Does Managerial Optimism Lead to Long-Run Underperformance?

Evidence from Venture Capital-Backed IPOs

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Abstract

In a sample of 340 venture capital-backed IPOs, I find that IPOs with more optimistic managers underperform IPOs with less optimistic managers in the long-run. Moreover, the IPOs of the most optimistic managers underperform in the long-run when compared to a benchmark portfolio or even on a factor-adjusted basis, while the IPOs of the least optimistic manager do not. In terms of operating performance, firms with the most optimistic managers perform well at the time of the offer, thus justifying their high valuation relative to firms with the least optimistic managers. This operating performance advantage disappears over time however because optimistic managers invest too little in the years after the offer. Instead, optimistic managers choose to pay off their short and long-term debt, suggesting that their underperformance is driven by underinvestment.

JEL classification: G12; G14; G24

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1. Introduction

In this paper, I find that IPOs with more optimistic managers underperform IPOs with less optimistic managers in the long-run. Moreover, the IPOs of the most optimistic managers underperform in the long-run when compared to a benchmark portfolio or even on a factor-adjusted basis, while the IPOs of the least optimistic manager do not. This underperformance is driven by the underinvestment of the most optimistic managers: they invest less in the years after the IPO, choosing instead to pay off their short and long-term debt.

The long-run underperformance of initial public offerings (IPOs) is a well-documented phenomenon. Ritter (1991) and Loughran and Ritter (1995) are among the first to document the long-run underperformance of IPOs. Ritter (1991) attributes the underperformance to an IPO market in which investors tend to be overoptimistic about the earnings potential of young growth firms. Other studies document additional patterns in long-run performance. For example, Brav and Gompers (1997) and Brav, Geczy, and Gompers (2000) find that underperformance is concentrated among nonventure capital-backed firms and small firms with low book-to-market ratios. Purnanandam and Swaminathan (2004) suggest that IPO investors pay too much attention to optimistic growth forecasts and too little attention to profitability in valuing IPOs, giving rise to overvaluation at the offer price and a long-run decline to fair value. Despite these and other studies on IPOs, the sources of the long-run underperformance remain unresolved. Ritter and Welch (2002) suggest that overinvestment by optimistic managers may help explain some of the long-run underperformance. However, both overinvestment and underinvestment can lead to long-run underperformance. According to Heaton (2002) optimistic managers overinvest when they take on negative net present value (NPV) projects that they perceive to be positive NPV projects, and they underinvest when they decline positive NPV projects which require external

financing because they believe the market undervalues their company's stock. Both of these decisions would lead to long-run underperformance.

This study finds that IPOs with more optimistic managers underperform IPOs with less optimistic managers by about 61% on average in the 3 year period following the offer. Furthermore, the median firm underperforms by about 46% over the same period. These results are robust to both style-adjusting the returns using a size and book-to-market reference portfolio and risk-adjusting the returns using the Fama-French 3 factors. Is the long-run underperformance a result of overinvestment or underinvestment? The evidence suggests that they are driven by underinvestment. While the IPOs of more optimistic managers tend to outperform the IPOs of less optimistic managers in the year of the offer, in terms of operating performance, this advantage disappears by year 3. In particular, the median earnings per share for more optimistic managers is significantly higher by $0.69 than for less optimistic managers in the year of the offer. By the third year after the offer, this number is an insignificant $0.21. Similarly, the median return on assets of more optimistic managers is significantly higher by 47% in the year of the offer. By the third year after the offer, this number is an insignificant 10%. These results are robust to industry-adjusting. The reason for the poor relative performance of more optimistic managers is that they invest significantly less in the years after the offer, choosing instead to pay off short and long-term debt. In the three years after the offer, more optimistic managers invest 11%, 8% and 7% less (investment as a percentage of assets), respectively. Around the same time, these highly optimistic managers reduce their debt to assets by 5% and 7% more than less optimistic managers in the second and third year after the offer.

The main challenge in assessing the impact of managerial optimism on long-run performance is finding a reasonable measure of managerial optimism. I use the file-to-value ratio

as such a measure. The numerator is the value of the firm at the filing date, and represents the manager's appraisal of the firm's value. The denominator is the most recent valuation, given after a round of funding in the two years prior to the filing date by one of the venture capitalists backing the IPO, and it represents the firm's intrinsic value. Therefore, the file-to-value ratio represents how optimistic the manager's valuation is relative to the venture capitalist's valuation.

I find that overall, IPO firm managers tend to be very optimistic, in that they value the firm at about 3 to 4 times the venture capitalist valuation. Also, IPOs with high file-to-value ratios adjust their share price less between the file date and the offer date, and are "underpriced" by almost 5% less than IPOs with low file-to-value ratios.[1] This suggests that managers with high file-to-value ratios are indeed more optimistic about their future cash flows since the share price they set at the file date is closer to the market price as compared to managers with low file-to-value ratios.

Using the file-to-value ratio as a measure of managerial optimism can lead to a classic errors-in-variables problem. Because the file-to-value ratio, which is constructed with firm and offer characteristics, is an imperfect measure of managerial optimism, it is likely that the measurement error will cause the regression coefficient to be biased toward zero and inconsistent.[2] To address this measurement error problem, I use the chief executive officer's age and education as instrumental variables. Results remain qualitatively similar when using the instrumental variables approach.

There are three other potential explanations for the results found in this paper. The first is that managers are timing the market. Optimistic managers unwittingly price their issue high

[1] The file date is the first date on which a company files a registration statement with the Securities and Exchange Commission, while the offer date is the date when shares are allocated to investors. In the sample in this paper, the average time between the file date and offer date is 88 days (the median is 66 days).
[2] See Wooldridge (2003) for a more detailed explanation of errors-in-variables.

because they overestimate their future cash flows or underestimate the discount rate, whereas market timing managers realize that their assets are overvalued in the market, and price their offer high to take advantage of this misvaluation.[3] I control for this alternate explanation by including firm, industry and market-level variables of investor optimism and uncertainty that may be at the root of the misvaluation which managers would potentially take advantage of. Additionally, I limit the sample to IPOs issued during low investor sentiment[4] periods (below median) in unreported tests, and find that results are actually slightly stronger on this subsample.

Second, Teoh, Welch and Wong (1998a) show that long-run market performance can be driven by discretionary current accruals. Managers can increase current accruals by, for example, advancing recognition of revenues with credit sales before cash is received or by delaying the recognition of expenses when cash is advanced to suppliers. Discretionary current accruals are not independent of managerial optimism however. Teoh et al. (1998a) note that high discretionary current accruals may result from unintentional overoptimism by the managers about future cash flows. I nevertheless include their measure of discretionary current accruals and find that the results are not being driven by earnings management.

Last, a recent paper by Ivanov, Krishnan, Masulis and Singh (2008) finds that IPOs with higher venture capitalist reputation tend to have better long-run performance than IPOs with lower venture capitalist reputation. I control for this effect by including their measure of venture capital reputation in all of the regressions to ensure that the file-to-value ratio is not another proxy for venture capital reputation.

[3] See Baker, Ruback and Wurgler (2007) for more detail about irrational managers.
[4] Baker and Wurgler (2006) construct their investor sentiment measure using six proxies: the closed-end fund discount, the NYSE share turnover, the number of IPOs and the average first-day returns of IPOs, the share of equity issues in total equity and debt issues, and the dividend premium.

This paper contributes to the IPO literature by documenting empirically for the first time a role for managerial optimism in explaining the long-run performance of IPOs. This relationship is driven by optimistic managers who underinvest in their firm in the years after the offer, instead choosing to pay down their company's short and long-term debt. This is also the first time that underinvestment has been found in a sample of IPOs: this may not be surprising given these firms are precisely the types of firms which are not likely to have sufficient internal funds to subsidize all of their prospective projects.

The remainder of the paper is structured as follows. Section 2 reviews the literature and develops the hypothesis. Section 3 describes the data and summary statistics of the IPO sample. Section 4 examines the link between the file-to-value ratio and managerial optimism. Section 5 presents long-run buy-and-hold portfolio returns as well as cross-sectional long-run risk-adjusted return regressions. Section 6 examines whether overinvestment or underinvestment may explain the long-run underperformance of optimistic managers by examining long-run operating performance, investment intensity and leverage. Section 7 reports the instrumental variables regressions as well as other robustness tests, and Section 8 concludes.

2. Literature Review and Hypothesis Development

Ritter (1991) and Loughran and Ritter (1995) are among the first to document the long-run underperformance of IPOs. Ritter (1991) attributes the underperformance to an IPO market in which investors are periodically overoptimistic about the earnings potential of young growth firms. Brav and Gompers (1997) and Brav et al. (2000) find that the underperformance described in Loughran and Ritter (1995) is concentrated among nonventure capital-backed firms and small firms with low book-to-market. Purnanandam and Swaminathan (2004) suggest that IPO

investors pay too much attention to optimistic growth forecasts and too little attention to profitability in valuing IPOs, giving rise to a long-run decline to fair value.

One explanation for these empirical findings is that investors are irrational, in that they are too optimistic or overconfident. These behavioral traits lead to overvaluation followed by long-run underperformance. The overvaluation is cause by optimistic investors who pay too much for shares in a firm. Alternatively, having overconfident investors (some of who err on the optimistic side while others err on the pessimistic side) would lead to the same conclusion if the pessimistic investors are kept on the sidelines due to short sales constraints or even limits to arbitrage. The subsequent long-run underperformance is the result of investors discovering the true firm value over time. Miller (1977) predicts that in the presence of short-sales constraints, the price of a firm tends to reflect the valuations of the most optimistic investors, and thus tend to be upward biased.[5] This is the case because pessimistic investors are forced out of the market when short-sales are not available. Therefore, greater divergence in investor beliefs about the firm's true value will lead to short-run overvaluation and long-run underperformance. Even when short-sales are allowed after the offer, the view of pessimistic investors may not be reflected in the prices in the short-run because there are limits to arbitrage in practice (see Shleifer and Vishny (1997)). Daniel, Hirshleifer and Subrahmanyam (1998) propose that overvaluation is due to investor overconfidence about the precision of their private information. Ljungqvist, Nanda and Singh (2006) model IPO pricing assuming the existence of a fraction of sentiment-driven investors who are overoptimistic about the prospects of the IPO firms. With regards to IPOs, both of these theories imply overvaluation, which when subsequently corrected,

[5] Miller (1977) could be considered "semi-rational" in the sense that the source of the investor heterogeneity is not specified.

leads to poor long-run performance. A number of recent empirical papers lend support to the existence of irrational investors in IPO markets.[6]

Another potential explanation for the long-run underperformance of IPOs is that managers are irrational, in that they overestimate their future cash flows or underestimate the discount rate. Heaton (2002) finds in his theoretical paper that optimistic managers overvalue their own corporate projects and may wish to invest in negative net present value (NPV) projects even when they are loyal to shareholders because they believe the project to have a positive NPV (overinvestment). However, if managers are dependent on external sources of financing, they may pass up positive NPV projects because they believe that investors undervalue their company's stock (underinvestment). Malmendier and Tate (2005) find, both theoretically and empirically, that overconfident CEOs invest more when they have more cash at hand, but curtail investment when they require external financing.[7] Further, the sensitivity of investment to cash flow is strongest for CEOs of equity-dependent firms. Ritter and Welch (2002) suggest that the overinvestment caused by managerial optimism may be a source of long-run underperformance in IPOs. Loughran and Ritter (1997) find evidence of this by examining the operating performance of a sample of SEOs. They report that firms are investing in what the market views as positive NPV projects, but are in fact often negative NPV projects, suggesting that managers are just as overoptimistic about the future firms' profitability as are investors. In a recent survey of chief financial officers, Brau, Ryan and DeGraw (2006) find that companies that focus on

[6] Derrien (2005), Cornelli, Goldreich and Ljungqvist (2006), Houge, Loughran, Suchanek, and Yan (2001), and Dong and Michel (2008) are some examples.

[7] Overconfidence in Malmendier and Tate (2005) is equivalent to overoptimism in Heaton (2002), in that overconfident managers overestimate the returns to their investment projects and view external funds as unduly costly.

immediate growth opportunities (i.e. firms that are likely to overinvest) experience long-run underperformance, while those that focus on long-term growth do not.

