initiation for the first 90 days after the IPO.

Table 2.6 provides summary statistics for the analyst recommendations separated out by firms releasing earnings during the quiet period and firms not releasing earnings during the quiet period. In Panel A we can see that of the 1,943 firms not releasing earnings during the quiet period, 702 or 36.1% of the IPOs have no analyst coverage within 90 days of the IPO. For firms releasing earnings during the quiet period, 19.7% (26 out of 132) do not receive any analyst coverage. Looking through the balance of the table, it appears that there might be a slightly higher incidence of analyst recommendation for the earnings period releasing firms compared to the non-earnings releasing firms. However, it should be remembered that these firms are also larger and have higher underwriter rankings. These variables are correlated with analyst coverage (see Cliff and Denis (2004)).

Moving to Table 2.6 Panel B. we can see that there were 2,944 analyst recommendations made for the 1,943 firms not releasing earnings during the quiet period. Of the 2,944 recommendations, 1,538 or 52.2% were strong buy recommendations. There were 286 analyst recommendations for the 132 firms releasing earnings during the quiet period and 55.2% of these were a strong buy (158 out of 286). We use the I/B/E/S practice of coding a 1 as a strong buy, a 2 as a buy, a 3 as a hold, a 4 as a sell, and a 5 as a strong sell. Table 2.6. Panel C. shows the average recommendation level aggregated over each firm receiving recommendations. We see that on average, firms not releasing earnings information during the quiet period have a stock recommendation of 1.53 where

[19] We also examine the analyst coverage data from Briefing.com. This data is more complete, but is only available starting in 1998. For more information concerning analyst coverage data, see Bradley, Jordan, and Ritter (2003).

firms releasing earnings have a higher recommendation value of 1.48 (recall, a 1 is a strong buy, a 2 is a buy, etc.). The difference between these two values is small, but is statistically significant at the 10% level.

We are now interested in determining if underwriter/analysts are more likely to cover a firm if the firm releases earnings during the quiet period. Such coverage could be coordinated by the underwriter prior to the IPO. The underwriter could trade off coverage for greater information release. Lang and Lundholm (1996) state that analysts are more likely to provide analyst coverage for firms that release more information as this coverage is less costly to the analyst. Underwriter/analysts make decisions about covering a firm based on the information available about the firm and more information may make it less costly for the underwriter/analyst to provide coverage. However, it is also possible that the underwriter/analyst has more private information gleaned from the underwriting relationship than other analysts and does not want more public disclosure. For these analysts, it is possible that public disclosure would reduce their informational advantage.

To test this conjecture, we use a logistic regression with the dependent variable being a dummy variable that takes a value of one if the underwriter has an analyst that provides coverage of the firm within 90 days of the IPO and zero otherwise. This regression has control variables for the backing of the IPO by a venture capitalist, whether or not the firm is listed on the Nasdaq, the ranking of the underwriter, the number of managing underwriters, the size of the firm, a dummy for a high technology company, the performance of the firm (buy and hold return from the IPO day closing until three days before the quiet period end), and the underpricing of the firm. These explanatory variables are chosen based on previous work by Cliff and Denis (2004) and Bradley, Jordan, and Ritter (2003). Of these explanatory variables, only Nasdaq listing and firm size have explanatory power for when an underwriter/analyst provides coverage for the IPO firm. Table 2.7 Panel A shows these results.

We then include a dummy variable taking a value of one if the firm releases earnings during the quiet period. From this regression, we find that underwriters are not more likely to initiate analyst coverage for the firm if the firm releases earnings during the quiet period (see Model (2) in Table 2.7 Panel A). This result implies that underwriter/analysts do not use the information environment of the firm to make a decision about analyst coverage. It may also be that underwriters decide on providing analyst coverage long before the stock ever goes public.

In Table 2.7 Panel B we use the same model to determine if analysts overall use the information environment to make decisions about coverage. Only now the dependent variable is a dummy variable taking a value of one if any analyst (not just an underwriter affiliated analyst) provides analyst coverage and zero otherwise. Note that the determinants of any analyst coverage shown in Model (1) are slightly different than the determinants of underwriter affiliated analysts. For instance, we now see that venture backing is a statistically significant determinant of analyst coverage. This is likely the case as non-underwriter analysts are at an informational disadvantage to underwriter/analysts and may get a benefit from outside certification by venture capitalists. Further, the number of managing underwriters is also an important determinant of non-underwriter affiliated analyst coverage. This result is consistent with Bradley, Jordan, and Ritter (2003).

When we include a dummy variable for the firm disclosing earnings during the quiet period, we find that unlike the underwriter analysts who are not more likely to provide coverage after a quiet period earnings release, analysts in general are more likely to provide coverage after a quiet period earnings release. In fact, an earnings release results in an increase in the probability of analyst coverage of 9.2%. This result is economically significant considering the unconditional probability of analyst coverage is 42.3%. This result is statistically significant at the 5% level.

Thus far we have seen that the probability that a firm is covered by an underwriter affiliated analyst is not affected by quiet period earnings release. However, the probability that the universe of analysts cover a firm is increased when the firm releases earnings during the quiet period. This result implies that unaffiliated analysts are more likely to provide coverage of the firm if the firm releases earnings during the quiet period. But we are interested in more than if a firm is covered. Bradley, Jordan, and Ritter (2003) show that multiple analyst initiations result in subsequently higher returns at the quiet period expiration. Therefore, the quantity of analyst coverage is important in addition to whether a firm is covered or not.

To test if the quantity of analyst coverage is related to quiet period earnings release, we use a multinomial logistic model.[20] The dependent variable is a count variable taking a value of one if there is one analyst initiation, two if there are two analyst initiations, three if there are three or more analyst initiations, and zero otherwise. For explanatory variables, we use a dummy variable taking a value of one if the IPO is backed by a venture capitalist and zero otherwise, a dummy variable taking a value of

[20] This regression follows the regression contained in Table IX of Bradley, Jordan and Ritter (2003) except that we use a different time period and omit two variables that they find to be insignificant: the market share of the underwriter and the turnover of the stock.

one if the IPO is Nasdaq listed and zero otherwise, the number of managers for the IPO offering[21], the market capitalization of the IPO, a technology dummy variable, the quiet period performance as measured by the stock return from the closing of the IPO offering day to three days prior to the quiet period expiration, and the underpricing of the IPO.

Regression results for the multinomial logistic model are contained in Table 2.8. We find results consistent with Bradley, Jordan, and Ritter (2003) for most of the control variables. We find a positive relationship between the number of analysts and whether or not a firm is backed by a venture capitalist. There is a positive relationship with the number of managing underwriters in the IPO syndicate and the number of analysts covering the firm. Further, larger firms and technology firms are more likely to attract analyst coverage. Finally, we find that firms with higher underpricing are less likely to attract analyst coverage. This last result contradicts earlier findings reported in Bradley, Jordan, and Ritter (2003). However, it should be pointed out that their results are for a later time period and their regressions using the time period from 1996-1998 show a negative (albeit insignificant) coefficient for underpricing. We therefore propose that there has been a regime shift in the relationship between underpricing and analyst coverage.

Finally, we test if firms releasing earnings during the quiet period are able to attract more analyst coverage. We include a dummy variable for quiet period earnings release in Model (2) of Table 2.8 and find that there is a positive and statistically significant relationship between the release of earnings during the quiet period and the number of analysts covering the firm. This result implies that quiet period earnings release is a good way for managers to attract analyst coverage of their firm.

2.6 Conclusions

We have shown that a subset of IPO firms release earnings during the quiet period through a press release rather than through the normal 10Q or 8K filing. These firms have no history of releasing earnings through press releases so the firm clearly has full discretion over when and how to release earnings. We test two hypotheses for why firms would release earnings during the quiet period. The Superior Performance Hypothesis states that firms releasing earnings during the quiet period will be releasing earnings news that exceeds the expectations of the market. The Market Timing Hypothesis says that managers consider firm operating performance when releasing earnings information, but also consider other factors such as their own stock performance or the overall market performance.

We show that consistent with the Superior Performance and the Market Timing Hypothesis, firms with better operating performance are more likely to release earnings during the quiet period. The market volatility also has a substantial ability to predict future earnings information release, consistent with the Market Timing Hypothesis. When we look at the earnings release stock returns, we see that returns are related to previous stock volatility, but not earnings performance. This result implies that the market responds favorably to an earnings release when the past IPO stock performance has been highly volatile, but not when the abnormal operating performance is better. This result contradicts the Superior Performance Hypothesis but is consistent with the Market Timing Hypothesis.

Ultimately, this study is interesting because it considers that managers may time their information release to benefit the firm the most. Managers appear to release earnings information when their firm performs well and when the overall stock market has a high volatility. The stock price response of the firm is related not to the operating performance of the firm, but to the previous stock price performance of the firm. Thus, it appears that managers release earnings strategically and the market knows that managers release earnings strategically. For the individual investor this is important because investors need to know what earnings information release means. It does not simply mean that firms have performed well, therefore, the manager wants to let the market know. It means that managers have a signal to send which is related to not only their operating performance, but also to the overall market conditions.

One question of importance is why the market would not value higher abnormal operating performance through higher abnormal returns. It may be that the ex post proxy we use for abnormal operating performance is not readily available in the market at the time of information release. This study back fills the quarterly performance of the IPO and the industry average quarterly performance to the time the IPO releases earnings. But obviously, this information is not yet public at the time of disclosure. Thus, it may be that the market cannot interpret the information release to know how good it is. But the market does know how volatile the firm is. Perhaps the market is only able to ascertain that the fact the firm is making a disclosure is good news and the higher the volatility of the firm, the better the news is at reducing information asymmetry.

Just as importantly, releasing earnings during the quiet period results in firms having more ability to attract analyst coverage. Analyst coverage ultimately serves to increase stock liquidity and reduce the cost of capital. As has been stated previously, 28% of the firms in this sample go through a subsequent equity offering within two years so the cost of capital for these firms is a real concern. In addition, we can see clearly that early information release unambiguously increases the coverage of firms by analysts. This is the result of one of two forces. Either analysis is costly and IPO firms can lower this cost by releasing more information, or IPOs firms can attract the attention of more analysts simply be disclosing more information.

APPENDIX B.

TABLES OF ESSAY 2.

Table 2.1
IPOs by their Release of Earnings during the Quiet Period

The sample is comprised of 2,075 IPOs reported in the Securities Data Corporation (SDC) New Issues database between 1993 and 1998. All REITs, unit offerings, closed-end funds, ADRs, firms not covered by CRSP, and IPOs with an offer price below $5 are removed from the sample. We use the Factiva database to identify whether the IPO firms release earnings information during the first 25 days that the firm is publicly traded (the quiet period) prior to releasing the information in a quarterly or annual filing. In the final sample, there are 1,943 firms that do not release earnings information during the quiet period and 132 firms that do release earnings information during the quiet period.

Panel A. Total number of IPOs by release of earnings during the quiet period	
Total Number of IPOs	2,075
IPOs not releasing earnings during the quiet period	1,943
IPOs releasing earnings during the quiet period	132

Panel B. Classification of IPOs by year and earnings release during the quiet period

Industry	No quiet period release		Quiet period release	
	N	Percent	N	Percent
1993	359	18.47	23	17.42
1994	283	14.56	3	2.27
1995	318	16.36	1	0.76
1996	462	23.77	50	37.88
1997	316	16.31	32	24.24
1998	205	10.55	23	17.42
Total	1,943	100	132	100

Table 2.1 (cont)

Panel C. Classification of IPOs by industry and earnings release during the quiet period				
Industry	No quiet period release		Quiet period release	
	N	Percent	N	Percent
Non-durables	79	4.06	4	3.03
Durables	68	3.50	5	3.79
Oil & Gas	36	1.85	1	0.76
Chemicals	99	5.09	3	2.27
Manufacturing	472	24.33	22	16.67
Telecommunications	85	4.37	10	7.58
Utilities	5	0.26	0	0.00
Wholesale Shops	681	35.03	59	44.70
Financial Industry	194	9.98	11	8.33
Other	224	11.52	17	12.88
Total	1,943	100	132	100

Table 2.2
IPOs Sample Characteristics

The sample is comprised of 2,075 IPOs reported in the Securities Data Corporation (SDC) New Issues database between 1993 and 1998. All REITs, unit offerings, closed-end funds, ADRs, firms not covered by CRSP, and IPOs with an offer price below $5 are removed from the sample. We use the Factiva database to identify whether the IPO firms release earnings information during the first 25 days that the firm is publicly traded (the quiet period) prior to releasing the information in a quarterly or annual filing. In the final sample, there are 1,943 firms that do not release earnings information during the quiet period and 132 firms that do release earnings information during the quiet period. *Underwriter rank* is based on the ranking system developed by Carter and Manaster (1990) as updated by Loughran and Ritter (2004). The ranking is based on the investment bank location in the prospectus with 9 being the highest ranking and 1 being the lowest ranking. *Revision* is the offer price minus the midpoint of the offer range divided by the midpoint of the offer range. Percent venture backed is the percentage of IPOs that are backed by a venture capitalist at the time of the IPO. *Underpricing* is the first day closing price minus the offer price divided by the offer price. *Percent of firms sued* is the percent of firms that have class action suits against them as reported in the Security Class Action Alert newsletter between January 1990 and August 2002. *IPO firm age* is the number of years from the founding of the firms until the IPO date. *Previous operating income* is the net income in the quarter that has not yet been released at the date of the initial public offering. *Previous total assets* is the total assets of the IPO firm in the quarter that has not yet been released at the time of the initial public offering. ***, **, and * denote that the differences are significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively.

