Investor Preferences, Mutual Fund Flows, and the Timing of IPOs

by

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Abstract

I examine the role of investor preference on firms' decision regarding initial public offerings. It is crucial for first time issuers to understand what market desires in order to successfully complete the IPO process. In this study, I look at investor preference from two aspects: investor sentiment and investor risk preference. Using monthly open-end mutual fund flows as a proxy for investor sentiment, I find that IPO volume, withdrawals, underpricing, and price revision are all related to my fund flows proxy. Issuers' filing decisions are also affected by the predicted sentiment for the expected IPO month. I also hypothesize that a going public firm will try to issue its IPO when investor risk preference is favorable to the firm's own risk characteristics. Using the difference between flows into equity mutual funds and flows into bond mutual funds as a proxy for investor risk preference, I find that an issuing firm attempts to issue shares when investors risk preference is favorable to the firm. Empirical results suggest that issuers incorporate not only general investor sentiment but also investor risk preference into their issuing and filing decisions.

Introduction

In this study, I empirically examine the role of investor preference measured by mutual fund flows in the entire initial public offering (IPO) process. There are two aspects of investor preferences: general sentiment and risk preference. Investor sentiment indicates how optimistic investors are about the security markets at any given point.[2] Investor risk preference may change from time to time that leads to desires for securities with different risk features. They could therefore be important considerations for firms which are planning to go public. The entire IPO process includes issuers' filing behavior, price revisions, withdrawal activities, issuance decisions, and eventual underpricing. Sentiment might explain hot and cold IPO markets featuring high and low number of equity issues, proceeds from IPO activities, and IPO underpricing.[3] For instance, if investor sentiment is particularly high, then markets will have a higher demand for equity, making it a favorable time to issue new equity.

Hot IPO markets and high first-day returns have long been documented in financial academic research.[4] Lowry and Schwert (2002) show that more companies tend to go public following periods of high initial returns. Pastor and Veronesi (2005) develop a model of optimal timing in which IPO volume fluctuates due to time variation in market conditions. Lowry (2003) further examines the determinants of IPO volume and suggests that capital demands of private firms, adverse-selection cost of issuing equity, and the level of investor optimism can explain these fluctuations. While IPO volumes and underpricing have been studied in the literature, Ljungqvist, Nanda, and Singh (2006) provide a theoretical model to link underpricing, hot IPO markets, and long-run underperformance to investor sentiment.

[2] For more discussion on investor sentiment, see Barberis, Shleifer, and Vishny (1998), DeLong, Shleifer, Summers, and Waldmann (1990a), and DeLong, Shleifer, Summers, and Waldmann (1990b).
[3] See Ritter (1984) and Helwege and Liang (2004) for a discussion of hot and cold IPO markets.
[4] See Ibbotson and Jaffe (1975), Ibottson, Sindelar, and Ritter (1988, 1994).

A recent *Wall Street Journal* article suggests that large Wall Street firms have good reason to prefer the traditional model known as "book building" when advising a private firm on the going public decision. Using book building "entails gauging the interest of hedge funds and mutual funds in an offering" (July 6, 2005, C1). Book building is selected by the majority of issuers and underwriters to better evaluate investor preference and promote issuance. In this paper, I use monthly open-end mutual fund flows to proxy for investor sentiment. Mutual funds have grown in popularity over the past few decades. According to the Investment Company Institute, registered investment companies manage the single largest component of household assets. The popularity of funds among individual investors makes it a logical place to look for investor preference. Equity fund managers with net inflows will be more inclined to invest in IPOs since they need to invest this cash somewhere in the equity market. Thus, I regard higher net inflows into equity mutual funds as indicative of investor sentiment favorable to equity issuance.

The second aspect of this study examines the relationship between IPO risk characteristics and investor risk preference at the time. Given the unique characteristics of fund flows, investor risk preferences can be inferred based on fund flows into different risk-classes of securities. This study adds to the IPO literature by linking investor risk preference to the risk characteristics of IPOs. In addition to investor sentiment changing over time, investors' attitudes toward risk may also change. While related to sentiment, investor risk preferences might play an additional role in the IPO market. Even in a cold market, when there are fewer IPOs, if investors are relatively more risk averse, then market conditions might be more favorable for safer companies to go public. In this study, I intend to capture the separate roles that investor sentiment and investor

risk preference each play in influencing firms' choices related to the IPO process such as timing and filing decisions.

As a first step, I examine whether sentiment, measured by equity fund flows, impacts issuing activities. Several studies suggest that firms try to time the market when issuing new equity (Schultz, 2003). Lee, Shleifer, and Thaler (1991) propose using the discount on closed-end funds to proxy for investor sentiment. They document a relation between closed-end fund discounts and annual IPO volume that suggests investor sentiment is important in determining when firms go public.