The goal of this paper is to examine whether managerial optimism can help to explain the long-run underperformance in IPOs. The main challenge is determining a measure of managerial optimism. I use the file-to-value ratio as such a measure. The numerator is the value of the firm at the filing date, and represents the manager's appraisal of the firm's value. The denominator is the most recent valuation, given after a round of funding in the two years prior to the filing date by one of the venture capitalists backing the IPO, representing the firm's intrinsic value. Therefore, the file-to-value ratio represents how optimistic the manager's valuation is relative to the venture capitalist's valuation. Specifically, the file-to-value ratio (FTV) is given by:

$$FTV \equiv V_{mgr} / V_{vc} = P_{file} \times N_{file} / V_{vc}$$

where P_{file} is the middle point of the file range, N_{file} is the shares outstanding prior to the offer plus shares filed and V_{vc} is the venture capitalist valuation. The use of a recent valuation as an estimate of the current valuation is not new. The International Private Equity and Venture Capital Valuation Guidelines (2006)[8] list the "Price of Recent Investment" as one of the most widely used valuation methodologies. In particular, the Guidelines note:

> *"Where there has been any recent Investment in the Investee Company, the price of that Investment will provide a basis of the valuation."* [9]

[8] These guidelines were developed by the Association Française des Investisseurs en Capital (AFIC), the British Venture Capital Association (BVCA), and the European Private Equity and Venture Capital Association (EVCA), and are available at www.privateequityvaluation.com.

[9] A Fund's Investment refers to all the financial instruments in an Investee Company held by the Fund. The term Investee Company refers to a single business or group of businesses in which a Fund is directly invested. The Fund is a generic term used to refer to any designated pool of investment capital targeted at private equity Investment, including those held by corporate entities, limited partnerships and other investment vehicles.

More recently, in the mergers and acquisitions literature, Cooney, Moeller and Stegemoller (2008) have used this valuation methodology to examine the effect of the revision in the valuation of a private target firm on the announcement effect of the acquiring firm.

Using file-to-value as a measure of managerial optimism, I test the hypothesis that IPO firms with more optimistic managers underperform IPO firms with less optimistic managers. This paper contributes to the IPO literature by documenting empirically for the first time the role of managerial optimism in explaining the long-run performance of IPOs. Also, this paper shows that the relationship between managerial optimism and long-run underperformance is driven by optimistic managers who underinvest in their company in the years after the offer.

There are three other potential explanations for the results found in this paper. The first is that managers are timing the market. Optimistic managers price their issue at a high value because they overestimate their future cash flows or underestimate the discount rate. Market timing managers, on the other hand, realize that their assets are overvalued in the market, and price their offer high to take advantage of this misvaluation. The misvaluation in the market may be due to asymmetric information between managers and investors, as in Bayless and Chaplinsky (1996), overly optimistic investors, as in Teoh, Welch and Wong (1998a, 1998b), or waves of investor sentiment, as in Baker and Wurgler (2007)[10]. I control for this alternate explanation by including firm, industry and market-level variables of investor optimism and uncertainty that may be at the root of the misvaluation which managers would potentially take advantage of. Additionally, I use a subsample of IPOs with low investor sentiment at the time of the offer to make sure that results are not driven by market timing manager in high investor sentiment periods.

[10] See Eckbo, Masulis and Norli (2007) for a review of security offerings and market timing.

Second, Teoh et al. (1998a) show that long-run market performance can be driven by discretionary current accruals. Managers can increase current accruals by, for example, advancing recognition of revenues with credit sales before cash is received or by delaying the recognition of expenses when cash is advanced to suppliers. The business conditions usually faced by a firm in its industry may justify some accrual adjustments. Given that these business conditions can be expected by investors, current accruals must therefore be decomposed into nondiscetionary current accruals (current accruals predicted by industry conditions) and discretionary current accruals (current accruals not predicted by industry conditions). Discretionary current accruals are not independent of managerial optimism however. Teoh et al. (1998a) note that high discretionary current accruals may result from unintentional overoptimism by the managers about future cash flows. I control for the possibility that managerial optimism may be related to earnings management by including discretionary current accruals as an explanatory variable.

Finally, Ivanov et al. (2008) find that IPOs with higher venture capitalist reputation tend to have better long-run performance than IPOs with lower venture capitalist reputation. I control for this effect by including their measure of venture capital reputation in all of the regressions to ensure that the file-to-value ratio is not another proxy for venture capital reputation.

3. Data and Summary Statistics

3.1. Data

The initial sample is made up of 805 venture capital-backed IPO firms from 1987 to 2005, which have a venture capital post-round valuation available within two years of the filing date. The sample begins in 1987 because VC-backed IPOs with post-round valuations within 2

years of the filing date are sparse before this date, and ends in 2005 in order to allow for a 3 year period to calculate long-run performance. IPOs must be covered by the Center for Research in Security Prices (CRSP) within the first 30 days of the offer and also covered by Compustat, as well as have an offer price of at least $5 and have shares outstanding before the offer available, leaving 665 observations. Additionally, unit offerings, closed-end funds, American Depository Receipts (ADRs), Real Estate Investment Trusts (REITs), Shares of Beneficial Interest (SBIs) are eliminated, leaving 651 IPOs in the sample. Finally, I exclude the bubble period (1999-2000) observations following Das, Guo and Zhang (2006). Including this period would make it more difficult to disentangle the managerial optimism explanation from the market timing explanation, especially given that Ritter and Welch (2002) document that standard long-run return risk-adjustment techniques can produce very odd results for internet bubble IPOs. The final sample has 340 IPOs between 1987 and 2005 excluding the bubble period.

Data on the IPOs of ordinary common shares are obtained from the Securities Data Company's (SDC) New Issues database. Data on venture capital-backed IPOs such as round-by-round financing, post-round valuations, firm founding date, shares outstanding before the offer and the names of CEOs are obtained from the SDC's Venture Expert database. Share prices, returns, share codes and shares outstanding after the offer are obtained from CRSP. Accounting data are obtained from Compustat. Carter and Manaster (1990) underwriter reputation rankings updated by Professor Jay Ritter are obtained from Professor Jay Ritter's website.[11] Size and book-to-market portfolios as well as Fama and French (1993) factors are obtained from Professor Kenneth French's website.[12] Investor sentiment is obtained from Professor Jeffrey Wurgler's

[11] http://bear.cba.ufl.edu/ritter/ipodata.htm.
[12] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

website.[13] Finally, the chief executive officer's age and education are obtained from Hoovers. I supplement this data by hand collecting observations from Securities and Exchange Commission proxy filings.

3.2. Summary Statistics

Table 1 reports the summary statistics of firm, CEO and offer characteristics for the sample. File-to-Value (FTV) is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus shares filed, to the venture capital firm's valuation obtained within two years before the filing date. FTV is greater than 1 for about 91% of the sample, indicating that most IPOs are valued highly by managers at the file date. In fact, managers value their firm at 3.80 (2.78) times the venture capitalist value in mean (median). Overall, the IPOs in this sample are younger and larger, as measured by firm age (AGE) and market capitalization (MV), than the entire sample of firms which went public during the same time period. Further, they are predominantly technology firms (TECH) listed on the Nasdaq stock exchange (NASDAQ) and they retain high reputation firms as their lead underwriters (UWR). This is not surprising given this sample is entirely composed of VC-backed IPOs. When compared to all the VC-backed IPOs during the same period (not shown here), the sample used in this paper is actually quite representative. Some differences remain however. First, firms in this sample are still about 2 years younger and 50% larger than the overall sample of VC-backed IPOs. Second, there is a noticeable difference throughout the entire table between mean and median results. This asymmetry will be controlled for in two ways; (i) mean and median results will be examined throughout the paper; and (ii) the data will be winsorized at the 1 and 99% level to ensure that extreme outliers are not driving the results.[14]

[13] http://pages.stern.nyu.edu/~jwurgler/.
[14] The results remain qualitatively similar when the data is not winsorized.

Figure 1 plots the mean and median file-to-value ratio and the number of IPOs for each year between 1987 and 2005. Aside from the first five years, in which there are only a total of 7 IPOs, File-to-Value remains fairly consistent through time: mean values vary from 2.04 to 5.33, while median values vary from 1.76 to 3.97.

4. Managerial Optimism

In this section, the link between the file-to-value ratio and managerial optimism is explored. First, I look at whether any obvious firm or offer characteristics may explain the variation in the file-to-value ratio. Second, I look at the relationship between the file-to-value ratio and the price adjustment between the file date and the offer date, as well as the initial return on the first trading day and the total return between the file date and the first trading day. Recall from the discussion in Section 2, that more optimistic managers tend to overvalue their firm's future cash flows, or alternately undervalue the discount rate, either of which leads to a higher firm valuation relative to that of the market (Heaton (2002) and Malmendier and Tate (2005)). We should therefore observe that more optimistic managers have a lower price adjustment or a lower initial return or both. The results show that the file-to-value ratio does indeed capture this characteristic of optimistic managers.

Table 2 examines the firm characteristics of high, mid and low FTV portfolios, as well as a high minus low FTV zero-investment portfolio and all IPOs. Panel A reports mean results, where the numbers in parentheses are t-statistics based on simple t-tests for differences in means. Panel B reports median results, where the numbers in parentheses are t-statistics based on Wilcoxon-Mann-Whitney tests for differences in medians. Sales in the year of the offer are significantly greater for high FTV portfolios, both in mean and median, than they are for low

FTV portfolios. This may be one reason why managers are optimistic to begin with. Also, book-to-market is lower for high FTV portfolios than low FTV portfolios. This is not surprising given a positive relationship between managerial optimism and investor optimism (or growth opportunities) is expected. However, it is not likely to explain all of the variation in the file-to-value ratio: File-to-Value in the high FTV portfolio is about 5.2 times (3.9 times) higher in mean (median) than File-to-Value in the low FTV portfolio. There are no significant differences between high and low FTV portfolios for other firm characteristics such as firm age, assets, market capitalization, the proportion of technology firms and discretionary current accruals.

Table 3 examines the offer characteristics of high, mid and low FTV portfolios, as well as a high minus low FTV zero-investment portfolio and all IPOs. Panel A reports mean results, where the numbers in parentheses are t-statistics based on simple t-tests for differences in means. Panel B reports median results, where the numbers in parentheses are t-statistics based on Wilcoxon-Mann-Whitney tests for differences in medians. First, high FTV firms have significantly less reputable venture capitalists than low FTV firms, which may suggest that more reputable venture capitalists help to mitigate managerial optimism. I will control for this effect in multivariate regressions. Other variables show no significant or consistent variation across FTV portfolios. In particular, I find no significant differences in price adjustment, initial return and total return. However, given that many other variables have been found to influence these three variables, I will comment further in the multivariate analysis below.

Table 4 uses cross-sectional analysis to determine the impact of the file-to-value ratio on the price adjustment, initial return and total return, controlling for firm and offer characteristics that have been found to influence these variables.[15] Overall, I find that the file-to-value ratio is significantly negatively related to each of the three short-run returns: these negative relationships

[15] See Ritter and Welch (2002) and Ljungqvist (2007) for reviews of IPO pricing.

supports the idea that managers are indeed too optimistic in that they either overestimate their future cash flows or underestimate the discount rate, both of which lead to a higher file price relative to both the offer price and the market price.