Table 2.2

Average values for IPOs by whether or not the firm releases earnings information during the quiet period			
	No Quiet Period Release	Quiet Period Release	Difference (P-value)
Market capitalization ($ millions)	204	424	-219*** (0.00)
Shares offered (millions)	3.63	5.36	-1.74M*** (0.00)
Underwriter rank	6.95	7.53	-0.58*** (0.01)
Offer price ($)	12.07	13.27	-1.20*** (0.00)
Range low ($)	11.21	12.02	-0.81*** (0.00)
Range high ($)	12.98	13.97	-0.94*** (0.00)
Revision	-0.3%	1.08%	-1.39% (0.37)
Percent venture backed	37.8%	35.6%	2.15% (0.26)
Underpricing	15.7%	21.5%	-5.84%*** (0.01)
Percent of firms sued	3.65%	3.03%	0.06 (0.15)
IPO firm age (years)	13.3	13.4	-0.15 (0.46)
Previous operating income ($ millions)	6.05	7.14	1.09 (0.36)
Total assets ($ millions)	312.4	398.4	86.0 (0.37)

Table 2.3
Market Adjusted Mean Returns Around Earnings Releases

The sample is comprised of 2,075 IPOs reported in the Securities Data Corporation (SDC) New Issues database between 1993 and 1998. All REITs, unit offerings, closed-end funds, ADRs, firms not covered by CRSP, and IPOs with an offer price below $5 are removed from the sample. We use the Factiva database to identify whether the IPO firms release earnings information during the first 25 days that the firm is publicly traded (the quiet period) prior to releasing the information in a quarterly or annual filing. In the final sample, there are 1,943 firms that do not release earnings information during the quiet period and 132 firms that do release earnings information during the quiet period. *CAR for first 25 (5) days of trading* is the return of the IPO less the equally-weighted index for the first 25 calendar days (5 trading days) that the IPO is trading (the quiet period). *Volatility of excess returns for first 25 (5) days of trading* is the standard deviation for the IPO return less the equally-weighted index for the first 25 calendar days (5 trading days) that the IPO is trading. ***, **, and * denote that the values are significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: Excess returns for IPOs releasing earnings during the quiet period

Event window	Mean	t-test (P-value)	Median	Wilcoxon test (P-value)
AD-1	0.95%	2.21*** (0.01)	0.15%	1.78* (0.08)
AD	1.10%	2.38*** (0.01)	0.59%	2.56*** (0.01)
AD+1	0.11%	0.32 (0.37)	-0.22%	-0.26 (0.79)
AD-1 to AD	2.04%	2.94*** (0.00)	1.20%	3.65*** (0.00)
AD-1 to AD+1	2.16%	2.55*** (0.01)	0.97%	2.72*** (0.01)
AD-5 to AD+5	1.40%	1.15 (0.13)	2.13%	1.26 (0.21)

Panel B. Excess returns for IPOs for the first five and 25 days by whether or not the firm releases earnings information during the quiet period

	No quiet period earnings release	Quiet period earnings release	Difference (P-value)
CAR for first 25 days of trading	0.53%	1.46%	-0.93% (0.25)
CAR for first 5 days of trading	-0.06%	-0.15%	-0.08 (0.30)
Volatility of excess returns for first 25 days of trading	3.60%	3.93%	-0.35%* (0.07)
Volatility of excess returns for first 5 days of trading	3.51%	3.85%	-0.33%** (0.04)

Table 2.4
Logistic Regression Results with Quiet Period Earnings Release as the Dependent Variable

The sample is comprised of 2,073 IPOs reported in the Securities Data Corporation (SDC) New Issues database between 1993 and 1998 that do not release earnings prior to the sixth day of trading. We use the Factiva database to identify whether the IPO firms release earnings information during the first 25 days that the firm is publicly traded (the quiet period) prior to releasing the information in a quarterly or annual filing. The dependent variable is a dummy variable taking a value of one if the IPO firm releases earnings during the quiet period and zero otherwise. *Underpricing* is the first day closing price minus the offer price divided by the offer price. *Log(proceeds)* is the logarithm of the dollar value of IPO proceeds. *High underwriter* is a dummy variable taking on a value of one if the underwriter has a ranking of nine and zero otherwise. *Revision* is the offer price minus the midpoint of the offer range divided by the offer price. *Venture backed* is a dummy variable taking a value of one if the IPO is backed by a venture capitalist and zero otherwise. *Log(1+age)* is the logarithm of one plus the number of years from founding date to IPO date. *Market volatility* is the five day standard deviation for the value-weighted index starting at the IPO date. *Market return* is the five day return for the value-weighted index starting at the IPO date. *Technology dummy* is a dummy variable taking a value of one if the IPO is in the high technology sector. *IPO CAR* is the IPO return less the equally weighted index for the first five days the stock is publicly traded. *IPO volatility* is the standard deviation for the IPO return less the equally weighted index for the first five days the IPO is publicly traded. *Abnormal operating performance* is the IPO operating income in the quarter that has not yet been reported at the time of the IPO divided by the assets of the IPO minus the average operating income divided by assets for all firms matched to the IPO based on two digit SIC code. Each regression contains dummy variables for the IPO year. White heteroskedasticity consistent standard errors clustered by year are below the regression coefficients. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 2.4

Variable	(1)	(2)	(3)	(4)	(5)
Underpricing	0.558***	0.484***	0.569***	0.533***	0.554***
	(0.150)	(0.131)	(0.159)	(0.168)	(0.132)
Log(proceeds)	0.296***	0.283***	0.300***	0.312***	0.296***
	(0.082)	(0.092)	(0.080)	(0.081)	(0.080)
High Underwriter	0.057	0.048	0.062	0.057	0.056
	(0.263)	(0.268)	(0.270)	(0.270)	(0.271)
Revision	-0.359	-0.283	-0.387	-0.563	-0.357
	(0.579)	(0.566)	(0.541)	(0.730)	(0.590)
Venture backed	0.042	0.023	0.043	-0.020	0.042
	(0.324)	(0.334)	(0.328)	(0.293)	(0.323)
Market volatility		29.557**			
		(15.357)			
Market return			-8.503		
			(9.186)		
Technology dummy				0.486*	
				(0.298)	
IPO CAR					-0.731
					(5.670)
IPO volatility					
Abnormal operating Performance					
Sample Size	2,073	2,073	2,073	2,073	2,073
Pseudo R^2	0.0877	0.1008	0.0906	0.0917	0.0877

Table 2.4 (cont)

Variable	(6)	(7)	(8)	(9)
Underpricing	0.438*	0.371*	0.457*	0.242
	(0.239)	(0.206)	(0.256)	(0.292)
Log(proceeds)	0.310***	0.311***	0.325***	0.318***
	(0.072)	(0.083)	(0.059)	(0.081)
High Underwriter	0.062	0.049	-0.097	-0.119
	(0.269)	(0.289)	(0.199)	(0.220)
Revision	-0.389	-0.518	-0.727	-0.703
	(0.605)	(0.693)	(0.757)	(0.810)
Venture backed	0.020	-0.057	0.048	-0.010
	(0.303)	(0.293)	(0.411)	(0.385)
Market volatility		28.258**		29.946**
		(14.420)		(15.565)
Market return		-2.744		4.091
		(5.366)		(4.598)
Technology dummy		0.490**		0.262
		(0.232)		(0.180)
IPO CAR		-2.040		-4.891
		(4.091)		(4.072)
IPO volatility	3.627	2.583		2.726
	(4.177)	(3.180)		(3.210)
Abnormal operating Performance			0.576**	0.599**
			(0.289)	(0.273)
Sample Size	2,073	2,073	1,535	1,535
Pseudo R^2	0.0887	0.1058	0.0900	0.1043

Table 2.5
Multivariate Regression of Earnings Announcement Day Returns for IPO firms Releasing Earnings during the Quiet Period

The sample is comprised of 130 IPOs reported in the Securities Data Corporation (SDC) New Issues database between 1993 and 1998 that release earnings information during the first 25 days that the firm publicly trades, but not during the first five days the firm trades. The dependent variable is the sum of the IPOs return less the equally weighted index from five days before the earnings announcement to five days after the earnings announcement. *Underpricing* is the first day closing price minus the offer price divided by the offer price. *Log(proceeds)* is the logarithm of the dollar value of IPO proceeds. *High underwriter* is a dummy variable taking on a value of one if the underwriter has a ranking of nine and zero otherwise. *Revision* is the offer price minus the midpoint of the offer range divided by the offer price. *Venture backed* is a dummy variable taking a value of one if the IPO is backed by a venture capitalist and zero otherwise. *Log(1+age)* is the logarithm of one plus the number of years from founding date to IPO date. *Market volatility* is the five day standard deviation for the value-weighted index starting at the IPO date. *Market return* is the five day return for the value-weighted index starting at the IPO date. *Technology dummy* is a dummy variable taking a value of one if the IPO is in the high technology sector. *IPO CAR* is the IPO return less the equally weighted index for the first five days the stock is publicly traded. *IPO volatility* is the standard deviation for the IPO return less the equally weighted index for the first five days the IPO is publicly traded. *Abnormal operating performance* is the IPO operating income in the quarter that has not yet been reported at the time of the IPO divided by the assets of the IPO minus the average operating income divided by assets for all firms matched to the IPO based on two digit SIC code. Each regression contains dummy variables for the IPO year. White heteroskedasticity consistent standard errors clustered by year are below the regression coefficients. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 2.5

Variable	(1)	(2)	(3)	(4)	(5)
Underpricing	-0.062**	-0.061**	-0.065**	-0.062**	-0.056*
	(0.017)	(0.017)	(0.018)	(0.019)	(0.025)
Log(proceeds)	0.009	0.009	0.011	0.007	0.008
	(0.006)	(0.007)	(0.008)	(0.007)	(0.007)
High Underwriter	-0.023	-0.022	-0.023	-0.020	-0.018
	(0.024)	(0.025)	(0.022)	(0.023)	(0.019)
Revision	0.059	0.061	0.062	0.066	0.058
	(0.065)	(0.061)	(0.065)	(0.074)	(0.062)
Venture backed	0.029	0.028	0.028	0.032	0.026
	(0.025)	(0.024)	(0.025)	(0.021)	(0.028)
Market volatility		-0.291			
		(0.863)			
Market return			0.672		
			(0.523)		
Technology dummy				-0.027	
				(0.021)	
IPO CAR					0.843
					(1.075)
IPO volatility					
Abnormal operating Performance					
Sample Size	130	130	130	130	130
Adjusted R^2	0.0210	0.0134	0.0222	0.0188	0.0225

Table 2.5 (cont)

Variable	(6)	(7)	(8)	(9)
Underpricing	-0.110***	-0.115**	-0.064***	-0.127**
	(0.022)	(0.037)	(0.014)	(0.034)
Log(proceeds)	0.020**	0.021*	0.006	0.018**
	(0.006)	(0.009)	(0.009)	(0.005)
High Underwriter	-0.033	-0.028	-0.017	-0.032
	(0.019)	(0.018)	(0.035)	(0.034)
Revision	0.076	0.093	0.051	0.102
	(0.059)	(0.061)	(0.125)	(0.120)
Venture backed	0.019	0.022	0.036	0.036
	(0.027)	(0.024)	(0.023)	(0.021)
Market volatility		-0.640		-0.418
		(0.319)		(0.509)
Market return		0.547		0.785
		(0.492)		(0.397)
Technology dummy		-0.041*		-0.057*
		(0.018)		(0.025)
IPO CAR		0.097		-0.836
		(0.768)		(0.872)
IPO volatility	1.499***	1.593**		1.546*
	(0.304)	(0.477)		(0.658)
Abnormal operating Performance			0.027	0.048
			(0.042)	(0.093)
Sample Size	130	130	99	99
Adjusted R^2	0.0685	0.0596	0.0225	0.0380

Table 2.6
Summary Statistics for Analyst Coverage

The sample is comprised of 2,075 IPOs reported in the Securities Data Corporation (SDC) New Issues database between 1993 and 1998. We use the Factiva database to identify whether the IPO firms release earnings information during the first 25 days that the firm is publicly traded (the quiet period) prior to releasing the information in a quarterly or annual filing. We then use the IBES database to determine the analyst coverage for each firm for the first 90 days that the IPO is publicly traded. Panel A contains information about the overall distribution of initiations by analysts. There are 1,347 IPOs that receive analyst initiation and 728 that do not. There are a total of 3,230 analyst recommendations in the sample. Panel B. gives detailed information about the number of analysts giving strong buy, buy, etc ratings for the stocks. Panel C. shows the average rating for firms that do not release earnings during the quiet period and firms that do release earnings during the quiet period. Consistent with IBES, we code a strong buy as 1, a buy as 2, a hold as 3, a sell as 4, and a strong sell as 5. ***, **, and * denote that the differences are significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A. Number of analysts initiating coverage

Number of analysts	No quiet period release		Quiet period release	
	N	Percent	N	Percent
0	702	36.1	26	19.7
1	286	14.7	14	10.6
2	511	26.3	35	26.5
3	260	13.4	35	26.5
4	118	6.1	16	12.1
5	40	2.0	4	3.0
>5	26	1.3	2	1.5
Total	1,943	100	132	100

Panel B. Analyst recommendations

Recommendation	No quiet period release		Quiet period release	
	N	Percent	N	Percent
Strong Buy	1,538	52.2	158	55.2
Buy	1,255	42.6	120	42.0
Hold	141	4.8	8	2.8
Sell	2	0.1	0	0
Strong Sell	8	0.3	0	0
Total	2,944	100	286	100

Table 2.6 (cont)

Panel C. Analyst recommendations			
	No quiet period release	Quiet period release	Difference (P-value)
Average recommendation level conditional on analyst coverage	1.53	1.48	0.06* (0.06)
N	2,944	286	

Table 2.7
Logistic Regression Results with Analyst Coverage as the Dependent Variable

The sample is comprised of 2,075 IPOs reported in the Securities Data Corporation (SDC) New Issues database between 1993 and 1998. In Panel A. the dependent variable is a dummy variable that equals one if the underwriter provides analyst coverage within the first 90 days of trading for the stock and zero otherwise. In Panel B. the dependent variable is a dummy variable that equals one if any analyst provides coverage within the first 90 days of trading for the stock and zero otherwise. *Venture backed* is a dummy variable taking a value of one if the IPO is backed by a venture capitalist and zero otherwise. *Nasdaq listed* is a dummy variable taking a value of one if the issue is NASDAQ listed and zero otherwise. *High rank underwriter* takes a value of one if the underwriter has a ranking of 9 and zero otherwise. *Number of managing underwriters* is a count variable for the number of managing underwriters in the IPO. *Technology dummy* is a dummy variable taking a value of one if the IPO is in the high technology sector. *Quiet period performance* is the return of the stock from the closing price on the IPO day until three days prior to the end of the quiet period. *Underpricing* is the first day closing price minus the offer price divided by the offer price. *Quiet period release* is a dummy variable taking a value of one if the IPO released earnings information during the quiet period and zero otherwise. Each regression contains dummy variables for the IPO year. White heteroskedasticity consistent standard errors clustered by year are below the regression coefficients. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A. Dependent variable is underwriter analyst coverage		
Variable	(1)	(2)
Venture backed	0.021	0.022
	(0.150)	(0.151)
Nasdaq listed	0.771***	0.769***
	(0.295)	(0.295)
High rank underwriter	-0.297	-0.298
	(0.267)	(0.268)
Number of managing underwriters	0.026	0.026
	(0.026)	(0.026)
Log market capitalization	0.221**	0.220*
	(0.112)	(0.113)
Technology dummy	0.141	0.139
	(0.164)	(0.162)
Quiet period performance	0.096	0.097
	(0.435)	(0.439)
Underpricing	-0.663	-0.662
	(0.404)	(0.403)
Quiet period release		0.059
		(0.102)
N	2,075	2,075
Pseudo R^2	0.0232	0.0232