Previous research has examined cycles in the underpricing and timing of IPOs.[5] If the demand for new securities is low, then firms that choose to go public may be unable to raise enough capital and will have to withdraw their offerings. If, on the other hand, investor sentiment is high, then there can be windows of opportunity in which firms offer new shares to the public. Successfully timing of these windows enables issuers to raise sufficient capital in order to support their future projects. Baker and Wurgler (2002) suggest that capital structure is the cumulative outcome of past attempts to time the equity market. Investor sentiment could be an important consideration for firms that are planning to go public

Using fund flows to measure sentiment and investor risk preferences provides several advantages. Mutual fund flow data measures the actual dollar amounts that are being directed into security markets. As large portions of IPO shares are subscribed by institutional investors (Hanley and Wilhelm, 1995; Aggarwal et al., 2002; Ljungqvist and Wilhelm, 2002) that include mutual fund companies, fund flows provide direct indications of how optimistic IPO participants feel about the security markets at any given point. Firms attempt to time their IPOs to exploit

[5] See, for example, Ritter (1984) and Helwege and Liang (2004).

favorable market sentiment.[6] Consistent with this argument, we find that the number of IPOs is positively related to mutual fund flows in the several months leading up to the IPO. On the other hand, the number of withdrawn IPOs is found to be negatively related to concurrent equity fund flows.

To further understand how sentiment becomes incorporated into the IPO process, I examine issuers' filing behavior. Lowry and Schwert (2002) find that firms tend to file IPOs following periods of high initial returns because high returns reflect positive information learned during the registration period. I expect issuers to rationally file with the *Securities Exchange Commission* (SEC) only when they believe that the expected future sentiment will remain high during the expected IPO month. Consistent with this hypothesis, I find a positive relation between the number of IPO filings and the predicted investor sentiment during the expected IPO issuance month.

Ljungqvist, Nanda, and Singh (2006) and Derrien (2005) use investor sentiment to explain the partial adjustment phenomenon and the degree of underpricing. Ljungqvist, Nanda, and Singh argue that underpricing occur as fair compensation to the regulars for carrying IPO stock in inventory because sentiment demand may disappear prematurely. My study follows the same stream of thought by examining the link between offer price revision and underpricing to the fund flow proxy of investor sentiment. I find that underpricing is more severe in months in which there are higher mutual fund flows. Moreover, the final offer price revision is positively affected by the sentiment at the time of setting the price.

Previous studies do not consider the impact of investor risk preferences on the IPO process. Figure 2 illustrates how a change in investor risk preferences pivots the security market line, resulting in varying changes in valuation for firms with different levels of risk. For example,

[6] See Figure 1 for more discussions.

higher risk firms may face lower valuation discounts in periods of low risk aversion. There is less of a chance of undervaluation for high risk IPOs in a market when investors are less risk averse. To exploit the favorable condition, high risk IPOs come to the capital market at a time when investor risk aversion is low. Therefore, a link between firm characteristics and investor risk preferences is expected, and IPO volume and proceeds should also be related to investor risk preferences.

Using the difference between flows into equity mutual funds and flows into bond mutual funds as a proxy for investor risk preference, I examine whether issuers time their offering in periods where investor sentiment is conducive to issues in their risk category. I find that issuers bring the companies public at times when their risk characteristics are favored by investors. Thus, issuers' time the market keeping in mind both general investor sentiment and investor risk preferences.

This paper adds to the existing literature on IPOs in the following ways. First, I use monthly open-end mutual fund flows as a measure of investor sentiment. Fund flows measure the actual dollar amount being directed into the capital market and give issuers sense on how much investors demand for equity investments. Second, I relate these flows to different aspects of the IPO process like the incidence of hot and cold IPO cycles, filing behavior, price revision, and eventual underpricing.[7] Third, the unique characteristics of fund flows allow me to make inferences on investor risk preferences at any time and to relate these preferences to IPO firms' issuing and filing decisions. Issuers may attempt to take advantage of a favorable market by matching their firm risk characteristics with investor risk preference at the time.

[7] I also investigate whether specific sector sentiment exists in the market. Analyzing sector flows to the utility, healthcare, technology, finance, and natural resource industries, I find that for every $100 million increase in the prior month's sector fund flows, the current sector IPO proceeds increase by $47 million. Further, the positive impact of current sentiment on underpricing and offer price setting also holds at the sector level.

This paper is organized as follows. Section I discusses the IPO process and related literature. Section II describes the IPO data, investor sentiment, and risk preferences proxies measured by fund flows. Section III examines the time-series relations among fund flows and IPO volume, firms filing behavior, underpricing, and price revision. Section IV addresses the role of investor risk preferences on firms issuing and filing activities. Finally, Section V summarizes and concludes the paper.