The cross-sectional relationship with Price Adj in column 1 is formally tested using the following multivariate regression model:

$$Price\ Adj_i = \beta_0 + \beta_1 Ln(FTV_i) + \beta_2 Ln(1+AGE_i) + \beta_3 TECH_i + \beta_4 Ln(MV_i) + \beta_5 Ln(BV_i/MV_i)$$

$$+ \beta_6 VCR_i + \beta_7 UWR_i + \beta_8 NASDAQ_i + \beta_9 SENT_i + \varepsilon_i$$

The dependent variable, Price Adj, is the percentage increase in the offer price from the middle point in the filing range. FTV is the ratio of the middle point of the filing range multiplied by shares outstanding before the offer plus shares filed, to the venture capital firm's valuation obtained within two years before the filing date. AGE is the number of years between the IPO date and the company's founding date. TECH equals 1 if the firm is in a technology industry, and 0 otherwise. MV is the number of shares outstanding times the close price on the first day of trading, in millions of dollars. BV is the book value of equity in the year of the offer, in millions of dollars. VCR is the lead venture capitalist's (VC) IPO market share in the 3 years prior to the IPO year, where the IPO market share is the ratio of the gross proceeds excluding overallotments of the IPOs backed by the lead VC to those of all VCs.[16] UWR is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NASDAQ equals to 1 when the IPO is listed on the Nasdaq, and 0 otherwise. SENT is the Baker and Wurgler (2007) investor sentiment index for the month prior to the IPO. Finally, Ln signifies that I take the natural logarithm of the variable in question and the subscript *i* denotes that the variable is firm-

[16] Calculating VCR using the average reputation of all VCs backing the IPO instead of using the lead VC only does not change the results materially.

specific. The numbers in parentheses below the estimates are heteroscedasticity consistent t-statistics from an OLS regression. FTV is significantly and negatively related to Price Adj, suggesting that high FTV IPOs are priced closer to the offer price. Economically, a one standard deviation increase in Ln(FTV) is associated with a 2.2% decrease in Price Adj.

The cross-sectional relationship with Initial Return in column 2 is formally tested using the same multivariate regression model as above, except that Initial Return is the independent variable and Price Adj is included as an additional explanatory variable in order to see the impact of File-to-Value above and beyond its impact on Price Adj. Initial Return is the percentage increase in the first trading day closing market price from the offer price. FTV is significantly and negatively related to Initial Return, suggesting that high FTV IPOs are also priced closer to the market price. Economically, a one standard deviation increase in Ln(FTV) is associated with a 4.0% decrease in Initial Return.

The cross-sectional relationship with Total Return in column 3 is formally tested using the same multivariate regression model as above, except that Total Return is the independent variable. Total Return is the percentage increase in the first trading day closing market price from the middle point in the filing range. FTV is significantly and negatively related to Initial Return, suggesting that high FTV IPOs are also priced closer to the market price. While this conclusion is not surprising given the results in Columns 1 and 2, this regression gives an idea of the total impact that File-to-Value has on IPO pricing. Economically, a one standard deviation increase in Ln(FTV) is associated with a 8.8% decrease in Total Return.

5. Managerial Optimism and Long-Run Market Performance

This section examines whether there exists a relationship between managerial optimism and long-run market performance. I find that IPOs with more optimistic managers underperform IPOs with less optimistic managers in the 3 years following the offer. As will be shown, this result is robust to various benchmarks and risk-adjustment.

5.1. Portfolio Tests

Figure 2 plots the yearly buy-and-hold return of a high minus low FTV hedge portfolio, for Year 1, 2 and 3 after the offer. Panel A plots the yearly raw buy-and-hold return. Panel B plots the yearly market-adjusted buy-and-hold return. Panel C plots the yearly style-adjusted buy-and-hold return. Yearly Raw Buy-and-Hold Return (YBHR) is the IPO firm's one year buy-and-hold return using daily returns, starting the day after the offer, and 1 and 2 years after the offer. Market-Adjusted Buy-and-Hold Return is the difference between the IPO firm's YBHR and the YBHR from the CRSP equal-weighted index. Style-Adjusted Buy-and-Hold Return is the difference between the IPO firm's YBHR and the YBHR from an equal-weighted portfolio matched on size and book-to-market. The plots show that high FTV firms underperform low FTV firms in each of the first three years after the offer, irrespective of the reference portfolio used. On a style-adjusted basis, high FTV firms underperform low FTV firms in mean by 22.30%, 47.79% and 26.30% in Year 1, 2 and 3 after the offer, respectively. For medians, the equivalent numbers are 12.64%, 18.69% and 15.66%.

Table 5 reports the cumulative buy-and-hold returns of high, mid and low FTV portfolios, as well as a high minus low FTV zero-investment portfolio and all IPOs, for 1, 2 and 3-Year periods after the offer. Panel A reports mean results, where the numbers in parentheses are t-statistics based on simple t-tests for differences in means. Panel B reports median results, where the numbers in parentheses are t-statistics based on Wilcoxon-Mann-Whitney tests for

differences in medians. Raw Buy-and-Hold Return (BHRt) is the IPO firm's buy-and-hold return using daily returns, starting the day after the offer and ending t=1, 2 and 3 years later or the on the delisting date, whichever is earlier.[17] Market-Adjusted Buy-and-Hold Return is the difference between the IPO firm's BHRt and the BHRt from the CRSP equal-weighted index, for t=1, 2 and 3 years. Style-Adjusted Buy-and-Hold Return is the difference between the IPO firm's BHRt and the BHRt from an equal-weighted portfolio matched on size and book-to-market, for t=1, 2 and 3 years. Except for the 1-Year median returns, all of the high FTV portfolios significantly underperform the low FTV portfolios in mean and median, irrespective of the reference portfolio used. Moreover, the decrease in market performance is monotonic across portfolios. The strongest underperformance overall can be found in the 3-year buy-and-hold returns: high FTV firms underperform low FTV firms by about 61% (42%) in mean (median) on a style-adjusted basis. These numbers are significant at the 10% level.

5.2. Regression Analysis

Table 6 uses cross-sectional analysis to determine the impact of File-to-Value on long-run risk-adjusted returns, controlling for firm and offer characteristics that have been found to influence long-run market performance. The cross-sectional relationship with long-run risk-adjusted returns is tested using the following multivariate regression model:

$$Alpha_i = \beta_0 + \beta_1 Ln(FTV_i) + \beta_2 Ln(1+AGE_i) + \beta_3 TECH_i + \beta_4 Ln(MV_i) + \beta_5 Ln(BV_i/MV_i)$$

$$+ \beta_6 VCR_i + \beta_7 UWR_i + \beta_8 NASDAQ_i + \beta_9 SENT_i + \beta_{10} DCA_i + \varepsilon_i$$

The dependent variable is the long-run risk-adjusted return. It is calculated using the event-time risk-adjusted returns method based on the Fama and French (1993) three-factor model, following Purnanandam et al. (2004). Specifically, each IPO's monthly excess returns (in excess of the 1-

[17] I use the delisting returns if these are available in CRSP after the delisting date.

month Treasury bill return) from one month after the IPO date until the end of the holding period (1, 2 or 3 years) or the delisting date, whichever is earlier, is regressed on the Fama and French factors ($R_m - R_f$, SMB, HML) for the same period. $R_m - R_f$, the excess return on the market, is the value-weighted return on all NYSE, AMEX, and NASDAQ stocks minus the 1-month Treasury bill rate. SMB (Small minus Big) is the average return on the three small portfolios minus the average return on the three big portfolios. HML (High minus Low) is the average return on the two value portfolios minus the average return on the two growth portfolios. The risk-adjusted return is the intercept from this regression, Alpha. DCA is the discretionary current accruals in the year of the IPO, as calculated in Teoh et al. (1998a).[18] The other independent variables are defined above. Finally, Ln signifies that I take the natural logarithm of the variable in question and the subscript *i* denotes that the variable is firm-specific. The numbers in parentheses below the estimates are heteroscedasticity consistent t-statistics from an OLS regression. Two models are examined: Model 1 excludes DCA, while Model 2 includes it. This is done for two reasons. First, the sample size is much smaller when including DCA. Second, as mentioned in the introduction, DCA and managerial optimism are not independent. As such, DCA may also be capturing managerial optimism to some extent. Overall, I find a negative and significant relationship between the file-to-value ratio and long-run risk-adjusted returns. The coefficients on File-to-Value are all significant at the 5% level for 1, 2 and 3-Year Alpha for both models. Economically, for a 3 year period, a one standard deviation increase in Ln(FTV) in Model 1 leads to a 30.60% decrease (−0.85% per month × 36 months) in risk-adjusted returns. For 1 and 2 year periods, a one standard deviation increase in Ln(FTV) leads to 14.37% and 22.81%

[18] In short, expected current accruals (nondiscretionary) are calculated using the estimated coefficients from a cross-sectional regression of current accruals on change in sales using a sample of all two-digit SIC code peers in the year of the IPO, except for firms conducting an IPO or SEO in that year. Unexpected current accruals (discretionary) are found by subtracting expected current accruals from current accruals.

decreases in risk-adjusted returns, respectively. Note that for 2 and 3-Year alphas, DCA is indeed significantly negative, which is what would be predicted by both earnings management and managerial optimism. Other variables are fairly consistent with the literature. One exception is VCR, which is insignificant. I also tried the average venture capital reputation instead of the lead venture capital reputation. Using average VCR produces more significant results, although they are still not significant at the 10% level. The lack of explanatory power may be due to the relatively small sample examined here. Another exception is SENT, which is significantly positive in three of the six regressions. Baker and Wurgler (2006) find that a wave of investor sentiment has large negative effects on securities whose valuations are highly subjective and difficult to arbitrage. One explanation for the result in this paper may be that because the IPOs in this sample are about twice the size of IPOs in the overall sample, they are easier to value and/or arbitrage, and therefore investor sentiment is not necessarily negatively related to long-run market performance.

6. Managerial Optimism and Long-Run Operating Performance

In this section, long-run operating performance, investment and leverage are analyzed to determine whether the long-run return differentials found in the last section might be the result of overinvestment or underinvestment on the part of optimistic managers.[19] Optimistic managers are at greater risk of overinvesting/underinvesting because they tend to overestimate the future cash flows of their projects or underestimate the discount rate. This leads them to overinvest when they believe that they are investing in positive NPV projects when they are in fact investing in negative NPV projects. Alternatively, this leads them to underinvest when they

[19] I use similar operating performance measures as Loughran and Ritter (1997) and Purnanandam et al. (2004), as well as earnings per share because of its importance to investors.

decline positive NPV projects that must be financed externally, because they believe that markets undervalue their firm's risky securities. The evidence that will be provided supports the latter conclusion.

Table 7 reports median operating performance for IPO firms sorted into high, mid and low FTV portfolios, as well as a high minus low FTV zero-investment portfolio and all IPOs, for the first three fiscal years after the offer as well as the year of the offer (Year 0). Operating performance is industry-adjusted using the median value in the same 2-digit SIC code group and in the same fiscal year, excluding firms that had an IPO or SEO. Panel A reports earnings per share, Panel B reports return on assets (Net Income/Assets), Panel C reports cash flow return on assets (Cash Flow/Assets) and Panel D reports profit margin (Net Income/Sales). Overall, I find that high FTV firms have significantly better operating performance in Year 0 than low FTV firms. This relationship does not last however; in Year 1 and Year 2, high FTV firms outperform low FTV firms by a smaller margin and with less (or no) significance; and by Year 3, high FTV firms no longer reliably outperform low FTV firms. More specifically, high FTV firms have \$0.69 greater earnings per share, 46.73% greater return on assets, 36.36% greater cash flow return on assets and 24.37% greater profit margin than low FTV firms in Year 0, with all of these differences being significant at the 1% level (except for profit margin, which is significant at the 5% level). By Year 3, these numbers are \$0.21, 10.32%, 6.18% and 12.37%, respectively, with none of these differences being significant at the 10% level. The industry-adjusted results are quantitatively and qualitatively very similar. The fact that operating performance in Year 0 is much better for high FTV firms than for low FTV firms makes managerial optimism a more likely explanation for the findings in this paper than the market timing explanation: high FTV

firms' valuation are justified given they have much stronger initial operating performance than low FTV firms.