Table 2.7 (cont)

Panel B. Dependent variable is analyst coverage		
Variable	(1)	(2)
Venture backed	0.366***	0.369***
	(0.067)	(0.067)
Nasdaq listed	0.173	0.168
	(0.190)	(0.196)
High rank underwriter	-0.145	-0.150
	(0.191)	(0.186)
Number of managing underwriters	0.063*	0.062*
	(0.038)	(0.037)
Log market capitalization	0.565***	0.561***
	(0.085)	(0.084)
Technology dummy	-0.107	-0.120
	(0.087)	(0.088)
Quiet period performance	-0.343	-0.341
	(0.275)	(0.253)
Underpricing	-0.498	-0.507
	(0.371)	(0.337)
Quiet period release		0.407**
		(0.188)
N	2,075	2,075
Pseudo R^2	0.1394	0.1408

Table 2.8
Multinomial Logistic Regression Results with Analyst Coverage as the Dependent Variable

The sample is comprised of 2,075 IPOs reported in the Securities Data Corporation (SDC) New Issues database between 1993 and 1998. The dependent variable is a multilevel variable that equals one if coverage is initiated by one analyst, two if coverage is initiated by two analysts, three if coverage is initiated by more than two analysts, and zero otherwise. *Venture backed* is a dummy variable taking a value of one if the IPO is backed by a venture capitalist and zero otherwise. *Nasdaq listed* is a dummy variable taking a value of one if the issue is NASDAQ listed and zero otherwise. *High rank underwriter* takes a value of one if the underwriter has a ranking of 9 and zero otherwise. *Number of managing underwriters* is a count variable for the number of managing underwriters in the IPO. *Technology dummy* is a dummy variable taking a value of one if the IPO is in the high technology sector. *Quiet period performance* is the return of the stock from the closing price on the IPO day until three days prior to the end of the quiet period. *Underpricing* is the first day closing price minus the offer price divided by the offer price. *Quiet period release* is a dummy variable taking a value of one if the IPO released earnings information during the quiet period and zero otherwise. Each regression contains dummy variables for the IPO year. White heteroskedasticity consistent standard errors clustered by year are below the regression coefficients. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Variable	(1)	(2)
Venture backed	0.374***	0.383***
	(0.081)	(0.084)
Nasdaq listed	0.155	0.143
	(0.116)	(0.126)
High rank underwriter	-0.065	-0.073
	(0.107)	(0.112)
Number of managing underwriters	0.083***	0.081***
	(0.017)	(0.016)
Log market capitalization	0.619***	0.613***
	(0.052)	(0.052)
Technology dummy	0.106**	0.070
	(0.048)	(0.063)
Quiet period performance	-0.107	-0.088
	(0.342)	(0.277)
Underpricing	-0.525**	-0.540**
	(0.253)	(0.213)
Quiet period release		0.815***
		(0.203)
N	2,075	2,075
Pseudo R^2	0.1040	0.1045

ESSAY 3. THE EFFECT OF NEWS ON VOLATILITY: A STUDY OF IPOS

3.1 Introduction

We analyze the hypothesis that a greater number of news announcements contributes to greater return volatility. More news presents investors with a larger information set, and the processing of this information set can increase volatility. Campbell, Lettau, Malkiel, and Xu (2001, hereafter CLMX) were the first to show that average firm-level volatility more than doubled over the last four decades while market volatility remained constant. A subsequent paper by Wei and Zhang (2003) provides evidence that the upward trend in idiosyncratic volatility is strongest for newly listed firms. We find that the rising trend in volatility for initial public offerings (IPOs) is accompanied by a similarly increasing trend in news citations. For example, keeping the number of news sources constant, the average IPO in its first five years of trading had 23 news citations in the 1970s, 72 in the 1980s, and 202 in the 1990s. In contrast, firms matched to the IPOs based on size and book-to-market had an average of 23 citations in the 1970s, 57 in the 1980s, and 77 in the 1990s.

We confirm an increase in idiosyncratic IPO volatility over the period from 1973 through 2003. The increase in volatility is over two times as large for IPOs as for matching firms. Next, we form a hand-collected database of 129,737 public news disclosure announcements for IPOs and a set of matching firms. Analyzing our news database, we provide information on the distribution of news-day returns for both samples. The number of news citations per IPO has risen sharply over the last three decades, and the reaction to news has become significantly larger for IPOs than for matching firms. Our final contribution presents evidence that, for both IPOs and matching firms, the increased idiosyncratic volatility over time is significantly related to an increase in news in recent decades. We conclude that the reason IPOs show the strongest increase in idiosyncratic volatility over time is driven at least in part by the fact that they have more news.

There are many reasons to study not only total volatility, but idiosyncratic volatility as well. CLMX (2001) argue that effective diversification depends on knowledge of the idiosyncratic volatility of firms in the portfolio. They also point out that arbitrageurs who attempt to exploit mispricing in stocks face risks related to firm-specific volatility rather than total market volatility. Our study is the first to focus exclusively on the idiosyncratic volatility of IPOs. We believe this is an important area of research, as IPOs appear to show the strongest increase in idiosyncratic volatility over time. Since IPOs are relatively young firms without a history of publicly available information, the effect of news on IPO volatility could be larger than that for other (non-IPO) firms. IPOs are also particularly interesting due to the high level of apparent mispricing for these firms in the marketplace. Research concerning the limitations to arbitrage, such as short sales constraints, make the study of IPO idiosyncratic risk particularly important [see Schleifer and Vishny (1997) and Ljungqvist, Nanda, and Singh (2003)].

First, we confirm the rise in idiosyncratic IPO volatility across decades. For IPOs issued in the 1970s, the average monthly idiosyncratic standard deviation of returns over the first five years of trading is 12%. For IPOs issued in the 1990s, the standard deviation rises to 21%. A matching firm sample shows a rise in idiosyncratic standard deviation from 14% to 18% over the same period, an increase less than half that of IPOs.

To our knowledge, there are only a few papers that try to explain the rise in idiosyncratic volatility documented by CLMX (2001). While not directly testing these theories, CLMX (2001) do postulate that such factors as corporate governance, companies going public earlier in their life cycle, and financial innovation may all contribute to increased firm volatility. Wei and Zhang (2003) present evidence that corporate earnings and return-on-equity (ROE) have become more volatile over time, especially for newly listed firms. This is consistent with the findings of Fama and French (2003) that in recent years, newly listed firms have had lower profits and higher growth rates than in the past. Wei and Zhang (2003) also provide evidence of an inverse link between ROE and idiosyncratic volatility. Xu and Malkiel (2003) show a positive relation between institutional ownership and firm volatility, and Pastor and Veronesi (2003) examine the link between return volatility and firm profitability. Whenever possible, we control in our own empirical tests for the variables these studies have found to impact idiosyncratic volatility.

While the focus of our paper is on idiosyncratic firm news and volatility, there are several theoretical and empirical studies of market news and its effect on market volatility. For instance, Cutler, Poterba, and Summers (1989) find that macroeconomic news can explain approximately one-third of the variation in Standard and Poor's Composite Index returns. Mitchell and Mulherin (1994) find a direct relation between aggregate market volatility and the occurrence of Dow Jones news stories. Klibanoff, Lamont, and Wizman (1998) show that closed-end country funds exhibit higher return volatility during weeks with increased country-specific news. Only Roll (1988) tracks public, firm-specific news events in his test of the CAPM and APT pricing models. However, his results indicate that news is not driving a substantial portion of firm volatility.

While the literature has demonstrated a link between market news and market volatility, empirical evidence has not documented a positive relationship between firm news and firm volatility. As discussed in CLMX (2001), cash flow news is less correlated across firms implying that idiosyncratic volatility is more likely to be caused by cash flow news and market volatility is more likely to be caused by discount rate news. Therefore, the news we examine in this study is likely cash flow as opposed to discount rate news [see Vuolteenaho (2002) for a further discussion of cash flow and discount rate news]. In a constant discount rate framework, improved information about future cash flows will result in a *decrease* in firm return volatility. This is the result of news arriving sooner, when these uncertain cash flows are discounted at a higher rate. Thus, it is not clear that an increase in firm-level news should result in increased firm volatility. Our results are unique in that they definitively show that the firm-specific news we document results in an increase in firm level volatility.

Since our goal is to understand changes in firm-specific volatility, we focus on firm-level news as measured by the number of cites in the Factiva® database of newswire and newspaper publications. With this method, we avoid choosing specific announcements that ex-post have been shown to influence returns. Recent papers use the number of firm news cites in either Factiva or Lexis/Nexus as a measure of news flow, although they do not study the link between news and volatility [See Chan(2003), Demers and Lewellen (2003), and Reese (2003)]. For each year, we randomly select 10% of the firms that go through IPOs. We collect the number of Factiva cites for the IPO subsample and a matching firm sample over the first five years that the IPO trades. Across decades, the number of cites over the first five years of trading increases for both IPOs and the matching firm sample. The number of news cites is approximately equal for IPOs and matching firms in the 1970s, but in the 1990s the IPOs have almost three times as many news citations as the matching firms.

Next we turn to investor reaction on news days. We build on prior research in the news area in that not only do we calculate the number of news announcements for each IPO, we also record every date that a news report is published in the first five years of trading. This allows us to track investor reaction to news announcements over time, and we believe we are the first to create such a comprehensive database of news affecting IPOs. The reaction to news is more pronounced for IPO firms compared to matching firms. In keeping with Chan (2003) and Engle and Ng (1993) we define "good" news days as days with Factiva cites and positive abnormal daily returns. The average return on good news days increases significantly for IPOs from 3% in the 1970s to 5% in the 1990s. The average return on bad news days decreases for IPOs from -2% in the 1970s to -4% in the 1990s. The matching firm reaction on good and bad news days remains relatively flat across decades. The standard deviation of returns on news days also increases over decades, with IPOs again showing a larger increase than for matching firms.

We show in a regression framework that the number of news hits each month has a significant impact on monthly IPO and matching firm idiosyncratic volatility. An increase of just one extra news day each month leads to an additional 0.6% in monthly standard deviation of returns for IPO and matching firms, or 2.1% per year. With average monthly volatility in the range of 17% to 19% for IPOs and matching firms, a 0.6% addition to monthly volatility from just one extra news day is also economically significant. These regressions tell us IPOs show more volatility than non-IPOs in part because they have more news. In each regression, we make sure to control for several variables that are known contributors to future volatility such as size and lagged volatility. We also find that the increase in idiosyncratic volatility for both IPOs and matching firms is Granger-caused by the increase in news.

Finally, we look at exogenous events that would cause an increase in the amount of news that firms release. Utilizing exogenous events affecting news allows us to definitively determine causality for the news-volatility relationship. We document that these exogenous shocks to news correspond to an increase in both news and volatility. Such a link allows us to rule out the cases of volatility driving news or a third common factor driving both news and volatility.

The remainder of the paper is organized as follows. Section I describes our IPO firm sample and the technique for finding matching firms. Section II documents the increase in idiosyncratic IPO volatility over time. Section III examines the relation between news flow and volatility for both IPO and matching firms. Section IV investigates the robustness of our Factiva sample. We include a discussion of exogenous shocks to news in Section V. In the paper's last section, we offer conclusions and implications of our findings.

3.2 IPO and Matching Firm Sample

Our data source for IPOs from 1973 through 1998 is the Securities Data Company (SDC) new issues database. Stock return information is collected from the Center for Research in Security Prices (CRSP). Firms must meet criteria as follows. The IPOs must have an offer price of at least $5 per share. Unit offerings, closed-end funds, Real Estate Investment Trusts (REITs), partnerships, non-U.S. operating companies (as defined by CRSP), utilities (three-digit SIC codes 491-494), and American Depository Receipts (ADRs) are excluded from the sample universe. Our final sample includes 5,955 IPOs.

To form a matching sample for the IPO firms, we select a methodology that will match on sample firm characteristics while avoiding look-ahead biases and/or contamination problems. Matching firms must be listed on CRSP for at least five years. Each year from 1972 to 1998, we form size quintiles according to the June market capitalizations of firms listed on the New York Stock Exchange (NYSE). On a yearly basis, book-to-market (B/M) quintiles using NYSE, Amex, and Nasdaq firms are then formed inside each size quintile. The book values are taken from Compustat as of December of the preceding year.

For every IPO in our sample, we select a matching firm with the closest size and B/M values in the (July to June) year of the IPO. If no B/M value is available for the new issue firm, we choose the matching firm on the basis of size only.[22] For IPO firms without a reported book value in Compustat, we use the post-offering book value if it is available from SDC.

[22] Due to missing book values, 836 (of 5,955) IPOs are matched only on the basis of size.

A matching firm may be chosen only once every year. The matching firm's volatility is calculated over the same time period as the particular IPO firm. If the matching firm does not have the full post-measurement period of returns, another matching firm is spliced in to continue where the first matching firm's returns stop. About 71% of the IPO sample needs only a single matching firm, while about 25% needs two matching firms.

3.3 IPO volatility

We calculate the monthly idiosyncratic volatility of IPOs and their matching firms over the first five years that the IPOs publicly trade. Each month, we calculate the volatilities for all firms that are within five years of their IPO date. Separately, we also calculate volatilities of firms that are matched with each IPO. We follow CLMX (2001) for our calculation procedures. We start measuring volatilities in the first full month after the offering date. Using daily returns from CRSP, we calculate the monthly idiosyncratic volatility of a firm as the sum of the daily squared differences between the firm returns and the value-weighted index returns. Thus, monthly firm idiosyncratic volatility is:

$$\sigma_{monthly} = \sqrt{\sum_{t=1}^{T} (R_{firm} - R_{VWindex})^2} \quad (1)$$

where T is the number of days in the month, R_{firm} is the one-day firm return and $R_{VWindex}$ is the one-day value-weighted index return. The volatility average is then calculated two ways: equal weighting and value weighting. The equally weighted volatilities are averaged across all months and all firms. The value-weighted volatilities are found by value weighting across all sample firms within each month and then averaging equally across all months. We also calculate the equally weighted (EW) and value-weighted (VW) monthly index volatilities by summing the squared daily returns over the month. Thus, the index volatility becomes:

$$\sigma_{monthly} = \sqrt{\sum_{t=1}^{T} (R_{index})^2} \qquad (2)$$

where T is the number of days in the month and R_{index} is the one-day return for either the value-weighted or equally weighted CRSP stock index.