I. Related Literature and Hypotheses Development

A. IPO Process

The IPO process begins with a team meeting that usually takes place six to eight weeks before a company officially registers with the *Securities and Exchange Commission* (SEC).[8] An IPO team consists of the lead investment bank, an accountant, and a law firm. During this time period, the IPO team develops the company's prospectus, which includes company financial data for the past five years, information on the management team, and a description of target markets, competitors, and growth strategy.

Once the preliminary prospectus is filed with the SEC, the lead underwriter assembles a syndicate of other investment banks that will help to sell the deal. Each bank in the syndicate gathers information from clients to gauge initial demand. The next step in the IPO process is the road show, where the company management team meets prospective investors and presents their business plan.

Once the road show ends and the final prospectus is declared effective by the SEC, the company management meets with its investment bank to decide the final offering price. If the deal is especially hot, the offering price may fall above the mid filing price or close to the high

[8] IPO process information is gathered from http://www.sharebuilder.com/about_us/articles/ipo/article2.htm

filing price. Once the final offering price has been agreed upon, an IPO will start trading the next day in the market.

In total, the IPO process can take from four to twelve months from the first "all-hands" meeting to the closing date. The process involves two separate phases[9]: preparation for registration, which is within management's control and can take from two months to a year, and registration with the security authority, which depends on the workload of the SEC and can take a few weeks to several months.

The firm going public makes three timing decisions. The first is the decision to go public and start assembling an IPO team; this timing decision is rarely available to the general public. The second decision is when to file registration with the SEC authority. After or during its prospectus is reviewed by the SEC, the firm going public decides whether to issue or to withdraw from the market based on market conditions and the initial demand from prospective investors. The filing date and issue date of each IPO has an official record with the government agency. This study examines the factors that affect firms' filing, withdrawing, and issuing decisions based on these official records.

B. Hypothesis Development

This study examines the relations between investor sentiment, measured by equity fund flows, and activities in the IPO process. Warther (1995) and Cha and Lee (2001) employ monthly equity mutual fund flows as a proxy for aggregate demand; Warther suggests that mutual fund flows are a logical place to look for indicators of unsophisticated investor sentiment. Brown et al. (2005) find that daily fund flows can be used as a proxy for investor sentiment and

[9] Information gathered from "Going public: everything you need to know to take your company public, including internet direct public offerings" by James B. Arkebauer with Ron Schultz, 1998 and from "The Ernst & Young Guide to Taking Your Company Public", 1995.

construct a simple sentiment factor consisting of equity fund flows and metal fund flows. This robustness check provides a similar magnitude of explanatory power for the sentiment premium. Frazzini and Lamont (2005) look into the ownership of mutual fund in each stock to infer individual investor sentiment. Building on these studies, this paper uses monthly U.S. open-end equity fund flows as proxies for investor sentiment and uses the difference between equity and bond fund flows as proxies for investor risk preferences. The unique fund flows proxy allows us to observe investor demand for stocks and investor risk tolerance based on flows into funds with different risk objectives.

Underpricing of IPOs has long been documented in the IPO literature. Ritter (1984) analyzes the hot issue market of early 1980s, during which the average first-day return was 48.4%. Each hot issue market period was followed by a large and prolonged increase in IPO volume. Using a large sample of IPOs that went public between 1975 and 2000, Helwege and Liang (2004) find that firms with lower profits and lower capital expenditure intensity, but not necessarily greater growth opportunities, can receive more favorable responses from investors when going public in a hot market. Their results are consistent with the characterization of hot markets as periods when investors are more willing to purchase IPO stocks, rather than periods in which private firms experience a greater need for financing or change in ownership structure. In other words, shifts in the demand for IPOs are an important determinant of IPO cycles.

Ljungqvist, Nanda, and Singh (2006) link an IPO company's optimal response to the presence of sentiment investors and short sale constraints. Issuers allocate stocks to regular institutional investors for subsequent resale to sentiment investors. A hot market may end prematurely; therefore, underpricing occurs to compensate regulars to hold IPO inventories. Because offer size increases as a result of high investor sentiment, regular investors must be

compensated for taking on the risk of carrying the inventory. This model generates several empirical implications, including IPO volumes, proceeds, and long-run underperformance. As the optimism of investors' increases, more companies have an incentive to go public, resulting in an increase of IPO proceeds and more underpricing in a hot market.

Lowry (2003) provides a more detailed examination of IPO volume and timing. Lowry explains the fluctuation of IPO volume by evaluating the firm's demand for capital, investor sentiment, and information asymmetry. She finds that variation in the level of investor optimism causes the costs of issuing equity to differ and IPO volume to fluctuate over time. Investors are overly optimistic during some periods and are willing to pay more for firms than they are worth. Lowry adopts the method from Lee, Shleifer and Thaler (1991) and uses discounts on closed-end funds as a proxy for investor sentiment. Investor sentiment is found to be an important determinant of IPO volume.