Table 8 reports the accruals for IPO firms sorted into high, mid and low FTV portfolios, as well as a high minus low FTV zero-investment portfolio and all IPOs, for the first three fiscal years after the offer as well as the year of the offer (Year 0). Investment and leverage are industry-adjusted using the median value in the same 2-digit SIC code group and in the same fiscal year, excluding firms that had an IPO or SEO. Panel A reports investment (Capital Expenditures + Research & Development) to assets, Panel B reports long-term debt to assets, and Panel C reports total debt (debt portion of current liabilities + long-term debt) to assets. I find that high FTV firms have significantly less investment as a proportion of assets than low FTV firms in Year 0, Year 1 and Year 2. Specifically, Investment to Assets is 10.77%, 8.32% and 6.79% lower in those three years, while it is insignificantly different from zero in Year 3. Instead, managers are paying down debt: both Long-Term Debt to Assets and Total Debt to Assets are significantly lower in Year 2 and Year 3 for high FTV firms than for low FTV firms. In Year 3, Long-Term Debt to Assets is 2.91% lower for high FTV firms than for low FTV firms, while Total Debt to Assets is 7.12% lower. Moreover, it appears that this trend is driven by the high FTV firms who reduce their Total Debt to Assets from 5.47% in Year 0 to 0.40% in Year 3, while low FTV firms increase theirs from 6.52% to 7.52% over the same period. The industry-adjusted equivalent measures show similar patterns.

7. Robustness Tests

In this section, I will examine the sensitivity of the main results to some of the assumptions made in using the file-to-value ratio as a measure of managerial optimism. Namely,

I will examine whether an errors-in-variables problem is leading to inconsistent parameter estimates, and whether the delay between the venture capital valuation date and the file date is driving the file-to-value ratio.

7.1. Errors-in-Variables

Using the file-to-value ratio as a measure of managerial optimism can lead to a classic errors-in-variables problem. Because the file-to-value ratio, which is constructed with firm and offer characteristics, is an imperfect measure of managerial optimism, it is likely that the measurement error will cause the regression coefficient to be biased toward zero and inconsistent. To address this measurement error problem, I use two other exogenous variables which are manager specific, the chief executive officer's age and education, as instrumental variables in a first stage regression. In the second stage regressions, I will use the predicted value from the first stage regression to explain long-run risk-adjusted performance. The main findings from this exercise are that a CEO's education does explain a small portion of the variation in the file-to-value ratio, and that the conclusion that the IPOs of more optimistic managers underperform those of less optimistic managers does not change using the instrumental variables approach.

7.1.1. Predicted Managerial Optimism

Table 9 reports the coefficients from the regression of the file-to-value ratio on a CEO's age and education. The cross-sectional relationship with File-to-Value is formally tested using the following multivariate regression model:

$$Ln(FTV_i) = \beta_0 + \beta_1 Ln(CEO\ AGE_i) + \beta_2\ CEO\ EDUCATION_i + \varepsilon_i$$

The dependent variable, FTV, is defined above. CEO AGE is the chief executive officer's age at the time of the IPO. CEO EDUCATION equals 0 if the CEO has no degree, 1 if the CEO has a

bachelor's degree, 2 if the CEO has a master's degree, and 3 if the CEO has a doctorate. Finally, Ln signifies that I take the natural logarithm of the variable in question and the subscript *i* denotes that the variable is firm-specific. The numbers in parentheses below the estimates are heteroscedasticity consistent t-statistics from an OLS regression.

Model 1 reports the impact of CEO AGE on File-to-Value. I find no significant relationship between a CEO's age and the file-to-value ratio. Landier and Thesmar (2009) find that entrepreneurs with higher non-entrepreneurial outside options exhibit more optimism, while those receiving more accurate signals on projects have smaller biases. CEO age has an ambiguous interpretation because older CEOs may have more outside options as well as more accurate signals on projects, given their experience. The result in Model 1 is consistent with this ambiguity. Model 2 reports the impact of CEO EDUCATION on File-to-Value. A CEO's education is significantly and negatively related to the file-to-value ratio. This is the opposite of the result found in Landier and Thesmar's sample of French entrepreneurs. One possible reason for this difference is that CEO education in this paper may reflect expertise, which Landier and Thesmar find has a negative relationship with optimism because of its association with more accurate signals. Indeed, an informal look at the specialization of CEO doctoral degrees suggests that many could be considered experts in their field.[20] A further consequence of this specialization may be that non-entrepreneurial outside options are limited, which would also lead to less optimism. Model 3 incorporates both the CEO's age and education. While CEO AGE remains statistically insignificant at the 10% level, CEO EDUCATION becomes slightly more significant and the model's explanatory power increases. Therefore, the predicted value from Model 3 will be used as an independent variable in the second stage regressions. While the

[20] A few examples of PhD specializations are: Solid State Science, Electrophysics, Physical Chemistry, Organic Chemistry, Computer Science, Microbiology, Molecular Pharmacology, Immunology, Metallurgy, Electrical Engineering and Biochemistry.

Model 3 coefficient on CEO EDUCATION is significant at the 5% level, the regression's R-square of 1.5% suggests that it does not explain a great deal of the overall variation in Ln(FTV). However, for the instrumental variables approach to be effective, this need not be the case: more important is that there is a significant correlation between File-to-Value and its instrument.

7.1.2. Predicted Managerial Optimism and Long-Run Market Performance

Table 10 uses cross-sectional analysis to determine the impact of the predicted file-to-value ratio on long-run risk-adjusted returns, controlling for firm and offer characteristics that have been found to influence long-run market performance. The cross-sectional relationship with long-run risk-adjusted returns is tested using the following multivariate regression model:

$$Alpha_i = \beta_0 + \beta_1 PFTV_i + \beta_2 Ln(1+AGE_i) + \beta_3 TECH_i + \beta_4 Ln(MV_i) + \beta_5 Ln(BV_i/MV_i)$$

$$+ \beta_6 VCR_i + \beta_7 UWR_i + \beta_8 NASDAQ_i + \beta_9 SENT_i + \beta_{10} DCA_i + \varepsilon_i$$

The model is the same as the one used in Section 5.2., with the exception that Predicted File-to-Value (PFTV) is used in place of Ln(FTV). PFTV is the predicted value from the Model 3 regression from Section 7.1.1. Other variables are defined above. Finally, Ln signifies that I take the natural logarithm of the variable in question and the subscript *i* denotes that the variable is firm-specific. The numbers in parentheses below the estimates are heteroscedasticity consistent t-statistics from an OLS regression. As in Section 5.2., two models are examined: Model 1 excludes DCA, while Model 2 includes it. One notable difference from Table 6 is that the 1-Year regression PFTV coefficient estimate is insignificant.[21] However, the statistical and economic significance of the PFTV coefficient estimates for the 2 and 3-Year regressions are very similar

[21] Also, remarkable is the negative R-square in the 1-Year regression for Model 2. Wooldridge (2003) explains that unlike the case of Ordinary Least Squares, the R-square from Instrumental Variables (IV) estimation can be negative because the Sum of Squared Residuals for IV can actually be larger than the Total Sum of Squares.

to those in table 6, which again supports the conclusion that higher managerial optimism is associated with worse long-run risk-adjusted performance.[22]

7.2. Sensitivity Analysis

The International Private Equity and Venture Capital Valuation Guidelines (2006) note the following in reference to the "Price of Recent Investment" valuation methodology,

> *"The validity of a valuation obtained in this way is inevitably eroded over time, since the price at which the Investment was made reflects the effects of conditions that existed when the transaction took place. In a dynamic environment, changes in market conditions, the passage of time itself and other factors will diminish the appropriateness of this valuation methodology as a means of estimating value at subsequent dates."*

As such, the passage of time, the venture capital round financing received between the venture capital valuation date and the filing date, market returns and volatility between the venture capital valuation date and the filing date, and industry returns and volatility between the venture capital valuation date and the filing date will all be examined as variables that may potentially explain the variation in the file-to-value ratio in a first stage regression. In the second stage regressions, I will use the residual from the first stage regression to explain long-run risk-adjusted performance. The main findings from this exercise are that the passage of time does explain a small portion of the variation in the file-to-value ratio, but that none of these variables

[22] While the 2 and 3-Year regression coefficient estimates on PFTV are much higher than those on Ln(FTV) in Table 6, the economic significance is similar because the variability of PFTV is correspondingly lower. Specifically, the standard deviation of Ln(FTV) is 0.7727, while the standard deviation of PFTV is 0.1123.

change the conclusion that the IPOs of more optimistic managers underperform those of less optimistic managers.[23]

7.2.1. Residual Managerial Optimism

Table 11 reports the coefficients from the regression of the file-to-value ratio on changes in firm and market conditions between the venture capital valuation date and the filing date, as well as the passage of time itself. The cross-sectional relationship with File-to-Value is formally tested using the following multivariate regression model:

$$Ln(FTV_i) = \beta_0 + \beta_1 Ln(DELTA_i) + \beta_2 Ln(RVAL_i) + \beta_3 MBHR_i + \beta_4 MVOL_i + \beta_5 IBHR_i$$

$$+ \beta_6 IVOL_i + \varepsilon_i$$

The dependent variable, FTV, is defined above. DELTA is the number of days between the venture capital valuation date and the filing date. RVAL is the total amount of venture capital financing received by the IPO firm between the venture capital valuation date and the filing date. MBHR is the buy-and-hold return from the CRSP equal-weighted index between the venture capital valuation date and the filing date. MVOL is the volatility from the CRSP equal-weighted index between the venture capital valuation date and the filing date. IBHR is the buy-and-hold return from the IPO firm's industry portfolio between the venture capital valuation date and the filing date. IVOL is the volatility from the IPO firm's industry portfolio between the venture capital valuation date and the filing date. Finally, Ln signifies that I take the natural logarithm of the variable in question and the subscript *i* denotes that the variable is firm-specific. The numbers

[23] Given that the passage of time is significantly and positively related to the file-to-value ratio, I also tried changing the allowable time between the venture capital valuation date and the filing date as an additional robustness test. The results remain qualitatively similar when using an 18 or 30 month window (instead of a 24 month window) between the venture capital valuation date and the filing date.

in parentheses below the estimates are heteroscedasticity consistent t-statistics from an OLS regression.

Model 1 reports the impact of venture capital-specific characteristics on File-to-Value. As suggested in the caveats of this method of valuation, the farther away the venture capital valuation date is from the filing date, the greater the is the file-to-value ratio. While the coefficient on Ln(DELTA) is significant at the 1% level, the regression's R-square of 4.9% suggests that it does not explain much of the overall variation in Ln(FTV). The amount of venture capital funding received between the venture capital valuation date and the filing date is insignificant in explaining File-to-Value. Model 2 reports the impact of changes in market conditions on File-to-Value. The market return between the venture capital valuation date and the filing date is positively and significantly related to File-to-Value. The market volatility however, is insignificant. Model 3 examines the industry-level equivalents of the market variables in Model 2 to determine whether they also have some power in explaining some of the variation in FTV. Neither the industry return, nor the industry volatility between the venture capital valuation date and the filing date are significant explanatory variables. Model 4 incorporates all of the independent variables from models 1 to 3. Remarkable is the fact that MBHR has no explanatory power above and beyond that of DELTA, and that very little of the variation in File-to-Value is explained overall.

7.2.2. Residual Managerial Optimism and Long-Run Market Performance

Table 12 uses cross-sectional analysis to determine the impact of the residual file-to-value ratio on long-run risk-adjusted returns, controlling for firm and offer characteristics that have been found to influence long-run market performance. The cross-sectional relationship with long-run risk-adjusted returns is tested using the following multivariate regression model:

$$Alpha_i = \beta_0 + \beta_1 RFTV_i + \beta_2 Ln(1+AGE_i) + \beta_3 TECH_i + \beta_4 Ln(MV_i) + \beta_5 Ln(BV_i/MV_i)$$

$$+ \beta_6 VCR_i + \beta_7 UWR_i + \beta_8 NASDAQ_i + \beta_9 SENT_i + \beta_{10} DCA_i + \varepsilon_i$$

The model is the same as the one used in Section 5.2., with the exception that Residual File-to-Value (RFTV) is used in place of Ln(FTV).[24] RFTV is the residual from the Model 4 regression from Section 7.2.1. Other variables are defined above. Finally, Ln signifies that I take the natural logarithm of the variable in question and the subscript *i* denotes that the variable is firm-specific. The numbers in parentheses below the estimates are heteroscedasticity consistent t-statistics from an OLS regression. As in Section 5.2., two models are examined: Model 1 excludes DCA, while Model 2 includes it. The coefficient estimates, statistical significance and economic significance are very similar to those in table 6, which again supports the conclusion that higher managerial optimism is associated with worse long-run risk-adjusted performance.