Table 3.1 contains the monthly idiosyncratic volatility results for the IPOs, the matching firms, the EW index, and the VW index. This table shows that there has been a dramatic increase in idiosyncratic volatility for IPO firms over the last few decades, rising from 12% in the 1970s to 21% in the 1990s for the equal-weighted measure. Although firms matched to the IPOs based on book-to-market and size also show an increase in volatility, the difference is much smaller (only rising from 14% to 18%). The value-weighted volatilities are lower than the equal weighted measures, but the increase for IPOs is still almost three times as large as that for matching firms. Consistent with CLMX (2001), the value-weighted and equally weighted indices are essentially flat across decades. Figure 3.1 shows the idiosyncratic firm volatility over time for IPOs and matching firms.

Also contained in Table 3.1 is the pooled daily return kurtosis for the IPOs, the matching firms, the VW index, and the EW index.[23] The reported kurtosis figures are

[23] The VW index and EW index values do not contain returns for October 14-October 26, 1987. With all daily returns for the 1980s decade, the VW index kurtosis goes from 6.4 to 48.8 and the EW index kurtosis goes from 11.1 to 40.7. The daily returns around the date of October 19, 1987 have a limited affect on the kurtosis of the IPOs and matching firms.

from equally weighted returns across all firms and all months. Note that like volatility, the kurtosis of daily returns for IPOs and matching firms is monotonically increasing across decades. For IPOs, the kurtosis goes from 45 in the 1970s to 125 in the 1980s to 360 in the 1990s. The fourth moment of returns is important because it allows us to discriminate between the same news being broken into smaller pieces and a fundamentally different kind of news. The monotonically increasing kurtosis values given in Table 3.1 contradict the idea that the same amount of news is released across decades but the news in the 1990s is released in smaller pieces.

3.4 News Flow and Volatility

3.4.1 News measurement

We wish to study the effect of news on the returns and volatility of firms, and thus we require a method to track news flows. We use the Factiva database of newspaper, newswire, and periodical publications from Dow Jones & Reuters to find when information becomes available to investors. The overall spirit of our news collection using Factiva which we describe below is similar to Chan (2003), Demers and Lewellen (2003), and Reese (2003).

Rather than searching over all sources available in the Factiva database, we choose newspaper and newswire sources we consider most poignant to the vast majority of investors. We also wish to keep our number of news sources as constant as possible across decades. Our selection criteria are as follows: the top six U.S. newspapers by circulation with Factiva listings going back to at least 1987, the two newswires with longest data availability, the top two Canadian newspapers by circulation and the top British business newspaper by circulation. Table 3.2 contains the news sources we utilize along with their date of availability in the Factiva database.

In our collection process, we record a dummy variable that takes on a value of one if the citation comes from the New York Times Abstracts, two if the source is The Wall Street Journal or the Dow Jones Newswire, and zero otherwise. These are the U.S. news sources with the longest data availability. This allows us to later conduct robustness checks using news sources available over the whole time period versus our extended database where some sources are not available until the early to mid-1980s.

Our IPO sample consists of 5,955 IPOs from 1973 to 1998. Collecting the date of every IPO news article over the first five years of trading is very labor intensive. To make the process more manageable, we randomly select 10% of the firms that went through IPOs in each year from 1973 through 1998 along with their matching firms.[24] When multiple matching firms are used over the five-year period, the Factiva search is spliced the same way the returns would be spliced in for the new matching firm. This provides us with data for a total of 609 IPOs and 818 matching firms. We have a very large sample of daily news returns consisting of 88,577 total cites for IPO firms and 41,160 total cites for matching firms.[25]

For our search in Factiva, we use the company name as given by the CRSP database. For IPOs, the search is done from the IPO date until five years after the IPO

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[24] We see no significant differences in monthly volatility for our Factiva sample of IPOs versus the IPOs for which we do not collect news. Our IPO news sample has a monthly volatility of 19.0%, the same as the IPO sample with no news collected. For the corresponding matching firms, we calculate volatilities of 16.2% for those firms matched to the news IPOs, and 16.9% for the firms matched to the IPOs without news collected.

[25] These results include redundant hits, i.e., citations on the same day in multiple news sources. Some firms had as many as 36 hits in various publications on a single day.

date plus the next full calendar month or until the stock is delisted. For matching firms, the search is performed until another matching firm is chosen, until the IPO firm is delisted, or until five years after the IPO date plus one calendar month. For every citation in Factiva, the date of the citation and a flag for its source is recorded.

As an example of the data we collect, Bear Creek Corporation has 19 days with hits from its IPO in 1976 through our five-year measurement period ending in 1981. Roadhouse Grill has 55 days with hits from its IPO in 1996 until 2001. In the 1970s, only 1.5% of trading days in the first five years have news hits; this percentage increases to 4.4% in the 1980s and 8.4% in the 1990s.

Table 3.3 contains the results of our data collection. The table contains the number of *citations* (including multiple hits on each day) and the number of news *days* (with multiple hits purged from the sample).[26] The percentage of news days with multiple news citations goes from 6% in the 1970s to 18% in the 1980s to 46% in the 1990s. From this point on in the paper, when we refer to news citations, we are using this term synonymously with days on which there is news released about a firm. Paring our sample down in this way reduces our data set to 53,166 news citations for the IPOs and 30,500 news citations for the matching firms.

Several comments can be made about news citations for IPOs and matching firms based on Table 3.3. First, it is clear that both in terms of raw number of hits and in terms of non-redundant citations, the IPOs have increasing news coverage across decades. IPOs go from 19 news days to 105 news days over five years in the 1970s and the 1990s,

[26] Three firms account for 14.4% of the total number of hits. All were firms that went public in the late 1990s. Amazon.com has 5176 hits, CIENA has 4467 hits, and Verisign has 3116 hits. Excluding the hits for these three companies, the 1990-1998 mean hits per firm is 166.9 and the 1973-1998 mean hits per firm is 125.5.

respectively. This trend is only marginally shared by the matching firms. It is also clear that the IPOs are receiving more news coverage in all time periods when compared to firms matched on size and book-to-market. For instance, in the 1990s, IPOs have 105 news days over five years whereas matching firms have 52 news days.

Once news dates are generated for all the firms in our sample, returns on the news dates and no-news dates are obtained from the CRSP database.[27] Following Chan (2003) and Engle and Ng (1993) we then categorize returns as good or bad according to whether the daily return was positive or negative on the news day. We also separate returns across decades. The results of this tabulation are given in Table 3.4 Panel A.

The table shows the dramatic change in news day return distributions, particularly for IPOs. Going from the decade of the 1970s to the 1990s, we see a change in mean IPO news day returns from 0.15% to 0.39%. The returns on no-news days show no clear trend for either IPOs or matching firms. Separating out good news from bad news, the average returns on good news days are increasing while the average returns on bad news days are decreasing. A piece of good IPO news in the 1970s produces a 2.7% daily return while that return grows to 4.9% for a piece of good news in the 1990s. Similarly, bad news returns start at -2.3% for IPOs in the 1970s and drops to -4.2% in the 1990s.[28] The daily good news returns and bad news returns for matching firms remain relatively flat across time.

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[27] We do not include the returns for the stock on the first day of trading.

[28] It is possible that a news item could be reported by the Associated Press newswire after 4:00 p.m. on one day, and the same story reported in a print newspaper the next day. In our methodology, we would record this as two news days instead of one. However, this type of event would actually bias against our results. We would record the stock return associated with the Associated Press newswire as a valid "news day" return. The market would not yet have been able to process this information though, given a 4:00 p.m. close. Additionally, one would need to argue that this type of event has a time trend – i.e.) it occurs more frequently in the 1990s than in the 1980s.

We also see in Table 3.4 that the standard deviation of daily returns increases across decades. This is true for both news and non-news days. For example, the standard deviation of IPO daily returns increases from 4.1% in the 1970s to 8.1% in the 1990s. The matching firms have relatively stable values across the 1970s and 1990s, with a lower standard deviation in the 1980s.

It is also important to note that there is no increase in the percentage of bad news. Although the number of events is increasing substantially over time, the news spread is consistently about half good news and half bad news. Thus, it is clear that the increase in volatility is not coming as a result of more bad news being released in recent decades.

Panel B of Table 3.4 includes an analysis showing the significance of the changes in news day returns and volatilities. To control for the fact that both the return means and standard deviations are changing across decades, we use a regression framework to test for statistically significant differences across decades. The base year is the 1980s allowing us to test for changes from the 1970s to the 1980s and from the 1980s to the 1990s. We regress daily returns onto dummy variables for time, whether or not the firm is an IPO, and the requisite cross dummy variables. The regression equation for regression (I) in the table is as follows:

$$\begin{aligned} Return_t = {} & b_0 + b_1\, 1970s\ Dum + b_2\, 1990s\ Dum + b_3\, IPO\ Dum + \\ & b_4\, IPO\ Dum * 1970s\ Dum + b_5\, IPO\ Dum * 1990s\ Dum + e_t \quad (3) \end{aligned}$$

All t-statistics are heteroskedasticity-consistent and are given in parentheses.

These results are shown in the first row of Table 3.4 Panel B. Note that the news day returns are approximately 0.3% across all time periods with no difference between IPOs and matching firms. We find no significant difference between 1970s news day returns and 1980 news day returns but we find that news day returns became more positive (by 0.2%) in the 1990s for all firms. The fact that an IPO was issued in any particular decade has no significance for the news day returns.

Once coefficients from this first regression are available, we can use them to calculate a set of squared residuals. These squared residuals are then regressed onto the same variables per the equation below used in regression (II).

$$\hat{u}^2_t = b_0 + b_1\, 1970s\ Dum + b_2\, 1990s\ Dum + b_3\, IPO\ Dum\ +$$

$$b_4\, IPO\ Dum * 1970s\ Dum + b_5\, IPO\ Dum * 1990s\ Dum + e_t \qquad (4)$$

The second regression allows us to test which variables are driving increases in volatility on news days. The volatility going from the 1970s to the 1980s does not change significantly. However, moving from the 1980s to the 1990s causes a doubling of the volatility on news days. The fact that news is about an IPO versus a matching firm also implies a higher volatility.

An interesting finding from regression (II) deals with the cross effects dummy for the 1970s Dum * IPO Dum. The fact that this particular coefficient is negative and statistically significant indicates that going from the 1970s to the 1980s, IPOs became much more volatile on news days. This is consistent with the proposition by Fama and French (2003) and CLMX (2001) that IPOs are going public earlier in their lifecycles resulting in higher volatility. If cash flows are pushed out farther into the future for firms listing in the 1980s compared to firms listing in the 1970s, then for equivalent news releases, the news day volatility will be much higher in the 1980s. However, regression

(II) also shows clearly that there is no change in news day volatility for IPOs when moving from the 1980s to the 1990s. These results are consistent with firms going public earlier in their lifecycles in the 1980s and 1990s when compared to the 1970s, but inconsistent with a shift from the 1980s to the 1990s. The positive and highly significant 1990s Dum coefficient implies that all firms were becoming more volatile in the 1990s, not only IPOs. Thus we see that while IPOs going public earlier in their lifecycle might have caused some of the increase in volatility going from the 1970s to the 1980s, any volatility increase thereafter appears to be affecting both IPOs and non-IPOs.

Figure 3.2 shows the news day return distributions of IPOs for the 1970s, 1980s, and 1990s. The distributions appear to be a mean preserving spread across decades; the increase in volatility is easily observable from this figure.

3.4.2 Estimating the relationship between news and idiosyncratic volatility

Now that we have documented the rise in news citations and the rise in volatility over the last few decades, we turn our focus to estimating the relationship between publicly reported news and idiosyncratic volatility. First, we identify variables known to influence volatility. We control for lagged volatility, because volatility is known to be an autocorrelated series. Based on arguments in Duffee (1995) that risk and return are contemporaneously correlated, we also include a monthly return variable. Wei and Zhang (2003) and Pastor and Veronesi (2003) provide evidence that firm profitability or return on equity (ROE) has a significant influence on volatility. In addition to controlling for ROE, we also include variables for leverage, size, and book-to-market (B/M). In theory, more highly levered firms should have a higher probability of financial distress, which could lead to more volatile returns. Size and book-to-market have been identified by Fama and French (1992) as significant factors affecting expected returns.

Fama and French (2003) conjecture that an increasing dispersion in profitability and growth rates for IPOs may explain the increase in idiosyncratic volatility documented by CLMX (2001). Their proxy for profitability is return on assets, and their proxy for growth is change in assets. Most IPOs have little debt, so we believe our use of ROE would pick up profitability in essentially the same manner as return on assets. Also, many IPOs have few tangible assets. As such, using a variable such as B/M may be a better proxy for growth than change in assets.

Since our focus is on IPO volatility, we have also included a control variable that may be important for IPOs. We use the technology and Internet industry classifications from Appendix 4 of Loughran and Ritter (2004) to form a tech dummy variable. This variable takes on a value one (zero otherwise) if the IPO or matching firm is classified as a tech or internet stock at the time of its IPO.

All accounting data are pulled from the annual Compustat database. The previous fiscal year's financial statements are matched with the current month's return, allowing for a six-month window at the end of each firm's fiscal year. This ensures that all data are publicly available to investors.

The variables are formed as follows. We continue to use the monthly measure of idiosyncratic volatility (St. Dev_t) formed from daily returns as in CLMX (2001). We use the equal weighted measure in order to explore cross-sectional implications that would not be possible with the value-weighted measure. We also cumulate daily excess returns to form a monthly return measure ($Return_t$). The monthly market capitalization variable

($Mkt. Cap_{t-1}$) uses the previous month's market value (price times shares outstanding). We cumulate the number of days with news citations each month to form a monthly hits variable ($Hits_t$). Leverage is defined as the ratio of last fiscal year's long-term debt to last fiscal year's total assets (Lev_{t-1}). ROE is the prior year's net income divided by the prior year's book value (ROE_{t-1}). Book-to-market uses the prior year's book value and divides by the prior month's market value (B/M_{t-1}).[29]

Table 3.5 provides summary statistics of the control variables for both IPOs and matching firms. These are monthly averages across the first five years that the IPO trades. Panel A shows that the size of the IPOs ($307 million) is slightly larger than that of matching firms ($291 million). Our size and book-to-market matching firm technique matches firms only once – at the date of the IPO. Since the table shows an average of our monthly variables across the first five years the IPO trades, it is possible that our size and book-to-market variables will differ over that period. IPOs show a book-to-market ratio of 0.67 with matching firms tilted slightly more towards a value-type ratio at 1.18. More IPOs come from the tech industry than do the matching firms (14% versus 8%). Finally, the leverage ratios are approximately the same for each sample at about 16%.