Firms going public will try to issue IPOs when their securities are desirable. Figure 1 shows that when investor sentiment is high, assets are priced at a higher level compared to their fundamental value, regardless of firm characteristics. For firms that attempt to raise maximum proceeds from the offerings, coming to the market when investors are enthusiastic about stock market is crucial. When investor sentiment is high, issuer are able to sell equities to the public at a higher price, resulting in a hot market for IPOs. Using equity fund flows to measure investor demand for stocks; I expect that more firms come to the stock market to raise capital when sentiment is high. In other words, I expect to see a positive relationship between sentiment and the number of offerings. By the same token, more withdraws should occur when sentiment measured by equity fund flows is low resulting in a negative relationship between sentiment and withdrawn activities.

From Lowry and Schwert (2002), issuers file registration with the SEC and become public following a period of large IPO underpricing. Their results suggest that issuers register with the SEC based on previous positive news and the expectation that this trends will continue until firms go public. Investor sentiment can affect a firm's equity offering process from many aspects, starting from the filing decision to the offer price revision before the issuing date. To directly test firms' timing decision, I look at firms' filing behavior and relate their filing decisions to the level of predicted sentiment. Because the equity offering process usually takes two to three months, examining filing decisions reveals implications of the firms' action to engage in the issuance. This leads to the first hypothesis:

Hypothesis 1.a: *The likelihood of firms to issue an IPO increases with the level of investor sentiment, as measured by open-end mutual fund flows.*

Hypothesis 1.b: *The number of withdrawn IPOs is negatively related to investor sentiment, as measured by open-end mutual fund flows.*

Hypothesis 1.c: *A firm's decision to file with the SEC is positively associated with the expected future sentiment.*

Researchers have documented that, on average, IPO shares are underpriced relative to the first day closing price (Ibbotson, 1975). Most of the underpricing theories are based on asymmetric information between investors and issuers. These models can be categorized into two groups that the issuer is more informed than investors or that some investors are more informed than the issuers. Welch (1989), Allen and Faulhauber (1989), and Booth and Smith

(1986) fall into the first category, while Rock (1986), Beaty and Ritter (1986), and Benveniste and Spindt (1989) represent the second.

Benveniste and Spindt (1989) suggest that issuers underprice the issues in order to induce regular participants to reveal indication of interest during the book building process. Their model predicts a partial adjustment of the offer price with respect to private information in order to compensate regulars for revealing positive information. Underwriters only partially incorporate positive information learned during the registration period into the final price. Benveniste and Spindt's model provides an explanation for IPO underpricing and the allocation pattern to repeated IPO participants.

In Derrien's (2005) framework, the IPO offer price chosen by the underwriter depends on both the intrinsic value of the company and noise trader sentiment. Because the underwriter is committed to costly aftermarket price support, the underwriter sets an IPO price that is between the company's intrinsic value and the price that noise traders are ready to pay. Therefore, the information about noise trader sentiment is partially incorporated into IPO prices; the level of initial return is also positively related to noise trader sentiment.

Cornelli, Goldreich, and Ljungqvist (2006) use the European pre-IPO (or "grey") market to proxy for investor sentiment with respect to individual stocks instead of considering sentiment as a market-wide phenomenon. When small investors are over-optimistic, they are willing to pay a price above fundamental value, therefore observing a high aftermarket price. When small investors are pessimistic, they are priced out of the market resulting in no effect on the aftermarket price. There exists an asymmetric relation between grey market and aftermarket prices. Thus, small investors can cause the post-IPO price to be above the fundamental value but not below it. This is similar to the work of Miller (1977), who finds that the price of financial

securities is subjective to diverging opinions among investors and short-sale constraints that are driven by optimistic investors.

Since the final price is usually set a day before the issuing date, the offer price, relative to its initial filing price range, should be positively related to investors' valuation for the security. Underwriters or issuers incorporate higher valuation from investors into the pricing process but must reward investors for revealing positive information based on Benveniste and Spindt's model. When investors place a higher valuation for a security and reveal such information to underwriters or issuers, investors receive compensation in the form of underpricing. The more the positive valuation that investors reveal to the underwriters, the higher the degree of underpricing needed to compensate investors. In addition, aftermarket investor valuation drives the first day trading price of an IPO and leads to a higher first day closing price. Thus, the following hypothesis is made:

Hypothesis 2.a: *The level of IPO underpricing increases with the level of investor sentiment as measured by fund flows.*