8. Conclusions

This paper tries to determine whether the long-run underperformance, which has been found empirically in IPOs, can be explained in part by the level of optimism of firm managers. I find that IPOs with more optimistic managers underperform IPOs with less optimistic managers in the long-run. Moreover, the IPOs of the most optimistic managers underperform in the long-run when compared to a benchmark portfolio or even on a factor-adjusted basis, while the IPOs of the least optimistic manager do not. In terms of operating performance, firms with the most optimistic managers perform well at the time of the offer, thus justifying their high valuation relative to firms with the least optimistic managers. This operating performance advantage

[24] As an additional robustness test, I also tried using Ln(FTV) instead of RFTV, and including all of the independent variables from Model 4 as additional independent variables in the regressions on 1, 2 and 3-Yr Alphas. The coefficient estimates on Ln(FTV) along with their significance levels did not change materially.

disappears over time however because optimistic managers invest too little in the years after the offer. Instead, optimistic managers choose to pay off their short and long-term debt, suggesting that their underperformance is driven by underinvestment. One potential explanation for the results found in this paper is that managers are timing the market. Optimistic managers unwittingly price their issue at a high value because they overestimate their future cash flows or underestimate the discount rate, whereas market timing managers realize that their assets are overvalued in the market, and price their offer high to take advantage of this misvaluation. I control for this alternate explanation by including firm, industry and market-level variables of investor optimism and uncertainty that may be at the root of the misvaluation which managers would potentially take advantage of. Additionally, I limit the sample to IPOs issued during low investor sentiment periods and find that results are actually slightly stronger on this subsample. Another potential explanation is that long-run market performance is driven by current accruals (Teoh et al. (1998a)). Managers can increase current accruals by, for example, advancing recognition of revenues with credit sales before cash is received or by delaying the recognition of expenses when cash is advanced to suppliers. While the source of earnings management could be optimistic managers, I still control for this effect by including a measure of discretionary current accruals as an explanatory variable. Lastly, Ivanov et al. (2008) find that IPOs with higher venture capitalist reputation tend to have better long-run performance than IPOs with lower venture capitalist reputation. I control for this effect by including their measure of venture capital reputation in all of the regressions to ensure that the file-to-value ratio is not another proxy for venture capital reputation.

This paper contributes to the IPO literature by documenting empirically for the first time a role for managerial optimism in explaining the long-run performance of IPOs. This relationship

is driven by optimistic managers who underinvest in their firm in the years after the offer, instead choosing to pay down their company's short and long-term debt. This is also the first time that underinvestment has been found in a sample of IPOs, which may not be surprising given these firms are precisely the types of firms which are not likely to have sufficient internal funds to subsidize all of their prospective projects. The results suggest some avenues for future work. In particular, can the findings in this paper be extended to other types of financing arrangements? Also, can the theoretical link between overinvestment/underinvestment and long-run underperformance be made more explicit? These questions are left to future research.

Bibliography

Association Française des Investisseurs en Capital (AFIC), British Venture Capital Association (BVCA), and European Private Equity and Venture Capital Association (EVCA), 2006, International Private Equity and Venture Capital Valuation Guidelines, http://www.privateequityvaluation.com/documents/International_PE_VC_Valuation_Guidelines_Oct_2006.pdf, Edition October 2006.

Baker, Malcolm, Richard S. Ruback, and Jeffrey Wurgler, 2007, Behavioral Corporate Finance, Handbook of Corporate Finance: Empirical Corporate Finance, Vol. 1, Elsevier/North-Holland, Chapter 4.

Baker, Malcolm, and Jeffrey Wurgler, 2006, Investor Sentiment and the Cross-Section of Stock Returns, *Journal of Finance*, 61, 1645-1680.

Bayless, Mark, and Suzan Chaplinsky, 1996, Is There a Window of Opportunity for Seasoned Equity Issuance?, *Journal of Finance*, 51, 253-278.

Brau, James C., Patricia A. Ryan, and Irv DeGraw, 2006, Initial Public Offerings: CFO Perceptions, *Financial Review*, 41, 483-511.

Brav, Alon, Christopher Geczy, and Paul A. Gompers, 2000, Is the Abnormal Return Following Equity Issuances Anomalous?, *Journal of Financial Economics*, 56, 209-249.

Brav, Alon and Paul A. Gompers, 1997, Myth or Reality? The Long-Run Underperformance of Initial Public Offerings: Evidence from Venture and Nonventure Capital-Backed Companies, *Journal of Financial Economics*, 52, 1791-1821.

Carter, Richard, and Steven Manaster, 1990, Initial Public Offerings and Underwriter Reputation, *Journal of Finance*, 45, 1045-1067.

Cooney, John W., Thomas Moeller, and Mike Stegemoller, 2008, The Underpricing of Private Targets, *Journal of Financial Economics*, Forthcoming.

Cornelli, Francesca, David Goldreich, and Alexander Ljungqvist, 2006, Investor Sentiment and Pre-IPO Markets, *Journal of Finance* 61, 1187-1216.

Daniel, K. D., D. Hirshleifer, and A. Subrahmanyam, 1998, Investor psychology and security market under- and overreactions, *Journal of Finance*, 53, 1839-1886.

Das, Somnath, Re-Jin Guo, and Huai Zhang, 2006, Analysts' Selective Coverage and Subsequent Performance of Newly Public Firms, *Journal of Finance*, 61, 1159-1189.

Derrien, Francois, 2005, IPO Pricing in "Hot" Market Conditions: Who Leaves Money on the Table?, *Journal of Finance* 60, 487-521.

Dong, Ming, and Jean-Sebastien Michel, 2008, Does Investor Heterogeneity Lead to IPO Overvaluation?, Working Paper.

Eckbo, B. Espen, Ronald W. Masulis, and Oyvind Norli, 2007, Security Offerings, Handbook of Corporate Finance: Empirical Corporate Finance, Vol. 1, Elsevier/North-Holland, Chapter 6.

Fama Eugene F., and Kenneth R. French, 1993, Common Risk Factors in the Returns on Stocks and Bonds, *Journal of Financial Economics*, 33, 3-56.

Heaton, J.B., 2002, Managerial Optimism and Corporate Finance, *Financial Management*, 31, 33-45.

Houge, Todd, Tim Loughran, Gerry Suchanek, and Xuemin Yan, 2001, Divergence of Opinion, Uncertainty, and the Quality of Initial Public Offerings, *Financial Management*, 30, 5-23.

Ivanov, Vladimir I., Krishnan, C.N.V., Masulis, Ronald W., and Ajai K. Singh, 2008, IPOs and Venture Capital Reputation, Working Paper.

Landier, Augustin, and David Thesmar, 2009, Financial Contracting with Optimistic Entrepreneurs, *Review of Financial Studies*, 22, 117-150.

Ljungqvist, Alexander, 2007, IPO Underpricing, Handbook of Corporate Finance: Empirical Corporate Finance, Vol. 1, Elsevier/North-Holland, Chapter 7.

Ljungqvist, Alexander, Vikram Nanda, and Rajdeep Singh, 2006, Hot Markets, Investors Sentiment, and IPO Pricing, *Journal of Business,* 79, 1667.

Loughran, Tim, and Jay R. Ritter, 1995, The New Issues Puzzle, *Journal of Finance*, 50, 23-51.

Loughran, Tim, and Jay R. Ritter, 1997, The Operating Performance of Firms Conducting Seasoned equity Offerings, *Journal of Finance*, 52, 1823-1850.

Malmendier, Ulrike, and Geoffrey Tate, 2005, CEO Overconfidence and Corporate Investment, *Journal of Finance*, 60, 2661-2700.

Miller, Edward M., 1977, Risk, Uncertainty, and Divergence of Opinion, *Journal of Finance* 32, 1151-1168.

Purnanandam, Amiyatosh K., and Bhaskaran Swaminathan, 2004, Are IPOs Really Underpriced?, *Review of Financial Studies*, 17 811-848.

Ritter, Jay R., 1991, The Long-Run Performance of Initial Public Offerings, *Journal of Finance*, 46, 3-27.

Ritter, Jay R., and Ivo Welch, 2002, A Review of IPO Activity, Pricing, and Allocations, *Journal of Finance*, 57, 1795-1828.

Shleifer, Andrei, and Robert W. Vishny, 1997, The Limits of Arbitrage, *Journal of Finance*, 52, 35-55.

Teoh, Siew Hong, Ivo Welch, and T.J. Wong, 1998a, Earnings Management and the Long-Run Market Performance of Initial Public Offerings, *Journal of Finance*, 53, 1935-1974.

Teoh, Siew Hong, Ivo Welch, and T.J. Wong, 1998b, Earnings Management and the Underperformance of Seasoned Equity Offerings, *Journal of Financial Economics*, 50, 63-99.

Wooldridge, Jeffrey M., 2003, Introductory Econometrics: A Modern Approach, 2nd Edition, Thomson/South-Western, Chapter 15.

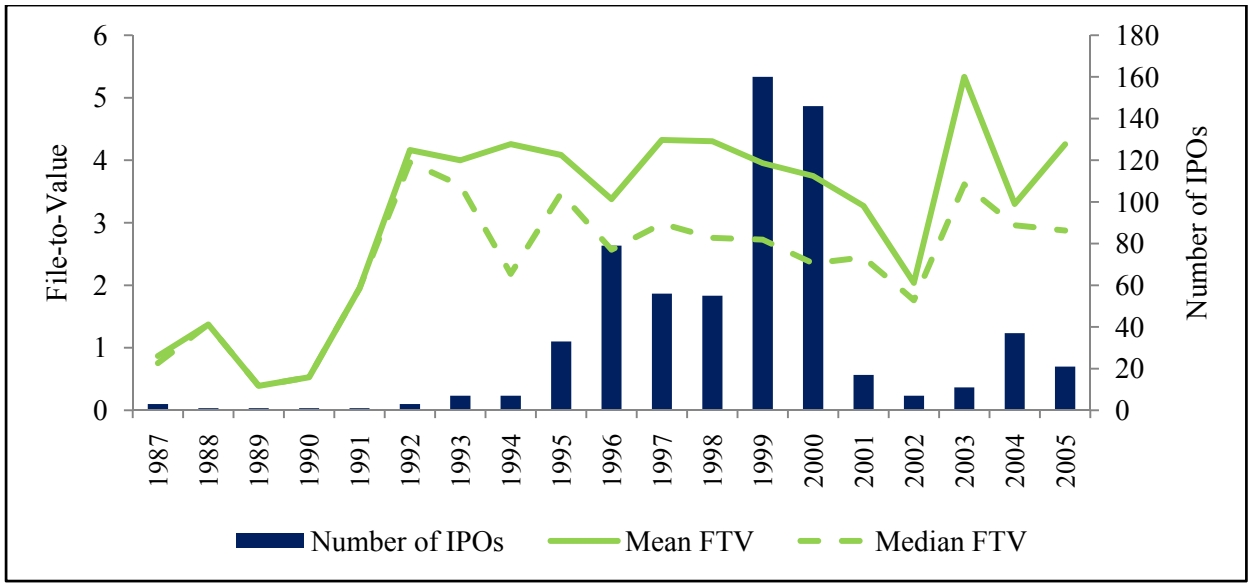
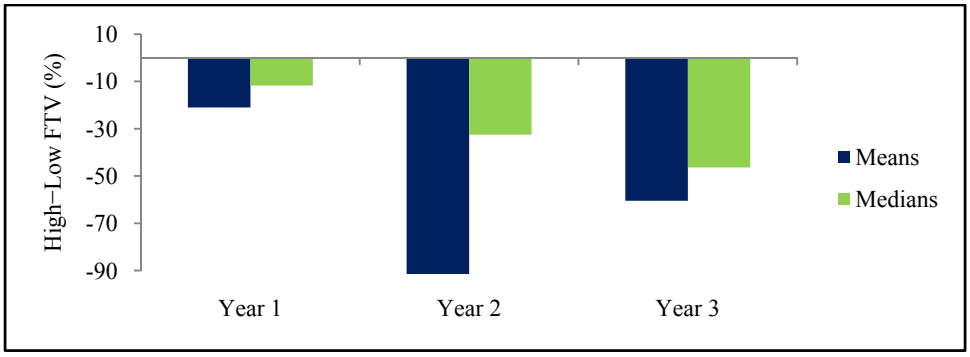


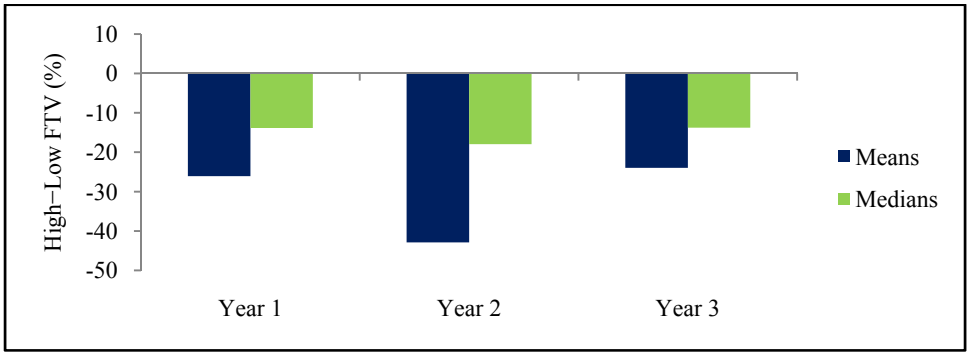
Figure 1: Annual File-to-Value and Number of IPOs

This figure plots mean and median File-to-Value and Number of IPOs from 1987 to 2005. FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date.