Panel B of Table 3.5 shows correlations among the variables we use in our regression analysis. Note that $Hits_t$ and $St. Dev_t$ are significantly positively correlated with a correlation coefficient of 0.06. Consistent with Chan (2003), the relationship between firm size and the number of news hits is positive and highly significant at 0.32.[30] Lagged standard deviation, $St. Dev_{t-1}$, is very highly correlated with the current standard

[29] The precise Compustat variables used are: data 60 for book value, data 6 for total assets, data 9 for long-term debt, and data 172 for net income per share.
[30] Chan (2003) reports a correlation of 0.37.

deviation with a coefficient of 0.65. Lagged size is significantly negatively correlated with St. Dev_t.

Figure 3.3 documents the simple bivariate relationship between news and volatility. We combine IPOs and matching firms into groups based on the average number of days with hits per month. For IPOs, the average number of days with hits per month is 1.4. For matching firms this number drops to 0.84. We see a strong upward trend in monthly standard deviation as the number of days with hits increases.

The correlation matrix and Figure 3.3 provide information on bivariate relations, but in order to control for the effect of all our variables on volatility, we move to a regression framework. We conduct a pooled regression using all months of data and all firms from 1973 to 2003 in the following format:

$$St.\ Dev_t = b_0 + b_1\ Hits_t + b_2\ IPO\ Dum + b_3\ Hits_t * IPO\ Dum + b_4\ Ln\ (Mkt.\ Cap)_{t-1} + b_5\ St.\ Dev_{t-1} + b_6\ Return_t + b_7\ ROE_{t-1} + b_8\ Lev_{t-1} + b_9\ Ln(b/m)_{t-1} + b_{10}\ Tech\ Dum + b_{11}\ 1980s\ Dum + b_{12}\ 1990s\ Dum + e_t \quad (5)$$

We take the natural logarithm of both size and B/M to help reduce the effect of heteroskedasticity. We include both IPO and matching firms in the same regression and use an IPO dummy variable to capture differences between the two samples. We include an interaction term that will help us determine the differential effects of news hits on volatility for IPOs versus matching firms.

Columns two and three of Table 3.6 provide our regression results using all months of data from 1973 to 2003. Note the significantly positive coefficient on the IPO dummy variable of 0.96 (t-statistic of 8.47). This indicates that IPOs have an additional 0.96% contribution to monthly idiosyncratic volatility over matching firms, even after controlling for the other factors in the regression. The $Hits_t$ variable is significant with a coefficient of 0.6 (t-statistic of 13.04). An increase of one news day per month adds 0.6% to monthly idiosyncratic standard deviation for both IPO and matching firms, or approximately 2.1% per year. With the average monthly volatility range between 17% and 19% for matching firms and IPOs, an additional 0.6% contribution to volatility from just one extra news day per month is economically significant as well. The $Hits_t$ * IPO Dum variable is not significantly different from zero. Thus, it appears that news items affect both IPO and non-IPO volatility in a similar manner. The evidence reveals that the increase in idiosyncratic volatility can be partially explained by the fact that there has simply been an increase in news over the last few decades. IPOs are more volatile than matching firms in part because they have experienced greater levels of news in recent years.

The time dummies are significant for both the 1980s and the 1990s, indicating there are unknown factors influencing idiosyncratic volatility over time other than the factors for which we currently control. The other variables in the regression show the signs that we would expect. Larger firms have lower monthly volatility, and lagged volatility has a significantly positive effect on current monthly volatility. Leverage does not significantly impact idiosyncratic volatility. While the impact of ROE_{t-1} is statistically significant (t-statistic of -3.79), it does not appear to be economically significant with a coefficient of -0.00. Our results in this respect are inconsistent with

Wei and Zhang (2003) and Pastor and Veronesi (2003). Firms in the tech industry do have a significantly higher monthly volatility than those in non-tech industries.

As a robustness check, we split the time periods into pre- and post-1990 and run the same regressions (but without time dummies). The results are also reported in Table 3.6. The IPO dummy is again positive and statistically significant, indicating higher average idiosyncratic volatility for IPOs. Note that the hits variable has a positive and significant impact on volatility for both IPOs and matching firms in both regressions. No other qualitative differences emerge from these regressions versus the results from the entire time period.

We also use the natural logarithm of the number of hits [as in Mitchell and Mulherin (1994) and Reese (2003)] and see no difference in results (not tabulated). Finally, we winsorize ROE at the 1^{st} and 99^{th} percentile and also book-to-market at the 99^{th} percentile. This action produces no change in inference (not tabulated).

If we make the assumption that return distributions are independent across days, we can calculate the expected monthly volatility (as measured by variance) as the sum of the daily volatilities within a month. We know that the average number of news days within a month for our sample is one. Thus, taking the variance values for news and non-news days for 1973-1998 from Table 3.4 and the fact that on average we have 20 trading days per month and one news day, we can calculate the monthly expected volatility for the average firm as:

$$\text{Monthly Std} = \sqrt{\sum_{n=1}^{\#\text{ no news}} \text{Std}^2_{\text{no news}} + \sum_{n=1}^{\#\text{ news}} \text{Std}^2_{\text{news}}} \quad (6)$$

The average monthly IPO volatility calculated in this manner from 1973 to 1998 is 22.8%. Note that this value is substantially above the average value of 19.2% given for monthly volatility given in Table 3.1. This is symptomatic of the fact that return distributions are not independent across days. If we wish to determine the effect of increasing the number of hits per month from 1 to 2, we can duplicate the calculations and find that the monthly volatility goes from 22.8% to 23.6%. This increase of 0.8% per month corresponds well to the 0.6% reported in Table 3.6.

3.4.3 Granger Causality

To this point, we have identified a contemporaneous relationship between the number of days with news citations each month and the corresponding idiosyncratic firm volatility. This tells us nothing about causality, however. It may be the case that news publications tend to write more about volatile stocks than less volatile stocks. Similar to CLMX (2001) and Xu and Malkiel (2003), we conduct Granger causality tests to determine the direction of causality between monthly hits and monthly idiosyncratic volatility. First, we form an equally-weighted time series average every month from 1973 to 2003 of IPO idiosyncratic volatility and corresponding monthly news hits.[31] The data are linearly detrended as in CLMX (2001). The average monthly volatilities for each month are regressed on a monthly time trend variable. We calculate the difference between the predicted volatilities from the linear model and the actual monthly volatilities. These differences are then used in the Granger causality tests. A similar detrending method is used for the hits variable.

The regressions for Granger causality are of the form:

$$St.\,Dev_t = a_0 + a_1\,St.\,Dev_{t-1} + \ldots + a_j\,St.\,Dev_{t-j} + b_1\,Hits_{t-1} + \ldots + b_j\,Hits_{t-j} + e_{1t}, \qquad (7)$$

[31] There are 360 total months from January 1973 to December 2003. Due to the fact that some months do not have any hit observations, the total months used in the Granger causality tests is less than 360. We require at least 50 observations in a given month.

$$Hits_t = c_0 + c_1\, St.\, Dev_{t-1} + \ldots + c_k\, St.\, Dev_{t-k} + d_1\, Hits_{t-1} + \ldots + d_k\, Hits_{t-k} + e_{2t}, \qquad (8)$$

The idea of the test in equation seven is to determine if the hits variable provides information about future idiosyncratic volatility above and beyond the information contained in past volatility. The appropriate number of lags *j* or *k* in equations seven and eight are chosen through the Akaike criterion and are reported in parentheses in Table 3.7. We also provide p-values regarding the null hypothesis that monthly hits have no explanatory power for monthly volatility (and vice versa). The number of observations used in each regression will depend on the number of lags chosen by the Akaike criterion. More lags will reduce the number of observations available. The number of observations for each regression is also provided in Table 3.7.

Panel A of Table 3.7 shows that with a p-value of 0.00 we can reject the hypothesis that lagged hits have no explanatory power for idiosyncratic volatility at the 1% level. However, we cannot reject the hypothesis (p-value of 0.20) that monthly volatility has no explanatory power for monthly news hits. The evidence is consistent with our claim that the number of news citations explains at least part of the increase in idiosyncratic volatility over time. As the number of news citations concerning IPOs increases, so does their idiosyncratic volatility.

We repeat the Granger causality tests for the matching firms in Panel B of Table 3.7. The results are similar to those for IPOs. With a p-value of 0.00, we can reject the hypothesis that news hits have no explanatory power for idiosyncratic volatility. We cannot reject the hypothesis (p-value of 0.46) that volatility has no explanatory power for monthly news hits. In sum, for both the IPO and matching firms, it appears the monthly news hit variable has significant explanatory power for monthly idiosyncratic volatility. We find no evidence of the reverse hypothesis that monthly volatility actually drives monthly news.

3.5 Identifying Exogenous Shocks to News

We provide evidence that an increase in news announcements in recent years contributes to the increase in idiosyncratic volatility documented by CLMX (2001). From our Granger causality tests, we learn that the increase in news is driving the increase in volatility, and not vice versa. Ideally, we would like to obtain a measurable exogenous shock to news releases to help reinforce the findings of this paper. The question is whether a shock to news increases the number of news announcements released by firms over our time period as well as the volatility over the same time period. Recall that we document an increase in IPO news items per firm from an average of 72 in the 1980s to 202 in the 1990s (matching firms rise from 57 to 77 over the same time period). Firms themselves could choose to release more news at any time. Our goal in this section is to discuss four entities that may give firms incentives to release more news. Groups that have the power to affect corporate news releases are the stock markets, the Financial Accounting Standards Board (FASB), the Securities and Exchange Commission (SEC), and the court system. Another consideration is actions by our sources themselves, e.g. newspapers and news wire services.

We start by considering the effect of stock market regulations on news. There is the possibility that individual exchanges might alter disclosure rules over our sample period. The exchanges provide disclosure rules to be followed by stocks they list, but the rules are rather vague. For instance, the New York Stock Exchange has an immediate release policy.

> "Any release of information that could reasonably be expected to have an impact on the market for a company's securities should be given to the wire services and the press 'For Immediate Release.'...To insure adequate coverage, releases requiring immediate publicity should be given to Dow Jones & Company, Inc., Reuters Economic Services and Bloomberg Business News"[32]

New York Stock Exchange officials tell us that the language of the disclosure guidelines above has not changed in at least 20 years. The exchange has so broadly defined news as "anything that could reasonably be expected to have an impact on...firm securities," that the news release decision seems to be entirely in the hands of the individual firm. As such, we rule out changes in stock market disclosure regulation as providing possible exogenous shocks to news between the 1970s and 1990s.

It is also possible that FASB may impose new mandatory disclosure rules on firms. If these new rules require firms to provide new information not previously mandated under former guidelines, then firms may feel compelled to release this new information to the press as well. However, our reading of FASB changes over the years shows that these changes tend to be highly industry specific and would apply to very few

[32] NYSE web page: http://lcm.nyse.com

firms in general. We did not uncover any major FASB changes over the last few decades that would cause an increase in news releases for a wide variety of firms.

The SEC creates regulation targeting mandatory firm disclosure in the quarterly and annual reports firms must file with the SEC. Federal securities laws primarily target the remediation of information asymmetries. It has been argued that mandatory disclosure to the SEC should impact the amount of news released in other channels as well. For example, an SEC report issued by the Sommers Committee in the mid-1970s argued that much of the information contained in mandatory disclosure reports was redundant and,

> "...at best confirmed information that earlier had been disseminated by other media. But the report concluded that the mandatory system still played a pivotal role in ensuring the initial corporate disclosure through whatever means and in ensuring the accuracy of the data disclosed." (Seligman 1995)

This report confirms that the media is releasing pertinent and valuable information to investors, often ahead of the official documents firms file with the SEC.

Before 1972, the SEC did not allow any reports to contain predictive data or firm speculation about upcoming financial trends. By the late 1970s, the SEC reversed its position and encouraged this type of "soft" analysis in firms' filed reports. The SEC mandated management projections only in reference to the firm's liquidity, capital resources, and income in 1982. In 1989, however, "...the SEC now regarded disclosure of predictive...information as mandatory in a wide variety of circumstances." (Seligman 1995) This decision in 1989 affected not only firms' filed annual reports, but also the registration statements for initial public offerings. It is possible that this change in SEC regulation in the late 1980s could lead to the increase in firm press releases we see in the 1990s. If firms are mandated to include more management projections in their official SEC filings, it is very possible that these projections find their way into the news media as well.[33]

We also consider court action occurring within our sample period. A 1988 Supreme Court decision in *Basic Inc. v. Levinson* made it easier to engage in large class action suits. People could join in the suits without having specifically relied on misleading statements themselves. The damage assessments from such suits skyrocketed as a result (Seligman 1995). This type of threat might have made firms more likely to disclose more information to the media and also to disclose news earlier. The idea that firms disclose news as soon as possible in order to avoid litigation has also been proposed by Healy and Palepu (2001). We feel it is possible that the large increase in news in the 1990s could be related to a firm's desire to avoid potential lawsuits.

Our final consideration is a broadening of news coverage by our selected newspaper and newswire sources. If a news source broadens its coverage to include more firms, this could translate to the increase in news we document. Additionally, if a news source actually expands the scope or type of firm news covered, this could contribute to the increase in news announcements per firm. For our purposes, it does not

[33] Unfortunately, some major SEC regulation changes that might have an affect on news releases occur outside or right at the very end of our sample. For instance the Securities Exchange Act of 1934 would certainly have an impact on the way that firms release pertinent news. Regulation Fair Disclosure went into effect in 2000 and would also influence press releases. Regulation FD is the source of some controversy though as to whether the regulation results in more information release or less. Bailey, Li, Mao, and Zhong, (2004) state that the amount of news released after Regulation Fair disclosure has increased. On the contrary, Venkatraman, Thompson, and Eleswarapu (2004) state, "...that information flow around mandatory announcements has decreased" since Regulation Fair Disclosure has gone into effect. The Sarbanes-Oxley Act of 2002 could also have an impact on the disclosure of information by firms. However, this act is predominantly related to the auditing and official disclosure statements of a firm as opposed to the release of voluntary news updates.

matter which way coverage is broadened. Mitchell and Mulherin (1994) state that Dow Jones broadened their news coverage in 1989, although they do not state whether this larger coverage derives from more firms or a larger scope of news covered. Dow Jones is our primary news source, accounting for 82% of total news announcements between the Dow Jones newswire and the Wall Street Journal.