Hypothesis 2.b: *There is a positive association between the final offer price relative to the initial pricing range and the degree of investor sentiment as measured by fund flows.*

Investors with different levels of risk aversion invest in funds with different objectives. Therefore, examining flows to different mutual funds objectives reveals the level of risk-taking by investors. Shy and Stenbacka (2003) suggest that with low competition in the mutual fund industry, the perfect equilibrium portfolio exhibits maximal risk differentiation; with intensified competition, intermediate funds attracting investors with intermediate attitudes towards risk

select to diversify their portfolios. Dwyer, Gilkeson, and List (2002) specifically test investors' risk preference levels by looking at what types of funds investors hold. Money market and municipal money market funds are considered the least risky types of funds. Stock funds are the most risky and are held by investors with the highest risk tolerance.

Warther (1995) concludes that mutual fund investors trade securities based on information that simultaneously affects security returns. Kadiyala (2004) examines the relationship between fund flows and asset returns by classifying funds into five categories based on the riskiness of securities held in the funds. She finds that flows into high-risk stock funds are positively related to the measure of stock returns and corporate bond returns. However, this cross-asset relationship is absent for the low-risk stock category; that is, flows into low-risk stock funds are unrelated to stock market returns. These results collectively indicate that price pressure created by funds is only a partial explanation for the relationship between flows and market returns. She studies the impact of three sources of predictability that affect the flow-return relationship to find time varying risk aversion has the highest explanatory power for flows into different objective funds.

Because of the unique characteristics of fund flows, investors' attitudes toward risk can be measured by evaluating the different risk objectives of the mutual funds in which they invest. In a higher risk tolerance market, investors prefer risky investments and investors require a lower risk premium per unit of risk to which they are exposed. As in Figure two, a riskier company will be priced at a higher level in a low risk aversion market compared to a less risky firm. If companies going public intend to time the market by issuing securities at a higher value, they will try to match the timing of their issues to a period of higher demand for their securities. Even if IPOs are usually allocated to institutional investors,[10] the demands for IPOs from institutional

[10] Using a small U.S. IPO sample, Ljungqvist and Wilhelm (2002) show an average of 66.3% shares are allocated to institutional investors. Evidence from Hanley and Wilhelm (1995) and Aggarwal et al. (2002) suggest similar results.

investors will still reflect demand from the general public. If the demand for risky stocks is high, institutional investors will want to have more shares of a risky IPO. Figure 2 illustrates a case where risky IPOs experience a higher valuation when investors become less risk averse. The issuers are expected to rationally file the registration with the SEC only when they believe that investor risk preference will be favorable around the expected issuance dates. Therefore, the number of high risk firms undergoing an IPO decreases with the level of risk aversion of the investors. Moreover, a firm's decision to file with the SEC is associated with the expected future investor risk preferences. This leads to the third hypothesis:

Hypothesis 3.a: *The number of high risk firms undergoing an IPO decreases with the level of risk aversion of the investors.*

Hypothesis 3.b: *A firm's decision to file with the SEC is associated with the expected future investor risk preferences.*

This study intends to shed some light on the relationship between investor sentiment and firm's going public process. The above hypotheses associate investor sentiment measured by equity fund flows with firms' filing, withdrawing, and issuing decisions. Sentiment's impact on price revision and long time IPO puzzle, underpricing, are also examined here. In addition, this study proposes to examine firms' filing and issuing decisions from risk preference aspects. Associating a firm's risk characteristics with investor risk preferences in the market allows us to gain more understanding about features of the IPO market.

II. Sample Selection and Data Description

A. Sample Selection

The sample consists of firms completing an IPO between January 1986 and December 2004. This information was obtained from the Securities Data Corporation (SDC) database. Excluding unit offerings, closed-end funds, REITs, ADRs, penny stocks (IPOs with offer prices below five dollars), and non-firm committed issuing technique issuance, the final sample consists of 5,631 IPOs.

To examine the impact of investor sentiment on the overall IPO process, equity fund flows from the Investment Company Institute (ICI) are used as proxies for the market's desire for equities. Monthly aggregate fund flow data from the ICI includes virtually all U.S. open-end mutual funds. ICI classifies funds into 21 categories based on underlying securities. Among the 21 categories, ICI defines larger fund categories as stock funds, bond funds, money market funds, and hybrid funds. Monthly differences between aggregate equity and bond fund flows are used to proxy for investor risk preferences between conservative and risky investments. Mutual fund net flow is obtained by deducting the redemption and the net result of transfers between funds from new sales of each fund category.[11]

To classify an IPO as a risky issue, the IPO aftermarket return standard deviation is compared to the average return standard deviation of stocks listed on NASDAQ, NYSE, and AMEX. Aftermarket standard deviation of stock returns is calculated using the first 30 return observations, starting from the third trading day. The stock return data comes from Wharton Research Data Service CRSP daily stock database. The market value of each security is also obtained from CRSP daily stock and book value data from COMPUSTAT North America. The underwriter prestige ranking comes from Carter, Dark, and Singh (1998) and was updated by

[11] See www.ici.org for detailed discussion on aggregate month fund flows.