Panel A: Yearly Raw Buy-and-Hold Return



Panel B: Yearly Market-Adjusted Buy-and-Hold Return



Panel C: Yearly Style-Adjusted Buy-and-Hold Return

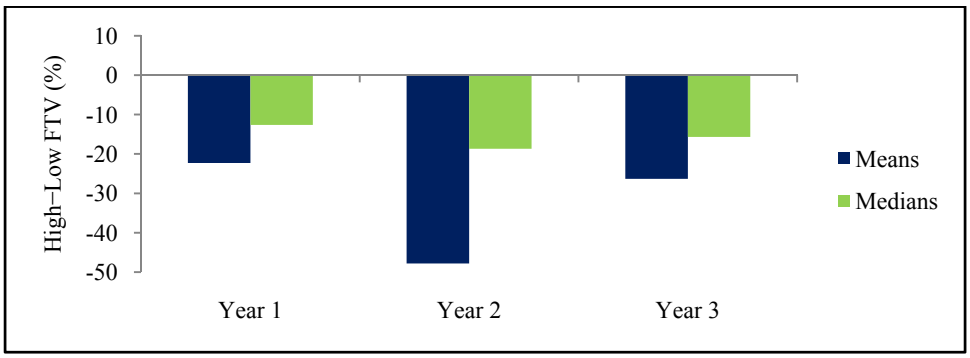


Figure 2: Yearly Buy-and-Hold Return Differential between High and Low File-to-Value Portfolios
Figure 2 plots the yearly buy-and-hold return of a High–Low FTV hedge portfolio, for Year 1, 2 and 3 after the offer. Panel A plots the yearly raw buy-and-hold return. Panel B plots the yearly market-adjusted buy-and-hold return. Panel C plots the yearly style-adjusted buy-and-hold return. FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. Yearly Raw Buy-and-Hold Return (YBHR) is the IPO firm's one year buy-and-hold return using daily returns, starting the day after the offer, and 1 and 2 years after the offer. Market-Adjusted Buy-and-Hold Return is the difference between the IPO firm's YBHR and the YBHR from the CRSP equal-weighted index. Style-Adjusted Buy-and-Hold Return is the difference between the IPO firm's YBHR and the YBHR from an equal-weighted portfolio matched on size and book-to-market.

Table 1: Summary Statistics of Firm, CEO and Offer Characteristics

FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. Sales (item 12) and Assets (item 6) are measured in millions of dollars in the year of the IPO. AGE is the number of years between the IPO date and the company's founding date. TECH equals 1 if the firm is in a high-tech industry, and 0 otherwise. MV is the number of shares outstanding times the close price on the first day of trading, in millions of dollars. BV is the book value of equity in the year of the IPO, in millions of dollars. DCA is the discretionary current accruals in the year of the IPO, as calculated in Teoh et al. (1998a). CEO AGE is the Chief Executive Officer's age at the time of the IPO. CEO EDUCATION equals 0 if the CEO has no degree, 1 if the CEO has a bachelor's degree, 2 if the CEO has a master's degree, and 3 if the CEO has a doctorate. VCR is the lead venture capitalist's (VC) IPO market share in the 3 years prior to the IPO year. The IPO market share is the ratio of the gross proceeds excluding overallotments of the IPOs backed by the lead VC to those of all VCs. UWR is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NASDAQ equals to 1 when the IPO is listed on the Nasdaq, and 0 otherwise. SENT is the Baker and Wurgler (2007) investor sentiment index for the month prior to the IPO. Price Adj is the percentage increase in the offer price from the middle point in the filing range. Initial Return is the percentage increase in the first trading day closing market price from the offer price. Total Return is the percentage increase in the first trading day closing market price from the middle point in the filing range. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

Variables	N	Mean	Std Dev	25%	Median	75%
Panel A: Firm and CEO Characteristics						
FTV	340	3.80	3.27	1.79	2.78	4.51
Sales	340	73.27	145.49	5.89	26.72	68.71
Assets	340	117.45	213.14	33.43	62.88	105.52
AGE	327	6.78	6.13	3.00	5.00	8.00
TECH	340	0.84	0.37	1.00	1.00	1.00
MV	340	315.13	387.17	112.11	186.18	340.04
BV/MV	340	0.25	0.16	0.16	0.24	0.32
DCA	277	0.31	67.03	−15.13	−0.91	16.65
Panel B: CEO Characteristics						
CEO AGE	259	44.53	7.22	39.00	45.00	49.00
CEO EDUCATION	269	1.51	0.99	1.00	2.00	2.00
Panel C: Offer Characteristics						
VCR	317	1.27	0.99	0.47	0.99	2.12
UWR	303	7.90	1.53	8.00	8.00	9.00
NASDAQ	340	0.90	0.30	1.00	1.00	1.00
SENT	340	0.29	0.49	−0.01	0.32	0.60
Price Adj (%)	340	0.12	25.72	−17.63	0.00	16.33
Initial Return (%)	340	21.34	27.86	1.04	14.85	29.97
Total Return (%)	340	26.70	60.50	−15.92	11.27	52.18

Table 2: Summary Firm Characteristics of File-to-Value Portfolios

FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. Sales (item 12) and Assets (item 6) are measured in millions of dollars in the year of the IPO. AGE is the number of years between the IPO date and the company's founding date. TECH equals 1 if the firm is in a high-tech industry, and 0 otherwise. MV is the number of shares outstanding times the close price on the first day of trading, in millions of dollars. BV is the book value of equity in the year of the offer, in millions of dollars. DCA is the discretionary current accruals in the year of the IPO, as calculated in Teoh et al. (1998a). The numbers in parentheses are t-statistics based on simple t-tests for differences in means, and Wilcoxon-Mann-Whitney tests for differences in medians. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	FTV	Sales	Assets	AGE	TECH	MV	BV/MV	DCA
Panel A: Means								
Low FTV	1.40	60.64	110.18	6.44	0.82	273.24	0.28	11.82
Mid FTV	2.81	65.70	114.47	6.55	0.92	327.18	0.24	−11.40
High FTV	7.21	93.54	127.72	7.37	0.78	344.87	0.23	−0.12
High−Low FTV	5.81***	32.90*	17.54	0.93	−0.04	71.63	−0.05**	−11.94
	(16.71)	(1.73)	(0.65)	(1.01)	(−0.83)	(1.49)	(−2.11)	(−1.26)
All IPOs	3.80	73.27	117.45	6.78	0.84	315.13	0.25	0.31
Panel B: Medians								
Low FTV	1.45	25.59	66.11	5.00	1.00	177.89	0.25	2.79
Mid FTV	2.78	19.40	56.42	5.00	1.00	179.31	0.24	−6.22
High FTV	5.62	43.98	70.46	5.00	1.00	199.20	0.22	1.26
High−Low FTV	4.16***	18.39***	4.36	0.00	0.00	21.31	−0.03*	−1.52
	(12.99)	(2.46)	(0.56)	(0.59)	(0.83)	(1.24)	(−1.80)	(−0.24)
All IPOs	2.78	26.72	62.88	5.00	1.00	186.18	0.24	−0.91

Table 3: Summary Offer Characteristics of File-to-Value Portfolios

FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. VCR is the lead venture capitalist's (VC) IPO market share in the 3 years prior to the IPO year. The IPO market share is the ratio of the gross proceeds excluding overallotments of the IPOs backed by the lead VC to those of all VCs. UWR is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NASDAQ equals to 1 when the IPO is listed on the Nasdaq, and 0 otherwise. SENT is the Baker and Wurgler (2007) investor sentiment index for the month prior to the IPO. Price Adj is the percentage increase in the offer price from the middle point in the filing range. Initial Return is the percentage increase in the first trading day closing market price from the offer price. Total Return is the percentage increase in the first trading day closing market price from the middle point in the filing range. The numbers in parentheses are t-statistics based on simple t-tests for differences in means, and Wilcoxon-Mann-Whitney tests for differences in medians. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	FTV	VCR	UWR	NASDAQ	SENT	Price Adj	Initial Return	Total Return
Panel A: Means								
Low FTV	1.40	1.37	8.05	0.93	0.36	1.20	23.02	29.45
Mid FTV	2.81	1.38	7.65	0.92	0.25	−1.53	22.55	26.49
High FTV	7.21	1.06	7.98	0.84	0.28	0.71	18.45	24.15
High−Low FTV	5.81***	−0.31**	−0.07	−0.09**	−0.08	−0.49	−4.57	−5.30
	(16.71)	(−2.41)	(−0.35)	(−2.10)	(−1.16)	(−0.14)	(−1.33)	(−0.68)
All IPOs	3.80	1.27	7.90	0.90	0.29	0.12	21.34	26.70
Panel B: Medians								
Low FTV	1.45	1.11	8.00	1.00	0.36	0.00	16.67	11.54
Mid FTV	2.78	1.11	8.00	1.00	0.29	0.00	16.01	8.11
High FTV	5.62	0.89	8.00	1.00	0.31	6.45	13.46	20.00
High−Low FTV	4.16***	−0.21**	0.00	0.00**	−0.04	6.45	−3.21	8.46
	(12.99)	(−2.42)	(0.55)	(2.08)	(−1.18)	(0.15)	(−0.76)	(0.49)
All IPOs	2.78	0.99	8.00	1.00	0.32	0.00	14.85	11.27