It is very possible that more than one of the discussed shocks contributes to the increase in news announcements per firm between the 1970s and 1990s. The three events we feel are most likely to increase news disclosure – court action, SEC mandate for management projections, and increasing coverage from Dow Jones – all occur in the same two-year period from 1988 to 1989. We do not have a way to differentiate among these three competing possibilities, but we do test for significant changes in news and volatility pre- and post this two-year period.

We look at firm news releases before and after 1988 and 1989, the two-year period we wish to examine for shocks to news hits. We calculate the average monthly number of news hits before and after the shock period and find that IPOs from October 1984 to September 1987[34] go from 0.85 hits per month to an average of 1.16 hits per month for January 1990 to December 1992. This difference is statistically significant at the 5% level. We then detrend this data for the IPOs by regressing each month from the sample period onto a time trend and subtracting out the trend for each month. Once the trend has been removed from the data, we see that the IPOs go from 0.85 hits per month before 1988 to 1.11 hits per month after 1989. Once again, this result is statistically significant at the 5% level. We then examine a combination of the matching firms and

[34] We exclude data from October 1987 as we expect the market crash in this month could cause spurious results for both news and volatility.

the IPOs, finding similar results to those seen by the IPOs. These results are contained in Table 3.8.

We have established that the news shocks we are concerned about have caused an increase in news. However, we need to show that they are also responsible for a requisite increase in volatility. To this end, we examine the monthly volatility for the IPOs. We look at volatility from October 1984 through September 1987 finding an average monthly volatility of 15.7%. From January 1990 through December 1992 we find an average monthly volatility of 20.5%. These figures are significantly different at the 5% level. Detrending the data for the volatility in the later period, we find the volatility to be 16.4%. This figure is also significantly different from 15.7% at the 5% level. As seen in Table 3.8, the results for the pooled matching and IPO firms are similar to the IPO results for monthly volatility.

In summary, we see that there are statistically significant changes to news before and after the 1988-1989 time period. We propose that these changes to news are related to at least one of the exogenous events discussed above. We also see that the volatility of firms increases substantially over the same time period, even once the data has been detrended. We conclude that exogenous shocks to news result in increases to both news and volatility.

3.6 Robustness Tests

3.6.1 Sample Evaluation

In order to ensure that a reasonable number of the Factiva dates collected are related to the companies in our search, we evaluate the quality of our data. We select three firms from each decade and read every Factiva article for these companies. The firms are selected based on having a generic name, which might be subject to data collection errors.[35]

The resulting articles are split into three categories: directly related articles, indirectly related articles, and unrelated articles. Directly related articles contain news that is about the firm's profits, sales, management, or any other event that would have a direct impact on the firm. For directly related articles, we do not discriminate on the basis of timeliness. In other words, it is often clear that directly related news is quite stale. Indirectly related articles include news about direct competitors, for instance, but the Factiva search firm is also mentioned in the article. Indirectly related news also includes situations where an article cites an industry expert and the employer of the expert was the Factiva search firm. Unrelated articles have nothing to do with the firm in the Factiva search. Table 3.9 tabulates results for the sample.

The only time there are completely extraneous hits is in the 1990s, making this decade subject to the worst potential data problems (based on our sampling). Therefore, further statistical tests involve only the 1990s decade (it is presumed that earlier decades will be no worse than the 1990s). To make our results even more conservative, we have assumed that neither indirect hits nor unrelated news hits provide poignant news for the firm. This results in 19 fallacious articles out of the 295 articles from the 1990s. Using a binomial distribution for a sample size of 250, we can determine with 95% certainty the limits of the distribution as 3.4% to 9.7% non-direct news. Our conclusion based on this result is that our database is relatively representative of the news being released by the

[35] The companies selected are Superior Services Inc, Community Care Services Inc, International Network Services, Avantek, Bear Creek Corp, Vapor Corp, Laser Photonics, Sigma Research, and Crawford Energy.

firms. Essentially, we can say with 95% certainty that at least 90% of our articles are related to the Factiva search firms.

3.6.2 Restricting Sources to the New York Times and Dow Jones publications

Due to the fact that several of our news sources are not available over the whole sample period, we check to confirm that our results are robust to this data problem. We find that for IPOs 2% of our data points come from the New York Times, which is available over the whole sample period while 80% of our data points come from the Dow Jones Newswire or the Wall Street Journal. The remaining 17% of our data come from other sources listed in Table 3.2.[36] Upon replication of tests using just the New York Times citations, we find results similar to those with the full data set.

3.6 Conclusions

We have shown that idiosyncratic volatility has increased over the last few decades for both IPOs and a size and book-to-market matching sample of firms. The news day return distributions change over time for both samples. The investor reaction to good news is larger for IPO firms in the 1990s than in the 1970s and bad news day returns are becoming more negative across time. The standard deviation of news day returns has increased for both samples, with IPO firms showing a sharper rise in standard deviation across decades. We conclude with cross-sectional and Granger causality regressions that show a statistically significant link between idiosyncratic volatility and

[36] For matching firms, the results are similar with 3% coming from the New York Times, 85% coming from the Wall Street Journal or Dow Jones Newswire, and 12% coming from other sources.

public news. An increase of one news day per month leads to an additional 0.6% in idiosyncratic monthly standard deviation for IPO firms.

While our results are consistent with news driving idiosyncratic firm volatility for IPOs and matching firms, the mechanism of this driving force is not clear. As pointed out by CLMX (2001), an increase in cash flow news should result in decreasing return volatility. There are several potential explanations for why news is driving increased firm volatility. We have controlled for many of the firm effects discussed in the past literature so we consider only additional theories here.

First, it is possible that the type of news is fundamentally changing over time. News from the 1970s might be fundamentally different in nature and scope than news in the 1990s. This view is consistent with the SEC change requiring disclosure of predictive information as well as historical information. However, if this is the case, the predictive information is not providing any benefit for investors, but is negatively impacting value through an increase in idiosyncratic volatility. The increase in news could also be the result of news being broken into smaller pieces and released more consistently across time. As previously stated though, this result would imply a decrease in return kurtosis, not the increase demonstrated in Table 3.1 [see Shiller (1981)]. It is also possible that the news is becoming less informative compared to past years, although it is not clear why this would be the case. In addition, it may be that news is fundamentally the same, but the investor reaction to news is changing. This could manifest itself in over-reaction and under-reaction phenomena, which would tend to increase volatility.

Finally, it is possible that news is driving certain trading behaviors, which are causing the increase in volatility. If the visibility of the firm is increasing due to news flows, the addition of new investors with divergent opinions about the firm could cause an increase in volatility.[37] It is also likely that an increase in the amount of public news about a firm would lower the costs of trading that stock.[38] Such a decrease in trading costs would lead to increased transactions and thus, an increase in the volatility of the stock [Jones, Kaul, and Lipson (1994)]. Thus, increased news flows could lead to changes in trading behavior for investors resulting in higher firm volatility. We certainly do not propose that any one of these effects is exclusive of any other.

Xu and Malkiel (2003) propose that increased volatility is related to increased trading activities by financial institutions. In an interesting bridge between Xu and Malkiel (2003) and our work, Falkenstein (1996) shows that mutual funds avoid stocks with little information, "as measured by the number of major newspaper articles..." written about the firm. In addition, Diamond and Verrecchia (1991) and Kim and Verrechia (1994) argue that voluntary disclosure will lead to increased stock liquidity and higher institutional ownership. If mutual funds are investing in firms with more news releases, then it may be that news releases are the driving force behind increases in idiosyncratic volatility. Thus, it is not clear that our results do not actually explain why institutional ownership appears to be driving volatility as in Xu and Malkiel (2003).

CLMX (2001) were the first to document an increase in idiosyncratic firm volatility over the last few decades. We focus on a subsample -- IPOs and size and book-to-market matched firms -- of the firms originally studied. For these firms, we

[37] Miller (1977) makes the case that increasing the number of investors informed about the firm could raise the price of the stock. However, with more investors trading on beliefs of over or under-pricing, it is also conceivable that such an increase in investor trading would lead to higher firm volatility.
[38] Copeland and Galai (1983) show that increases in public information about a firm should result in a decrease in bid-ask spread. Other decreases in trading costs could come in the form of lower research costs.

provide evidence that the rise in volatility is significantly linked to a rise in public news in recent decades. Given our findings hold for both IPOs and matching firms, we believe more research on the relation between news and volatility across all types of firms would be fruitful.

APPENDIX 3.

TABLES OF ESSAY 3.

Table 3.1

Mean Monthly Standard Deviation in the First Five Trading Years

The sample consists of all IPOs from 1973 to 1998 where the IPO offer price is at least $5. Stock and index return information is collected from the CRSP daily database. Matching the IPOs with firms of similar size and B/M ratio creates the matching firm sample. The matching firms are companies with at least five years on the CRSP database. Monthly volatility is calculated by summing the squared differences in daily returns between the individual stocks and the value-weighted index over the month. For the equal-weighted (EW) calculations, the monthly volatilities are averaged equally across all firms and all months relevant to the given time period. For the value-weighted (VW) calculations, the volatilities are value weighted by market capitalization within each month. The value-weighted volatilities are then averaged equally across all months relevant to the given time period. Kurtosis data is for pooled daily returns for each decade.

	Mean EW Standard Deviation (%)	Mean VW Standard Deviation (%)	Kurtosis
IPOs issued in			
1973-1979	12.4	11.6	44.6
1980-1989	16.7	11.9	125.0
1990-1998	20.9	14.7	359.7
1973-1998	19.2	12.9	
Matching Firms			
1973-1979	14.4	10.5	25.4
1980-1989	15.4	9.8	219.0
1990-1998	17.8	11.6	259.3
1973-1998	16.8	10.7	
Value Weighted Index			
1973-1979	3.7		4.6
1980-1989	3.8		6.4
1990-1998	4.2		7.2
1973-1998	4.0		
Equal Weighted Index			
1973-1979	2.9		8.0
1980-1989	2.5		11.1
1990-1998	3.1		9.9
1973-1998	2.8		

Table 3.2
Factiva News Sources

The Factiva database consists of newspaper, newswire, and periodical publications from Dow Jones & Reuters. Our selection criteria are as follows: the top six U.S. newspapers by circulation with Factiva listings going back to at least 1987, the two newswires with longest data availability, the top two Canadian newspapers by circulation, and the top British business newspaper by circulation.

Source	Publication Type	Coverage Dates
Associated Press	Newswire	12/1/85-present
Chicago Tribune	Newspaper	1/1/85-present
Dow Jones Newswires	Newswire	6/13/79-present
Financial Times	International Newspaper	1/5/80-present
The Globe and Mail	International Newspaper	11/14/77-present
Los Angeles Times	Newspaper	1/1/85-present
New York Times	Abstracts from NYT articles	1/1/69-present
Toronto Star	International Newspaper	1/1/86-present
USA Today	Newspaper	1/4/87-present
The Wall Street Journal	Newspaper	6/13/79-present
The Washington Post	Newspaper	1/1/84-present

Table 3.3
Newspaper and Newswire Citations in the First Five Trading Years

For each IPO or matching firm, the company name as given by the CRSP database is entered into Factiva. The search is done from the IPO date until five years after the IPO date plus the next full calendar month or until the IPO is delisted. For matching firms, the search is performed until another matching firm is chosen, until the IPO firm is delisted, or until five years after the IPO date plus one calendar month. The number of news citations are summed over the first five years of trading, then averaged over the given time period. For News Days per Firm, the days with cites are summed over the first five years of trading and then averaged across all firms in the given time period.

	Number of IPOs in the sample	Mean News Hits per Firm	Mean News Days per Firm
IPOs issued in			
1973-1979	19	23.0	18.8
1980-1989	237	71.5	55.9
1990-1998	353	201.6	105.3
1973-1998	609	145.6	87.3
Matching Firms			
1973-1979		22.9	20.8
1980-1989		57.0	49.2
1990-1998		77.1	52.2
1973-1998		67.6	50.1

Table 3.4
Excess Returns and Standard Deviation of Returns on News and Non-News Days

The sample consists of 10% of IPOs from 1973 to 1998 where the IPO offer price is at least $5. Stock and index return information is collected from the CRSP daily database. Matching the IPOs with firms of similar size and B/M ratio creates the matching firm sample. The matching firms are companies with at least five years on the CRSP database. Daily returns are excess the CRSP value-weighted index. News days are defined as days on which there was a citation in the Factiva database for a firm. IPO first-day initial returns are not included in this data. The sample size for the IPOs is 19 firms for the 1970s, 237 firms for the 1980s, and 353 firms for the 1990s.

Panel A: News Returns

	Mean Excess Daily Returns (%)				Mean Standard Deviation of Returns (%)				Number of Events	
	No News	All News	Good News	Bad News	No News	All News	Good News	Bad News	All News	% Bad news
IPOs issued in										
1973-1979	0.05	0.15	2.66	-2.34	3.05	4.13	3.87	2.60	357	50.1%
1980-1989	0.01	0.29	3.82	-3.26	4.87	6.28	5.62	4.72	13,129	49.8%
1990-1998	0.01	0.39	4.89	-4.23	5.06	8.09	7.43	5.81	37,289	49.3%
1973-1998	0.01	0.36	4.60	-3.96	4.94	7.64	7.01	5.55	50,775	49.5%
Matching Firms										
1973-1979	0.09	0.47	5.15	-3.60	3.57	8.11	9.23	4.09	384	53.5%
1980-1989	0.01	0.34	3.53	-2.84	4.28	5.69	5.31	4.03	11,455	50.1%
1990-1998	0.04	0.56	4.58	-3.62	5.05	7.83	7.58	5.41	18,299	49.0%
1973-1998	0.03	0.47	4.12	-3.30	4.73	7.03	6.83	4.90	30,138	49.5%

Table 3.4 *Continued*

Regressions of Average Excess Returns on News Days

Since means and variances of our variables of interest change over time, we do not utilize a simple t-test to check for differences in returns from Panel A. Instead, the returns are regressed onto dummy variables for decade, whether or not the firm was an IPO, and the appropriate cross-terms.

$$Return_t = b_0 + b_1\,1970s\,Dum + b_2\,1990s\,Dum + b_3\,IPO\,Dum + b_4\,IPO\,Dum * 1970s\,Dum + b_5\,IPO\,Dum * 1990s\,Dum + e_t$$

In the second regression, the residuals from regression (I) are squared and regressed on the same variables. The sample consists of 10% of the IPOs that went public each year from 1973 to 1998 along with firms matched on size and book-to-market ratio. The matching firms are companies with at least five years on the CRSP database. The dependent variable is the news day return for regression (I) and the squared residual from regression (I) for regression (II). A news day is defined as a day on which the Factiva database contains a news report about the firm. The 1970s dummy takes a value of one (zero otherwise) if the IPO occurred during 1973-1979. The 1990s dummy is similarly defined. The IPO dummy variable takes on a value of one (zero otherwise) if the firm is an IPO. The t-statistics given in parentheses are heteroskedasticity-consistent.