Ritter and Loughran in 2004.[12] Carter, Dark, and Singh's (1998) rankings range from one being least reputable to nine being the most reputable underwriter, whereas Ritter and Loughran's rankings range from 1.1 to 9.1.

B. Data Description

Table I provides the descriptive statistics for IPO volume, proceeds, first-day return, offer prices, and days in registration. Proceeds are adjusted by the consumer price index listed in the U.S. Department of Labor Bureau of Labor Statistics.[13] Proceeds from an IPO average $39.83 million during the period 1986 to 2004. The average proceeds are smaller earlier in the sample period and reach peak during 2001 in our sample. For instance, average proceeds in 1986 are $26.87 million and 145.90 million dollars in 2001 based on 1983 consumer price index.

The average first-day return during the full sample period is 20.49%. The average first day returns are especially high for 1999 (72.71%) and 2000 (56.82%), during the internet bubble period. The average offer price is $12.21 and ranges from $9.96 in 1988 to $15.31 in 2001. The last column in Table I provides information on the average registration time in days. The number of average days between an IPO company filing with the SEC and the SEC declaring the IPO effective is 78.63 days, ranging from 36.25 days in 1986 to 155.68 days in 2001. However, in most years, an IPO spent an average of two to three months in the registration period.

A firm's decision to file with the SEC is based on the completeness of the prospectus along with the perception that market demand will continue to be high for the next couple of months. During the registration period, the issuing company receives information on whether it is a hot IPO from the demand gauged from prospective investors. If bad news occurs during the

[12] See Jay Ritter's website at http://bear.cba.ufl.edu/ritter/ipodata.htm
[13] www.bls.gov/cpi

registration period or the demand from prospective investor is weak, the issuer may withdraw its IPO registration from the SEC to avoid a cold IPO. If the firm going public perceives strong demand for the issue, then it waits for SEC approval and starts trading once the issue is declared effective.

Table II presents descriptive statistics on the sentiment and investor risk preference proxies. Monthly equity fund flows are used as a proxy for investor sentiment; monthly flows, flows deflated by CPI (base year 1983), and flows adjusted by total market capital are presented here. The higher the equity fund flows, the higher the investor sentiment about the security markets. The average monthly equity flows during the sample period is $5.35 billion in real 1983 dollars. Monthly equity fund flows range from $1.28 billion outflows in 2002 to $14.43 billion inflows in 2000. The proxy for investor risk preferences is the difference between equity fund flows and bond fund flows, adjusted for CPI or total market capital depending on the specification. The larger the difference between equity and bond fund flows, the less risk-averse investors are during the period. The average difference between these two funds categories is $3.74 billion dollars during the sample period.

The investor sentiment proxy is associated and compared with the Yale Confidence Index. Yale Confidence Index is constructed by Yale School of Management. The International Center for Finance at Yale constructs stock market confidence indexes, including the individual One-Year Confidence Index and the Crash Confidence Index. The former refers to the percentage of the population that expect an increase in the Dow in the coming year, while the latter refers to the percentage of the population that attaches little probability to a stock market crash in the next six months. There is a positive correlation of 0.4007 between monthly equity fund flows and the

individual One-Year Confidence Index and a positive correlation of 0.4074 between fund flows and the Crash Index.

Investor risk preference proxy measured by the difference between equity fund flows and bond fund flows is related and compared to risk premia measured by Chen, Roll, and Ross (1986). Risk premia is a measure of risk tolerance and defined as the difference between return on a "Baa and under" bond (lower quality) portfolio and the return on a portfolio of long-term government bonds. According to Chen, Roll, and Ross, this variable has a mean of zero in a risk-neutral world and can be thought of as a measure of the degree of risk aversion implicit in pricing. The more risk-averse that investors are, the larger the difference between the return on a "Baa and under" bond portfolio and the return on a portfolio of long- term government bonds. My investor risk preference proxy suggests that the more risk-averse investors are, the smaller the difference between equity fund flows and bond fund flows because investors in such markets tend to direct their investments towards safer securities i.e. bonds rather than stock securities. Therefore, a negative relationship is expected between my risk preference proxy and Chen, Roll, and Ross's measure for degree of investor risk aversion. A correlation of -0.4086 is found between the two proxies. A negative relationship is also found when the difference between equity and bond fund flows is adjusted by total market capitalization.