Table 4: Regressions of Short-Run Returns on File-to-Value and Control Variables

The dependent variables are: (i) Price Adj is the percentage increase in the offer price from the middle point in the filing range; (ii) Initial Return is the percentage increase in the first trading day closing market price from the offer price; and (iii) Total Return is the percentage increase in the first trading day closing market price from the middle point in the filing range. FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. AGE is the number of years between the IPO date and the company's founding date. TECH equals 1 if the firm is in a high-tech industry, and 0 otherwise. MV is the number of shares outstanding times the close price on the first day of trading, in millions of dollars. BV is the book value of equity in the year of the IPO, in millions of dollars. VCR is the lead venture capitalist's (VC) IPO market share in the 3 years prior to the IPO year. The IPO market share is the ratio of the gross proceeds excluding overallotments of the IPOs backed by the lead VC to those of all VCs. UWR is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NASDAQ equals to 1 when the IPO is listed on the Nasdaq, and 0 otherwise. SENT is the Baker and Wurgler (2007) investor sentiment index for the month prior to the IPO. The numbers in parentheses are heteroscedasticity consistent t-statistics. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	Price Adj	Initial Return	Total Return
Ln(FTV)	-2.88^{*}	-5.17^{***}	-11.32^{***}
	(-1.65)	(-3.15)	(-3.32)
Ln(1+AGE)	1.09	-4.35^{**}	-6.54
	(0.48)	(-2.11)	(-1.23)
TECH	-0.47	5.54^{*}	8.43
	(-0.15)	(1.75)	(1.17)
Ln(MV)	16.12^{***}	12.60^{***}	43.37^{***}
	(7.95)	(5.21)	(8.51)
Ln(BV/MV)	-5.23^{**}	-5.07^{**}	-15.98^{***}
	(-2.59)	(-2.51)	(-2.99)
VCR	-4.34^{***}	-1.85	-9.17^{***}
	(-3.05)	(-1.34)	(-2.97)
UWR	-2.00^{**}	-0.51	-3.57^{*}
	(-2.09)	(-0.61)	(-1.86)
NASDAQ	3.91	2.62	8.66
	(0.85)	(0.68)	(0.86)
SENT	6.35^{*}	3.36	13.88^{**}
	(1.73)	(1.23)	(2.00)
Price Adj		0.38^{***}	
		(6.01)	
Intercept	-74.06^{***}	-40.51^{***}	-178.47^{***}
	(-7.04)	(-3.67)	(-7.95)
Adj. R^2	0.300	0.489	0.431
N	266	266	266

Table 5: Long-Run Market Performance of File-to-Value Portfolios

FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. Raw Buy-and-Hold Return (BHR) is the IPO firm's buy-and-hold return using daily returns, starting the day after the offer and ending 1, 2 and 3 years later. Market-Adjusted Buy-and-Hold Return is the difference between the IPO firm's BHR and the BHR from the CRSP equal-weighted index, starting the day after the offer and ending 1, 2 and 3 years later. Style-Adjusted Buy-and-Hold Return is the difference between the IPO firm's BHR and the BHR from an equal-weighted portfolio matched on size and book-to-market, starting the day after the offer and ending 1, 2 and 3 years later. The numbers in parentheses are t-statistics based on simple t-tests for differences in means, and Wilcoxon-Mann-Whitney tests for differences in medians. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	Raw Buy-and-Hold Return			Market-Adjusted Buy-and-Hold Return			Style-Adjusted Buy-and-Hold Return		
	1-Year	2-Year	3-Year	1-Year	2-Year	3-Year	1-Year	2-Year	3-Year
Panel A: Means									
Low FTV	24.76	114.80	90.82	13.16	85.15	51.09	21.37	101.73	71.46
Mid FTV	23.06	48.48	65.40	11.67	19.10	25.49	18.90	34.21	46.53
High FTV	3.76	22.53	30.30	−9.75	−7.32	−10.70	1.55	8.50	10.10
High−Low FTV	−21.00*	−92.27**	−60.52*	−22.91*	−92.47**	−61.79*	−19.82*	−93.23**	−61.35*
	(−1.72)	(−2.44)	(−1.80)	(−1.92)	(−2.44)	(−1.84)	(−1.69)	(−2.41)	(−1.77)
All IPOs	17.21	61.90	62.19	5.05	32.27	21.97	14.01	48.39	42.90
Panel B: Medians									
Low FTV	−4.92	−0.48	0.00	−15.50	−23.93	−46.51	−3.26	−10.52	−19.33
Mid FTV	−4.38	−16.84	−14.46	−13.72	−39.33	−55.26	−0.39	−13.35	−29.93
High FTV	−16.67	−33.00	−46.43	−29.33	−55.48	−79.84	−15.90	−39.30	−61.64
High−Low FTV	−11.75	−32.52***	−46.43***	−13.83	−31.56**	−33.33***	−12.64	−28.78***	−42.31***
	(−1.25)	(−2.66)	(−2.88)	(−1.38)	(−2.42)	(−3.05)	(−1.30)	(−2.47)	(−3.30)
All IPOs	−9.69	−17.49	−22.97	−21.59	−43.83	−62.71	−8.49	−22.06	−36.52

Table 6: Regressions of Long-Run Risk-Adjusted Returns on File-to-Value and Control Variables

The dependent variable is Alpha, the long-run risk adjusted return using the Fama and French (1993) three-factors as risk controls. Specifically, each IPO's monthly excess returns starting the the first month after the offer, is regressed on the Fama and French factors ($R_m - R_f$, SMB, HML) for a 1, 2 or 3-year period. The risk-adjusted return is the intercept from this regression. FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. AGE is the number of years between the IPO date and the company's founding date. TECH equals 1 if the firm is in a high-tech industry, and 0 otherwise. MV is the number of shares outstanding times the close price on the first day of trading, in millions of dollars. BV is the book value of equity in the year of the IPO, in millions of dollars. VCR is the lead venture capitalist's (VC) IPO market share in the 3 years prior to the IPO year. The IPO market share is the ratio of the gross proceeds excluding overallotments of the IPOs backed by the lead VC to those of all VCs. UWR is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NASDAQ equals to 1 when the IPO is listed on the Nasdaq, and 0 otherwise. SENT is the Baker and Wurgler (2007) investor sentiment index for the month prior to the IPO. DCA is the discretionary current accruals in the year of the IPO, as calculated in Teoh et al. (1998a). The numbers in parentheses are heteroscedasticity consistent t-statistics. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	1-Yr Alpha		2-Yr Alpha		3-Yr Alpha	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Ln(FTV)	-1.55^{**}	-1.68^{***}	-1.23^{***}	-1.37^{***}	-1.10^{***}	-1.00^{**}
	(-2.59)	(-2.66)	(-2.73)	(-2.67)	(-2.78)	(-2.30)
Ln(1+AGE)	-1.46^{*}	-1.44	-1.04^{*}	-1.27^{**}	-0.82^{*}	-1.12^{**}
	(-1.66)	(-1.63)	(-1.90)	(-2.19)	(-1.77)	(-2.23)
TECH	1.16	1.38	0.96	0.96	1.82^{**}	1.92^{**}
	(0.81)	(1.02)	(1.12)	(1.08)	(2.32)	(2.32)
Ln(MV)	0.53	0.26	-0.13	-0.61	-0.05	-0.34
	(0.65)	(0.30)	(-0.25)	(-1.14)	(-0.13)	(-0.73)
Ln(BV/MV)	0.63	0.85	0.24	-0.69	-0.16	-0.52
	(0.71)	(0.86)	(0.50)	(-1.22)	(-0.43)	(-1.00)
VCR	0.24	0.42	0.15	0.00	-0.01	-0.20
	(0.35)	(0.60)	(0.40)	(0.00)	(-0.02)	(-0.56)
UWR	0.47	0.49	0.30	0.43^{*}	0.32^{*}	0.41^{*}
	(1.27)	(1.08)	(1.49)	(1.66)	(1.79)	(1.77)
NASDAQ	-1.51	-0.75	-1.90^{**}	-1.94^{*}	-2.31^{**}	-1.95^{*}
	(-1.02)	(-0.47)	(-1.99)	(-1.71)	(-2.22)	(-1.66)
SENT	2.81^{**}	1.69	0.69	1.09	1.16^{*}	1.85^{**}
	(2.27)	(1.26)	(0.93)	(1.31)	(1.78)	(2.47)
DCA		-0.00		-0.01^{**}		-0.02^{**}
		(-0.17)		(-2.31)		(-2.45)
Intercept	-1.45	-0.50	2.86	4.19	1.22	2.21
	(-0.37)	(-0.12)	(1.19)	(1.64)	(0.57)	(0.96)
Adj. R^2	0.023	0.007	0.019	0.044	0.038	0.076
N	266	217	266	217	266	217

Table 7: Long-Run Operating Performance of File-to-Value Portfolios

FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. Earnings per Share is given by Compustat item 58. Return on Assets is the ratio of Net Income (item 172) to prior year Assets (item 6). Cash Flow Return on Assets is the ratio of Net Cash Flow (item 308) to prior year Assets (item 6). Profit Margin is the ratio of Net Income (item 172) to Sales (item 12). Operating performance is industry-adjusted using the median value in the same 2-digit SIC code and in the same fiscal year, excluding firms that had an IPO or SEO. The numbers in parentheses are t-statistics based on Wilcoxon-Mann-Whitney tests for differences in medians. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	Raw Operating Performance				Industry-Adjusted Operating Performance			
	Year 0	Year 1	Year 2	Year 3	Year 0	Year 1	Year 2	Year 3
Panel A: Earnings per Share ($)								
Low FTV	−0.73	−0.76	−0.67	−0.54	−0.80	−0.61	−0.65	−0.46
Mid FTV	−0.90	−0.67	−0.70	−0.51	−0.88	−0.58	−0.67	−0.39
High FTV	−0.04	−0.05	−0.41	−0.32	−0.10	−0.22	−0.35	−0.23
High−Low FTV	0.69***	0.72**	0.26**	0.21	0.70***	0.39*	0.30**	0.23
	(3.38)	(2.22)	(2.09)	(1.27)	(3.14)	(1.96)	(1.99)	(0.93)
All IPOs	−0.52	−0.49	−0.61	−0.43	−0.55	−0.48	−0.54	−0.37
Panel B: Return on Assets (%)								
Low FTV	−43.27	−23.55	−14.71	−20.47	−39.44	−18.42	−6.85	−8.94
Mid FTV	−51.00	−14.08	−18.49	−11.94	−39.41	−14.60	−13.16	−3.85
High FTV	3.45	−1.18	−7.10	−10.15	0.84	−3.88	−3.75	−6.86
High−Low FTV	46.73***	22.38*	7.61	10.32	40.28***	14.54	3.10	2.09
	(2.91)	(1.73)	(1.18)	(0.71)	(2.82)	(1.47)	(0.60)	(0.41)
All IPOs	−16.45	−12.61	−11.69	−13.89	−16.46	−12.29	−7.35	−7.28
Panel C: Cash Flow Return on Assets (%)								
Low FTV	−35.08	−11.42	−3.05	−3.23	−33.73	−10.24	−3.99	−2.91
Mid FTV	−36.07	−6.90	−4.28	−3.80	−34.52	−11.05	−7.73	−2.78
High FTV	1.28	0.08	2.95	2.95	−2.18	−5.16	−1.00	−0.52
High−Low FTV	36.36***	11.50	6.00	6.18	31.55***	5.08	2.99	2.40
	(2.89)	(1.19)	(0.98)	(0.64)	(2.82)	(0.82)	(0.62)	(0.39)
All IPOs	−13.59	−6.71	−0.10	−0.20	−15.85	−8.80	−3.52	−1.06
Panel D: Profit Margin (%)								
Low FTV	−25.48	−33.01	−22.24	−27.10	−26.04	−26.67	−17.75	−21.00
Mid FTV	−25.20	−9.00	−18.28	−12.54	−28.27	−8.77	−11.11	−5.14
High FTV	−1.11	−1.26	−9.78	−14.73	−1.00	−2.67	−6.83	−5.87
High−Low FTV	24.37**	31.74*	12.46	12.37	25.04**	24.00*	10.92	15.13
	(2.41)	(1.86)	(1.37)	(0.82)	(2.43)	(1.82)	(0.99)	(0.63)
All IPOs	−13.36	−10.53	−16.50	−19.24	−9.61	−9.53	−10.72	−9.02