Panel B: P-values

	Regression Variable	Intercept	1970s Dum	1990s Dum	IPO Dum	1970s Dum x IPO Dum	1990s Dum x IPO Dum
		b_0	b_1	b_2	b_3	b_4	b_5
(I)	$Return_t$	0.34	0.13	0.22	-0.05	-0.27	-0.12
		(6.45)	(0.33)	(2.81)	(-0.59)	(-0.59)	(-1.17)
(II)	$Residuals_t^2$	0.003	0.004	0.003	0.001	-0.006	-0.000
		(19.37)	(1.42)	(7.49)	(2.74)	(-2.30)	(-0.40)

Table 3.5
Summary Statistics for IPOs and Matching Firms

The sample consists of all IPOs and matching firms from 1973 to 1998 where the IPO offer price is at least \$5 and complete data on all of the variables is available. Stock return information is collected from the CRSP daily database. Accounting variables come from Compustat. Matching the IPOs with firms of similar size and B/M ratio creates the matching firm sample. The matching firms are companies with at least five years on the CRSP database. All variables are calculated on a firm-level basis. St. Dev $_t$ is the monthly standard deviation of daily returns. $Hits_t$ is the monthly number of days the firm is cited in our Factiva database. The IPO dummy takes a value of one (zero otherwise) if the firm conducted an IPO within the last five years. Mkt. Cap $_{t-1}$ is last month's market value, and $Return_t$ is the monthly excess return. ROE_{t-1} is the trailing year's earnings divided by trailing year book value. Lev_{t-1} is the trailing year's long-term debt divided by trailing year total assets. The Tech dummy takes on a value of one (zero otherwise) if the firm belonged to the technology or Internet industry. Ln(b/m) $_{t-1}$ is calculated as the natural logarithm of last year's book value divided by the previous month's market capitalization. P-values are given in brackets.

Panel A: Means Across First Five Trading Years

Item	IPOs	Matching
Market Cap.	\$307 million	\$291 million
% Tech	13.9%	7.5%
B/M	0.67	1.18
Leverage	15.5%	16.6%

Table 3.5 (cont)

Panel B: Monthly Correlations

	IPO Dum	Hits t	St. Dev t	St. Dev t-1	Return$_t$	Tech Dum	Ln (MkCap) t-1	Lever-age t-1	Ln (b/m) t-1
IPO Dum									
Hits t	0.14 [0.00]								
St. Dev t	0.07 [0.00]	0.06 [0.00]							
St. Dev t-1	0.07 [0.00]	0.01 [0.00]	0.65 [0.00]						
Return$_t$	-0.00 [0.04]	0.03 [0.00]	0.34 [0.00]	0.16 [0.00]					
Tech Dum	0.10 [0.00]	0.03 [0.00]	0.06 [0.00]	0.06 [0.00]	0.01 [0.00]				
Ln(MkCap) t-1	0.02 [0.00]	0.32 [0.00]	-0.34 [0.00]	-0.34 [0.00]	-0.07 [0.00]	0.01 [0.00]			
Lever-age t-1	-0.03 [0.00]	0.02 [0.00]	-0.05 [0.00]	-0.06 [0.00]	-0.02 [0.00]	-0.09 [0.00]	0.01 [0.00]		
Ln (b/m) t-1	-0.13 [0.00]	-0.14 [0.00]	0.11 [0.00]	0.13 [0.00]	0.05 [0.00]	-0.08 [0.00]	-0.39 [0.00]	0.00 [0.62]	
ROE t-1	0.00 [0.08]	-0.00 [0.46]	-0.01 [0.00]	-0.01 [0.00]	-0.00 [0.14]	0.01 [0.00]	0.01 [0.00]	0.02 [0.00]	-0.03 [0.00]

Table 3.6

Regressions of Monthly Standard Deviation on the Monthly Number of News Hits and Control Variables

The sample consists of all IPOs and matching firms from 1973 to 1998 where the IPO offer price is at least $5 and complete data on all of the variables is available. Matching the IPOs with firms of similar size and B/M ratio creates the matching firm sample. The matching firms are companies with at least five years on the CRSP database. All variables are calculated on a firm-level basis. The dependent variable is the monthly standard deviation of daily returns. $Hits_t$ is the monthly number of days the firm is cited in our Factiva database.

The IPO dummy takes a value of one (zero otherwise) if the firm conducted an IPO within the last five years. Ln(Mkt. Cap) $_{t-1}$ is natural logarithm of last month's market value, and Return $_{t-1}$ is the monthly return. ROE_{t-1} is the trailing year's earnings divided by trailing year book value. Lev_{t-1} is the trailing year's long-term debt divided by trailing year total assets. The 1980s dummy takes a value of one (zero otherwise) if the IPO occurred during 1980-1989. The 1990s dummy is similarly defined. The interaction term multiplies the monthly hits total by the the IPO dummy. The Tech dummy takes on a value of one (zero otherwise) if the firm belonged to the technology or Internet industry. $Ln(b/m)_{t-1}$ is calculated as the natural logarithm of last year's book value divided by the previous month's market capitalization. All regressions are heteroskedasticity consistent.

$$St.\ Dev_t = b_0 + b_1\,Hits_t + b_2\,IPO\,Dum + b_3\,Hits_t * IPO\,Dum + b_4\,Ln\,(Mkt.\ Cap)_{t-1} + b_5\,St.\ Dev_{t-1} + b_6\,Return_t + b_7\,ROE_{t-1} + b_8\,Lev_{t-1} + b_9\,Ln(b/m)_{t-1} + b_{10}\,Tech\,Dum + b_{11}\,1980s\,Dum + b_{12}\,1990s\,Dum + e_t$$

Table 3.6

	1973-1998		1973-1989		1990-2003	
	Coefficient (%)	t-statistic	Coefficient (%)	t-statistic	Coefficient (%)	t-statistic
$Hits_t$	0.60	13.04	0.58	7.87	0.56	9.69
IPO Dum	0.96	8.47	1.25	7.95	0.73	4.70
$Hits_t$* IPO Dum	0.04	0.69	-0.08	-0.96	0.15	1.88
Ln (Mkt. Cap) $_{t-1}$	-1.97	-34.71	-1.52	-20.05	-2.26	-28.18
St. Dev_{t-1}	54.76	41.82	55.02	28.39	54.22	31.62
$Return_{t-1}$	14.48	15.07	14.81	10.08	14.25	11.66
ROE $_{t-1}$	-0.00	-3.79	-0.00	-1.65	-0.02	-10.29
Lev $_{t-1}$	-0.05	-0.21	0.57	1.83	-0.57	-1.86
Ln(b/m) $_{t-1}$	-0.35	-8.93	-0.13	-1.81	-0.51	-9.85
Tech Dum	0.53	4.06	0.17	0.77	0.61	3.73
1980s Dum	2.04	10.78	--	--	--	--
1990s Dum	5.00	22.61	--	--	--	--
Intercept	11.09	30.76	11.40	22.87	17.58	28.35
Observations	51,919		21,019		30,900	
R-squared	51.1%		47.3%		52.2%	

Table 3.7
Granger Causality

A minimum of 50 hits observations is required for each monthly observation. This requirement corresponds to months from June 1983 to February 2002. Stock return information is collected from the CRSP daily database. Matching the IPOs with firms of similar size and B/M ratio creates the matching firm sample. The matching firms are companies with at least five years on the CRSP database. St. Dev_t is the monthly standard deviation of daily returns. $Hits_t$ is the monthly number of days the firm is cited in our Factiva database. The table reports the p-values of Granger-causality VAR tests. The null hypothesis is that lags 1 through *k* of the variable in column 1 do not help predict the values of the variables in columns 2 and 3, after controlling for other variables in the VAR. The number of lags *k* appropriate for each VAR is chosen through the Akaike criterion and is given in parentheses below the p-value. Both St. Dev_t and $Hits_t$ are linearly detrended before conducting the VARs. The number of observations N used in each regression is also reported.

Panel A: IPOs

	Std. Dev_t	$Hits_t$
Std. Dev_{t-1}	--	0.20 (9) N = 216
$Hits_{t-1}$	0.00 (2) N = 223	--

Panel B: Matching Firms

	Std. Dev_t	$Hits_t$
Std. Dev_{t-1}	--	0.46 (6) N = 219
$Hits_{t-1}$	0.00 (2) N = 223	--

Table 3.8
Changes in Monthly News Hits and Volatility,
Pre- and Post-Exogenous News Shocks

The sample consists of 10% of the IPOs that went public each year from 1973 to 1998 along with firms matched on size and book-to-market ratio. The matching firms are companies with at least five years on the CRSP database. Factiva was utilized to find every news report for the first five years a stock was publicly traded. The mean monthly news days per firm is the average number of hits pooled across firms and time. Volatilities are pooled across firms and over time as well. The third column gives the number of firms that are within five years of going public in the sample period. T-stats for differences between the two time periods (pre-1988/89 and post 1988/89) are contained in parentheses. Detrended data uses the monthly values from hits per firm or monthly volatilities from January 1980-December 1990 and regresses them on a time trend. The coefficient for the time trend provides the increase in hits (or volatility) per month. This coefficient is then multiplied by the number of months separating the two time periods and subtracted from the second data point. There are three exogenous events that occur in 1988 and 1989 that could affect firm release of information. First, in 1989 the Securities and Exchange Commission mandated managerial release of predictive content in firm statements. Second, the Supreme Court Decision in *Basic Inc vs. Levinson* occurred in 1988. This court decision made it more likely that firms would release timely information to decrease their lawsuit risks. Lastly, the Dow Jones newswire service broadened its coverage in 1989. This increase in coverage would inevitably result in an increase in news about firms.

	News Years	Number of Firms	Mean Monthly News Days/Firm	Detrended Monthly News Days/Firm	Mean Monthly Standard Dev. (%)	Detrended Monthly Standard Dev. (%)
IPOs	Oct. 1984 to Sep. 1987	114	0.85	0.85	15.70	15.70
	Jan. 1990 to Dec. 1992	88	1.16 (8.58)	1.11 (7.26)	20.50 (14.41)	16.42 (2.15)
IPOs and Matching	Oct. 1984 to Sep. 1987	209	0.86	0.86	13.39	13.39
	Jan. 1990 to Dec. 1992	159	1.06 (8.61)	1.02 (6.63)	18.12 (17.98)	14.28 (3.37)

Table 3.9
Articles Related to the Factiva Search Firms

A sample of three firms is taken from each decade and all the news articles found in Factiva for these firms are read. Articles are categorized into direct news, indirect news, and unrelated news. Based on a binomial distribution with sample size of 250, the range of non-related news is conservatively estimated at 3.4% - 9.7% with 95% certainty.

Panel A: News Content

	Direct News	Indirect News	Unrelated News	Total
All Firms	484	24	3	511
	94.7%	4.7%	0.6%	100%
1990s Firms	276	16	3	295
	93.6%	5.4%	1.0%	100%

Panel B: Estimation of Unrelated News

		Max Unrelated News		Min Unrelated News
N=250	Upper limit =	9.7%	Lower Limit =	3.4%

APPENDIX A.

DATA CONSTRUCTION

Data Construction for Essay 3

There are two possible data errors to consider in our Factiva collection process. First, we may omit dates where news is actually released, and second, non-news dates may erroneously be recorded as news dates. These errors may cause two potential biases in our procedure.

If news days have the same return distribution as non-news days, then any data collection error will not have an effect on the results. If the distributions are the same, then the sorting of news days and non-news days can be at random and will still show no difference between the distributions. Of course, this is the trivial case.

If news days have more volatile returns than non-news days, this actually biases against our finding a difference. For instance, if news days are omitted (potential error one), they will cause an increase in the non-news day volatility decreasing the difference between the two groups. If non-news days are included in the news day returns (potential error two), they will have the propensity to lower news day return volatility. Thus, it can be seen that any errors in the database will be biased against the hypothesis that news days have higher volatilities than non-news days.

APPENDIX B

FIGURES

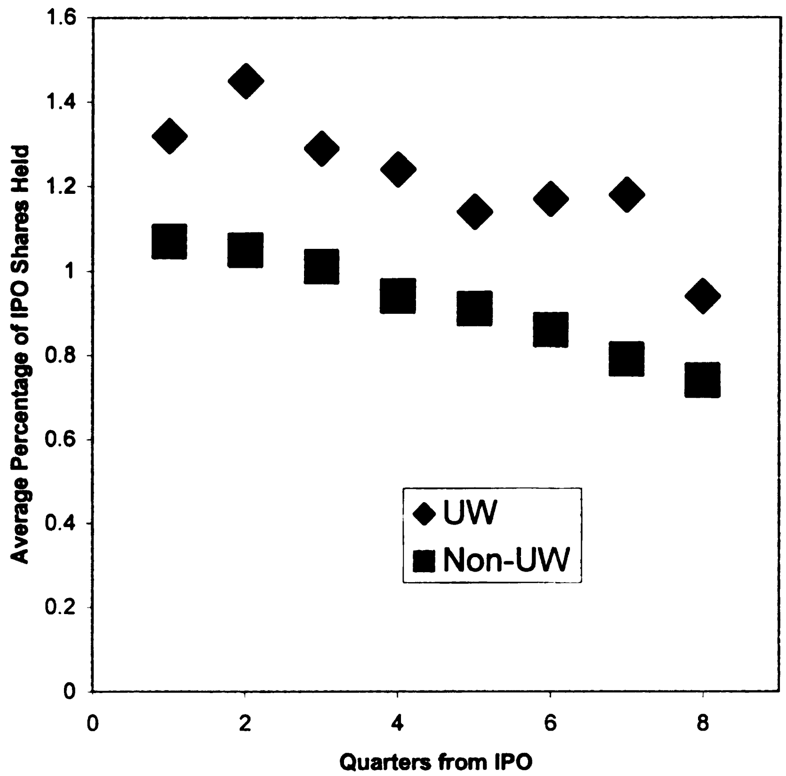

Figure 1.1 Underwriter and Non-Underwriter IPO Holdings. We examine underwriters that are classified in the SDC IPO database as lead underwriters between 1993 and 1998. These underwriters must also have an asset management division that files quarterly 13f statements with the SEC. For each IPO, we refer to "underwriters" as those investment bank/asset managers that underwrite the IPO and hold shares in a given quarter. We refer to "non-underwriters" as those investment bank/asset managers that do not underwrite the given IPO, but do hold shares in the given quarter. Measurement of the first eight quarters of trading begins at the first calendar quarter after the IPO date. The percentage of shares held is defined as the number of shares stated in the quarterly 13f filings (obtained from Thomson Financial) divided by the number of shares outstanding (obtained from CRSP).