The monthly IPO volume and equity fund flows have a correlation coefficient of 0.3968. Equity fund flows are positively associated with the IPO cycles and this leads to the following question: do equity fund flows predict the number of IPOs, or vice versa? Following Lowry and Schwert (2002), this question is addressed using the Granger Causality F-test, which indicates the incremental explanatory power of the predictor variable given two lags of the dependent variable in models for equity fund flows and the number of IPO. The p-value in the model as

observed in Table III, where equity fund flows is the dependent variable, suggests that the results fail to reject null that lagged IPO volume does not belong in the regression. In other words, IPO volume does not Granger cause equity fund flows. However, the p-value suggests that the results reject the null that lagged equity fund flows do not belong in the regression. In other words, equity funds flows Grange-cause IPO volume. Based on the Granger causality analysis in Table III, the direction of causality goes one-way from equity fund flows to monthly IPO volume, not vice versa.

III. Mutual Fund Flows and IPO Process

A. IPO Volume

Table IV presents time series OLS regression results on the relation between IPO issuance and sentiment as measured by equity fund flows. Dependent variables are the number of IPOs in each month; the total amount of proceeds raised each month deflated by CPI; the number of monthly IPOs scaled by number of publicly traded companies; and the total proceeds scaled by total market capital respectively. The four specification models intend to capture the dynamic between monthly equity fund flows and the IPO volume or proceeds collected. In Table IV, positive coefficients on the lagged two months equity fund flows imply that an increase in equity flows helps to explain the higher number of IPOs in the current month.[14] Investigating the proceeds collected from all IPOs in a month, model (2) in Table IV shows that for every $100 million increase in the prior month's equity fund flows, the current IPO proceeds increase by $3.24 million after adjusting for purchasing power.

[14] Poisson regression is used to deal with the count data dependent variable (the number of IPOs in Table IV). This is not reported in the paper. Positive coefficients from the lag two months still hold for the number of IPOs model. However, only lag one month coefficient shows significance at the 1% level.

There is a positive relation between monthly IPO volume and monthly equity fund flows, particularly in the two months prior to the IPO month. More specifically, equity fund flows from the prior two months lead the number of IPOs in the current month. In other words, more firms are likely to go public following a period of high sentiment. Based on the summary statistics in Table I, it takes about two to three months to file and get approval from the SEC. Positive sentiment during the two months prior to the IPO month suggests that going public firms align the timeline well and choose to file when they expect sentiment to remain high for the expected IPO date.

Lowry and Schwert (2002) suggest that there exists a lead-lag relationship between the average initial return per month and the IPO volume. In other words, more companies go public following a higher initial return period. According to Lowry and Schwert (2002), first-day return from IPO issuance reflects investment bankers' learning process, thereby causing initial returns to be serially correlated. They attribute the positive relation between initial returns and subsequent IPO volume to the positive information that is learned during the registration period but is only partially incorporated into the offer price. Therefore, prior two months average initial return is incorporated into the issuance regression for controlling information learned during the period before issuing date.

Lowry (2003) finds an economically significant influence of private firms' aggregate capital demands on the volume of IPOs. Therefore, the percentage change in real GDP between quarter *t* and *t+3* is used to proxy for future capital demand. First quarter dummy is also included in regressions since there are usually fewer IPOs in the first quarter of the year (Lowry, 2003).

According to Lowry (2003), market returns during the three quarters prior to the IPO or the average market-to-book ratio in the quarter prior to the IPO may increase in response to either

increase in investment opportunities, variation in the equity risk premium, or increase in investor optimism. Therefore, the market-to-book ratio and market return are included in the regressions to control for the above possible explanations on IPO volume fluctuation. The last trading observation of each security in the month is used to calculate its market capital; the market capital is then divided by its book value (quarterly book value is obtained from COMPUSTAT). The average of the market-to-book ratio among all publicly traded securities is used to find the market-wide lagged market-to-book ratio.

There is still a significant impact from the prior two months' equity flows on IPO volume after controlling for variables such as prior initial returns, first quarter dummy, future capital demand, past market return, and market to book ratio. Equity fund flows help to explain not only the number of issuances but also the proceeds collected from the IPO process. These findings indicate that companies attempt to time the market when going public. Fund flows in the prior two months lead to IPO volume and proceeds collected; this time line also coincides with the average number of days in registration.