Table 8: Long-Run Investment Activities of File-to-Value Portfolios

FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. Investment to Assets is the ratio of Research & Development (item 46) plus Capital Expeditures (item 128) to prior year assets (item 6). Long-Term Debt to Assets is the ratio of Long-Term Debt (item 9) to prior year Assets (item 6). Total Debt to Assets is the ratio of Long-Term Debt (item 9) plus Debt in Current Liabilities (item 34) to prior year Assets (item 6). Operating performance is industry-adjusted using the median value in the same 2-digit SIC code and in the same fiscal year, excluding firms that had an IPO or SEO. The numbers in parentheses are t-statistics based on Wilcoxon-Mann-Whitney tests for differences in medians. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	Raw Operating Performance				Industry-Adjusted Operating Performance			
	Year 0	Year 1	Year 2	Year 3	Year 0	Year 1	Year 2	Year 3
Panel A: Investment to Assets (%)								
Low FTV	65.74	27.99	27.07	22.70	51.89	12.46	15.18	8.47
Mid FTV	65.47	34.62	31.54	25.96	50.65	19.18	16.42	12.83
High FTV	54.97	19.66	20.28	20.56	41.65	9.85	6.14	7.88
High−Low FTV	−10.77**	−8.32**	−6.79**	−2.13	−10.24*	−2.61	−9.04**	−0.59
	(−2.00)	(−2.17)	(−2.33)	(−0.49)	(−1.87)	(−1.36)	(−1.97)	(−0.31)
All IPOs	61.16	27.17	26.01	22.50	47.69	13.48	12.24	9.23
Panel B: Long-Term Debt to Assets (%)								
Low FTV	2.96	2.29	1.91	2.91	−0.72	−0.96	−1.00	−0.51
Mid FTV	3.42	0.85	0.29	0.34	−0.81	−1.61	−1.71	−1.71
High FTV	0.83	0.46	0.18	0.00	−1.48	−1.71	−1.66	−1.68
High−Low FTV	−2.13	−1.83	−1.73*	−2.91**	−0.76	−0.75*	−0.66**	−1.17*
	(−1.02)	(−1.04)	(−1.70)	(−2.33)	(−1.12)	(−1.82)	(−2.16)	(−1.96)
All IPOs	2.33	1.00	0.59	0.50	−0.95	−1.61	−1.57	−1.10
Panel C: Total Debt to Assets (%)								
Low FTV	6.52	5.09	5.38	7.52	−5.80	−7.09	−6.92	−4.86
Mid FTV	7.81	2.91	2.19	3.29	−6.04	−8.50	−8.62	−8.92
High FTV	5.47	2.53	0.63	0.40	−6.92	−9.47	−9.98	−8.36
High−Low FTV	−1.04	−2.56	−4.76*	−7.12**	−1.13	−2.38	−3.07**	−3.50*
	(−0.45)	(−0.72)	(−1.67)	(−1.98)	(−1.06)	(−1.09)	(−2.19)	(−1.89)
All IPOs	6.51	3.41	2.29	3.87	−6.08	−8.56	−9.09	−6.18

Table 9: Regressions of File-to-Value on CEO Characteristics

The dependent variable is FTV, the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. CEO AGE is the Chief Executive Officer's age at the time of the IPO. CEO EDUCATION equals 0 if the CEO has no degree, 1 if the CEO has a bachelor's degree, 2 if the CEO has a master's degree, and 3 if the CEO has a doctorate. The numbers in parentheses are heteroscedasticity consistent t-statistics. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	Model 1	Model 2	Model 3
Ln(CEO AGE)	0.32		0.38
	(1.05)		(1.23)
CEO EDUCATION		-0.09^{**}	-0.10^{**}
		(-2.15)	(-2.37)
Intercept	-0.20	1.17^{***}	-0.25
	(-0.17)	(14.63)	(-0.22)
Adj. R^2	0.001	0.010	0.015
N	259	269	259

Table 10: Regressions of Long-Run Risk-Adjusted Returns on Predicted File-to-Value and Control Variables

The dependent variable is Alpha, the long-run risk adjusted return using the Fama and French (1993) three-factors as risk controls. Specifically, each IPO's monthly excess returns starting the the first month after the offer, is regressed on the Fama and French factors ($R_m - R_f$, SMB, HML) for a 1, 2 or 3-year period. The risk-adjusted return is the intercept from this regression. PFTV is the predicted value from the regession of Ln(FTV) on CEO AGE and CEO EDUCATION, where FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. AGE is the number of years between the IPO date and the company's founding date. TECH equals 1 if the firm is in a high-tech industry, and 0 otherwise. MV is the number of shares outstanding times the close price on the first day of trading, in millions of dollars. BV is the book value of equity in the year of the IPO, in millions of dollars. VCR is the lead venture capitalist's (VC) IPO market share in the 3 years prior to the IPO year. The IPO market share is the ratio of the gross proceeds excluding overallotments of the IPOs backed by the lead VC to those of all VCs. UWR is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NASDAQ equals to 1 when the IPO is listed on the Nasdaq, and 0 otherwise. SENT is the Baker and Wurgler (2007) investor sentiment index for the month prior to the IPO. DCA is the discretionary current accruals in the year of the IPO, as calculated in Teoh et al. (1998a). The numbers in parentheses are heteroscedasticity consistent t-statistics. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	1-Yr Alpha		2-Yr Alpha		3-Yr Alpha	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
PFTV	0.31	−2.84	−8.04**	−8.80**	−8.84***	−9.55***
	(0.06)	(−0.48)	(−2.43)	(−2.38)	(−2.93)	(−2.82)
Ln(1+AGE)	−1.64	−1.70	−1.06*	−1.23**	−0.79	−1.08**
	(−1.59)	(−1.62)	(−1.84)	(−2.02)	(−1.58)	(−2.02)
TECH	−0.09	−0.09	−0.30	−0.57	0.49	0.20
	(−0.04)	(−0.05)	(−0.28)	(−0.54)	(0.52)	(0.24)
Ln(MV)	−0.33	−0.73	−0.82	−1.16**	−0.22	−0.28
	(−0.39)	(−0.81)	(−1.63)	(−2.19)	(−0.52)	(−0.60)
Ln(BV/MV)	1.72**	1.19	0.15	−0.72	−0.46	−0.61
	(2.05)	(1.17)	(0.27)	(−1.31)	(−0.99)	(−1.18)
VCR	−0.10	0.31	0.10	−0.01	−0.02	−0.12
	(−0.13)	(0.41)	(0.24)	(−0.02)	(−0.06)	(−0.31)
UWR	0.68*	0.63	0.55**	0.63**	0.43**	0.39
	(1.67)	(1.15)	(2.33)	(2.00)	(2.10)	(1.43)
NASDAQ	−0.14	0.15	−2.19*	−2.23*	−1.96*	−1.68
	(−0.08)	(0.08)	(−1.91)	(−1.69)	(−1.75)	(−1.35)
SENT	3.16**	2.31	0.78	1.04	1.45**	2.02**
	(2.38)	(1.63)	(1.04)	(1.23)	(2.19)	(2.54)
DCA		0.00		−0.01		−0.01
		(0.44)		(−1.35)		(−1.64)
Intercept	2.07	6.82	13.11***	14.90***	9.81**	12.06***
	(0.30)	(0.92)	(3.03)	(3.02)	(2.53)	(2.75)
Adj. R^2	0.024	-0.005	0.036	0.050	0.051	0.088
N	203	169	203	169	203	169

Table 11: Regressions of File-to-Value on Pre-File Venture Capital, Market and Industry Characteristics

The dependent variable is FTV, the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. DELTA is the number of days between the venture capital valuation date and the filing date. RVAL is the total amount of venture capital financing received by the IPO firm between the venture capital valuation date and the filing date. MBHR is the BHR from the CRSP equal-weighted index between the venture capital valuation date and the filing date. MVOL is the volatility from the CRSP equal-weighted index between the venture capital valuation date and the filing date. IBHR is the BHR from the IPO firm's industry portfolio between the venture capital valuation date and the filing date. IVOL is the volatility from the IPO firm's industry portfolio between the venture capital valuation date and the filing date. The numbers in parentheses are heteroscedasticity consistent t-statistics. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	Model 1	Model 2	Model 3	Model 4
Ln(DELTA)	0.15***			0.17***
	(5.19)			(3.85)
Ln(RVAL)	−0.01			−0.01
	(−0.51)			(−0.58)
MBHR		0.00**		0.00
		(2.17)		(0.98)
MVOL		0.20		0.22
		(1.03)		(0.88)
IBHR			0.00	−0.00*
			(0.60)	(−1.76)
IVOL			−0.03	−0.13
			(−0.22)	(−0.78)
Intercept	0.23	0.82***	1.06***	0.16
	(1.26)	(5.92)	(6.63)	(0.71)
Adj. R^2	0.049	0.011	−0.004	0.046
N	340	337	336	336

Table 12: Regressions of Long-Run Risk-Adjusted Returns on Residual File-to-Value and Control Variables

The dependent variable is Alpha, the long-run risk adjusted return using the Fama and French (1993) three-factors as risk controls. Specifically, each IPO's monthly excess returns starting the the first month after the offer, is regressed on the Fama and French factors ($R_m - R_f$, SMB, HML) for a 1, 2 or 3-year period. The risk-adjusted return is the intercept from this regression. RFTV is the residual from the regession of Ln(FTV) on venture capital, market and industry characteristics, where FTV is the ratio of the middle point of the filing range multiplied by the number of shares outstanding before the offer plus the number of shares filed, to the venture capital firm's valuation obtained within two years before the filing date. AGE is the number of years between the IPO date and the company's founding date. TECH equals 1 if the firm is in a high-tech industry, and 0 otherwise. MV is the number of shares outstanding times the close price on the first day of trading, in millions of dollars. BV is the book value of equity in the year of the IPO, in millions of dollars. VCR is the lead venture capitalist's (VC) IPO market share in the 3 years prior to the IPO year. The IPO market share is the ratio of the gross proceeds excluding overallotments of the IPOs backed by the lead VC to those of all VCs. UWR is the average Carter and Manaster (1990) underwriter rating of all lead underwriters in the IPO. NASDAQ equals to 1 when the IPO is listed on the Nasdaq, and 0 otherwise. SENT is the Baker and Wurgler (2007) investor sentiment index for the month prior to the IPO. DCA is the discretionary current accruals in the year of the IPO, as calculated in Teoh et al. (1998a). The numbers in parentheses are heteroscedasticity consistent t-statistics. ***, ** or * signify that the test statistic is significant at the 1, 5 or 10% level, respectively. The sample includes IPOs from 1987 to 2005, excluding the bubble period (1999 and 2000).

	1-Yr Alpha		2-Yr Alpha		3-Yr Alpha	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
RFTV	-1.82^{***}	-2.07^{***}	-1.29^{***}	-1.46^{***}	-1.00^{**}	-0.88^{*}
	(-2.87)	(-2.99)	(-2.73)	(-2.67)	(-2.47)	(-1.91)
Ln(1+AGE)	-1.51^{*}	-1.48^{*}	-1.13^{**}	-1.36^{**}	-0.90^{**}	-1.21^{**}
	(-1.70)	(-1.65)	(-2.04)	(-2.31)	(-1.99)	(-2.42)
TECH	1.36	1.50	1.07	1.12	1.86^{**}	2.01^{**}
	(0.95)	(1.12)	(1.25)	(1.27)	(2.36)	(2.45)
Ln(MV)	-1.40	-0.66	-1.68^{*}	-1.88	-1.94^{*}	-1.69
	(-0.92)	(-0.39)	(-1.70)	(-1.58)	(-1.85)	(-1.38)
Ln(BV/MV)	0.47	0.52	0.31	0.47^{*}	0.35^{*}	0.46^{*}
	(1.28)	(1.15)	(1.55)	(1.79)	(1.92)	(1.96)
VCR	0.24	0.42	0.19	0.05	0.09	-0.07
	(0.35)	(0.60)	(0.51)	(0.13)	(0.29)	(-0.20)
UWR	2.82^{**}	1.65	0.75	1.21	1.24^{*}	1.98^{***}
	(2.26)	(1.21)	(1.01)	(1.44)	(1.89)	(2.61)
NASDAQ	0.59	0.30	-0.15	-0.64	-0.19	-0.51
	(0.71)	(0.35)	(-0.31)	(-1.17)	(-0.46)	(-1.09)
SENT	0.62	0.82	0.23	-0.72	-0.17	-0.54
	(0.70)	(0.83)	(0.48)	(-1.26)	(-0.45)	(-1.02)
DCA		-0.00		-0.01^{**}		-0.01^{**}
		(-0.27)		(-2.30)		(-2.19)
Intercept	-3.60	-2.92	1.40	2.47	0.25	1.32
	(-0.91)	(-0.70)	(0.56)	(0.96)	(0.11)	(0.57)
Adj. R^2	0.026	0.014	0.021	0.046	0.033	0.070
N	262	213	262	213	262	213