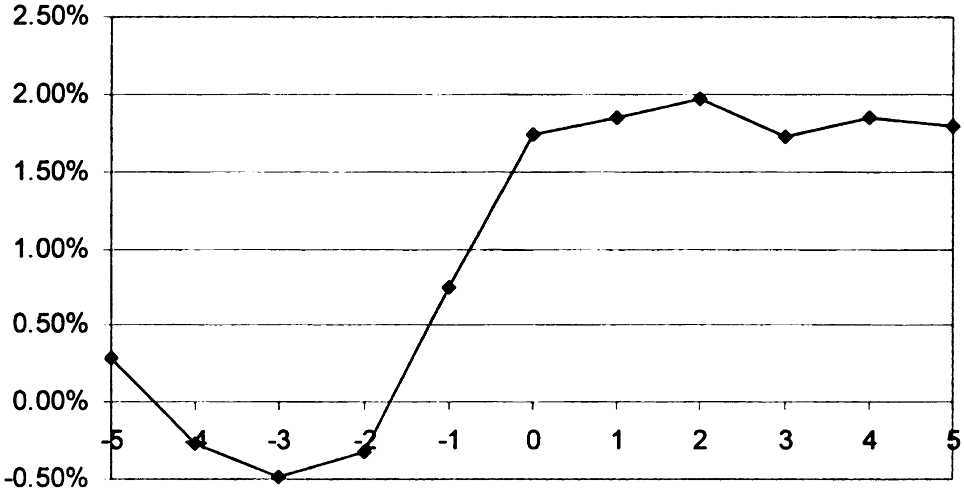

Figure 2.1 Cumulative market-adjusted returns: Returns around the Earnings Announcement made during the quiet period. This figure plots cumulative market-adjusted returns for the period prior to and after the release of earnings news during the quiet period. The average abnormal return for the 132 firms that release earnings information during the quiet period from the day before to the day of the announcement is 2.04%.

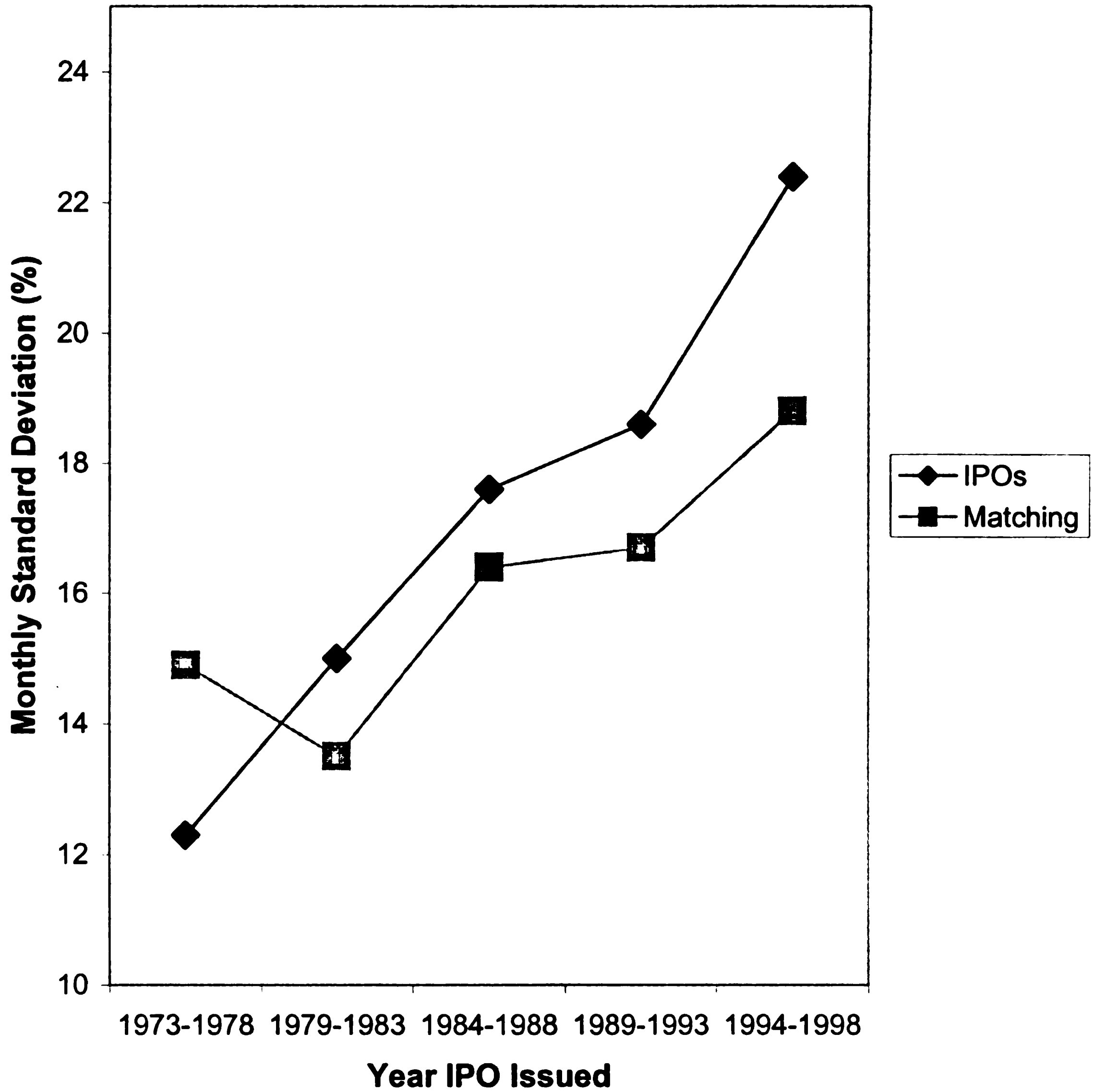

Figure 3.1. Monthly volatility over time for IPOs issued from 1973-1998. This figure shows the average monthly volatility for the IPOs in our sample averaged over five year increments. The graph also shows the average monthly volatility for firms matched to the IPOs based on size and book-to-market. Volatility is calculated using the CLMX (2001) method. Volatility over each five-year block is the equally weighted average monthly volatility for each firm.

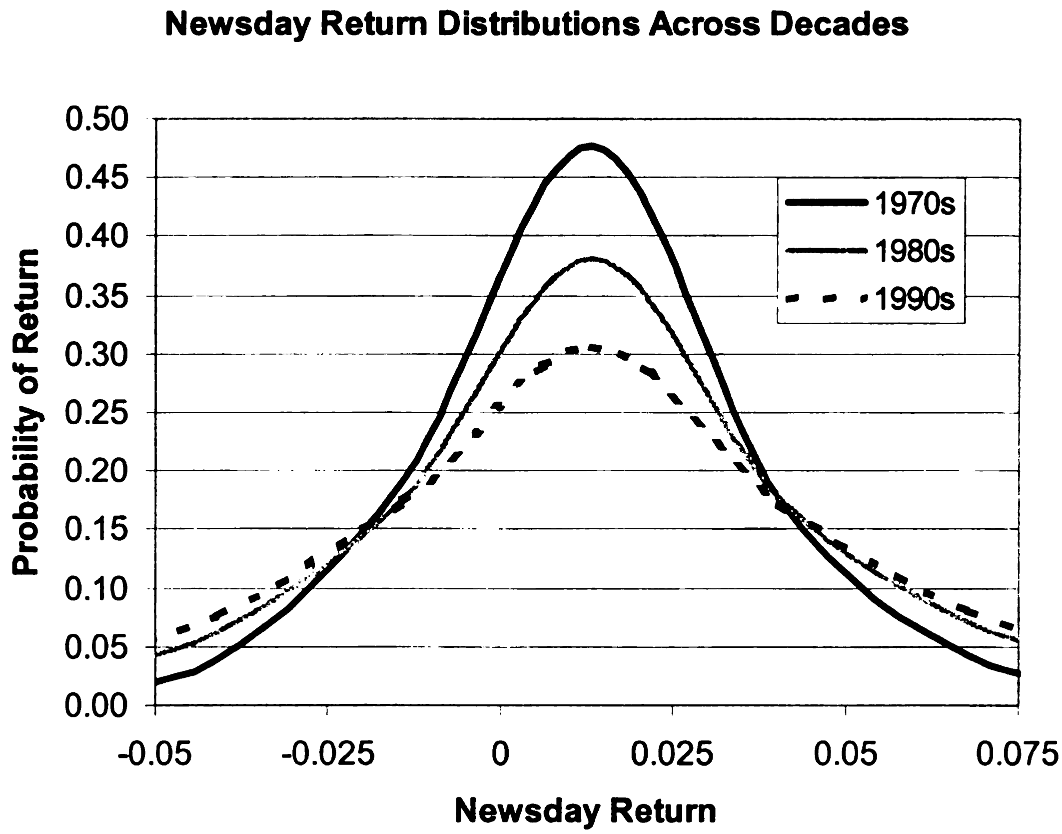

Figure 3.2. News Day return probability distribution across decades for sampled IPO firms. The sample consists of 10% of the IPOs that go public each year. The firm sample size is 19, 237, and 353 across the decades of the 1970s, 1980s, and 1990s, respectively. Factiva is utilized to search for every day on which news is released for each firm in our sample. The CRSP database is then used to obtain the news day returns for each time news is released about the firm. The total number of news day returns for each decade is 357, 13,129, and 37,289.

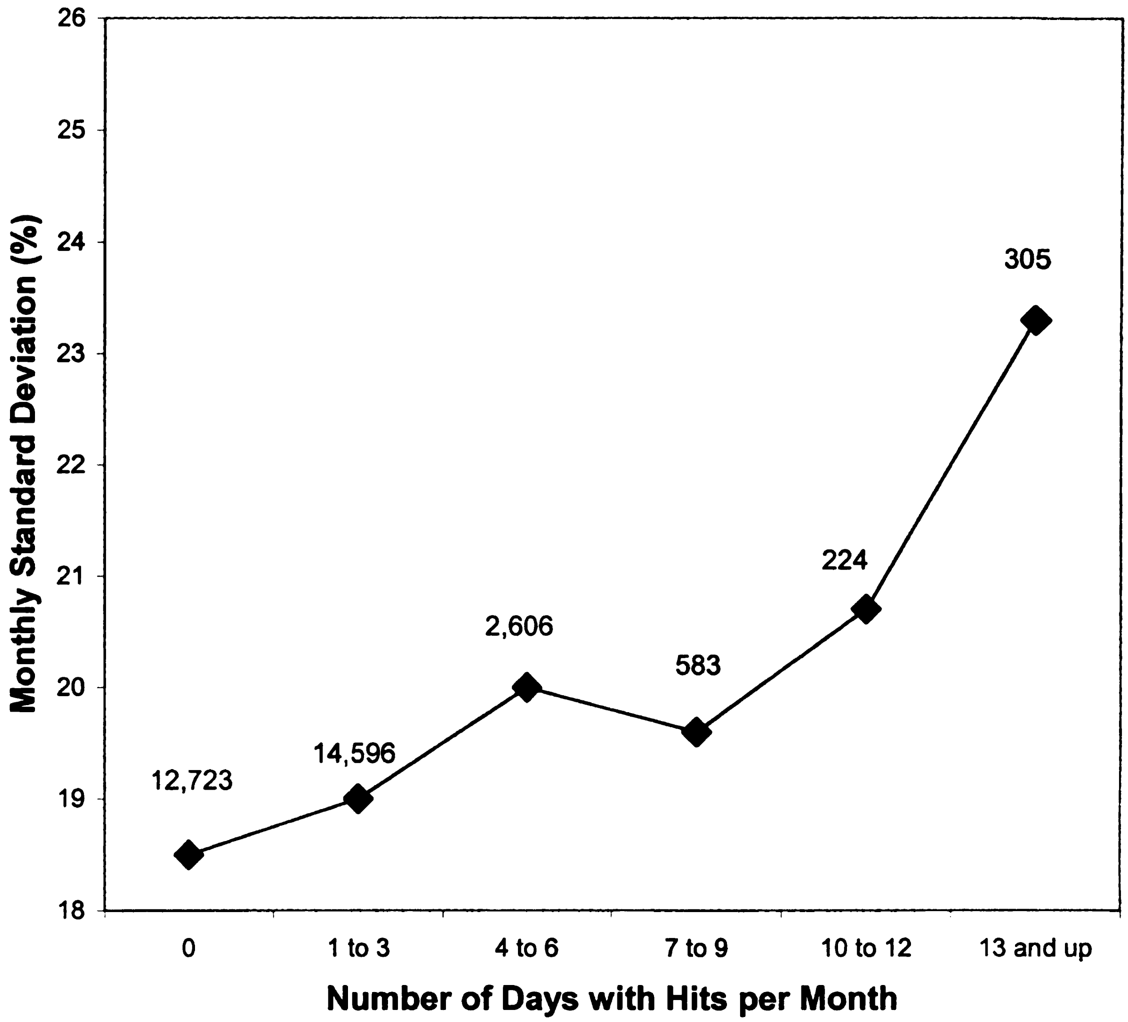

Figure 3.3. Relation Between Number of News Days per Month and Monthly Volatility. The sample consists of 10% of the IPOs that go public each year from 1973 to 1998 as well as firms matched to the IPOs based on size and book-to-market. The number of days with news (obtained from Factiva) is summed over each month for both IPOs and matching firms. Volatility is calculated using the CLMX (2001) method. The number of observations for each grouping is listed above the corresponding data node.

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