There are many reasons that firms may choose to withdraw from the issuance market, one of which is investors' lack of enthusiasm for the IPO. Table V examines the impact of sentiment on firms' withdrawing decisions. Using equity fund flows as a proxy for investor sentiment, a negative relation is expected between fund flows and IPO volume in terms of number and proceeds. Table V shows monthly time series on both withdrawn volume and proceeds. Both proceeds adjusted by inflation and proceeds adjusted by total market capital are negatively affected by equity fund flows in the current month. An IPO firm can withdraw from the SEC filing if it senses that the market has turned cold for the IPO; therefore, the impact is more concurrent. The coefficient signs on volume specification are also negative but not statistically

pronounced. For models (1) and (3), there is a positive relationship between the number of withdrawn IPOs and fund flows from the prior month suggesting that there are more withdrawals following a month of high investor sentiment. The possible explanation here may come more IPO filings when sentiment is high. However, more firms withdraw from the IPO process due to the sudden drop in sentiment when sentiment turns cold in the following months. High sentiment in the prior month leads to more filings and later on turn into more withdrawals when sentiment suddenly goes down.

Future economic prospects measured by the percentage GDP growth may have a large impact on whether or not a private firm goes public. As Lowry (2003) illustrates, the number of IPOs in the market is positively related to both firms' future capital demands and business conditions. The number of IPOs is positively related to higher GDP growth in the future. GDP growth, market return, and market-to-book ratio are included as control variables in withdraw regressions. The findings of the current month equity fund flows coincide with IPO withdrawn activities, suggesting that firms withdraw from the security market when the sentiment turns unfavorable.

B. Filing Activities

Table VI relates firms' filing behavior to the predicted sentiment around the issuing date. If an issuing firm hopes to follow a trend of positive sentiment and take advantage of investor enthusiasm, it should file registration when the firm believes that sentiment is going to be favorable around the IPO date. It takes about three months from the day that a prospectus is filed for the SEC to declare the issue effective. Therefore, the following equation is used to predict sentiment in three months:

$$Flow_0 = b_3 * Flow_{-3} + b_4 * Flow_{-4} + b_5 * Flow_{-5} \quad (1)$$

where F*low*$_{-t}$ represents fund flows in past month *t*. Taking coefficients obtained from the previous model and the fund flow information available in the current and the prior two months, I use the above equation to predict equity fund flows in three months (see Appendices A and B for more details on full sample coefficients). However, full time period fund flow data are not available to issuers at the time of the filing decision. In other words, fund flow data after the filing day may not be relevant information for an issuer's filing decision. Therefore, I use a three year rolling model to predict future fund flows in Table VI.[15] For instance, a firm that intends to go public in three months will use fund flows from the past thirty six months to estimate the model coefficients. Applying these model coefficients on current and past two month flows, I can then predict sentiment around the IPO date.

A lagged initial return variable is included for control in the filing regression, since firms' filing activities are related to information learned from other firms' IPO process (Lowry and Schwert (2002)). High initial returns suggests good news from those issuance, therefore more firms engage in IPO process after a period of high initial returns. A firm's filing decision may also be related to investment opportunities captured from positive market-to-book variable. After controlling for the above variables, regression results show that the issuers' decisions to file are positively affected by the predicted sentiment in Table VI. The more favorable sentiment predicted by issuers, the more prospectus and amount of proceeds are filed. These results suggest that firms rationally file the IPOs when they expect sentiment to be high around their estimated IPO month.

[15] The regression results for predicted fund flows based on a five-year rolling window and the full sample period are not reported. However, the results are similar to those of three-year rolling window.

C. Price Revisions and Underpricing

Benvensite and Spindt (1989), Hanley (1993), Lougran and Ritter (2002), and Bradley and Jordan (2002) suggest a partial adjustment for the offer price with respect to all information in the IPO process. Within the framework of Derrien (2005), the offer price is set between the fundamental price and the price that noise traders are ready to pay. Derrien suggests that IPOs can be overpriced and still exhibit positive initial returns because of the noise traders in the market.

This study aims to understand the determinants of offer price revision along with final underpricing. During the IPO process, firms set a filing price range when they first submit an application to the SEC. The final offer price is usually set a day before the first IPO trading day. Because of this, offer price revision should be positively related to investors' valuation for the security around the IPO date. Underwriters or issuers incorporate higher valuation from investors into the pricing process but must reward investors for revealing positive information. When investors place a higher valuation for a security and reveal such information to underwriters, not only offer price is revised upwards but final underpricing is also higher to reward investors' reveal of information.

Table VII shows that equity fund flows from the current month positively affect average price revisions of IPOs in that month. Price revisions are measured as either the final offer price divided by original mid-file price or the final offer price divided by the original high-file price. There is a positive impact of current month flows on the firms' price revision.

As previously mentioned, issuers' predicted fund flows are estimated based on the information available prior to the filing date. Issuers set the original price range based on certain beliefs about future sentiment and are likely to adjust the final offer price when actual sentiment

deviates from their original expectation. Using a three-year rolling window regression, the predicted fund flows for expected IPO date are calculated. Subtracting predicted fund flows from actual fund flows gives us a proxy of surprise sentiment. Surprise sentiment should positively affect offer price revision. Table VII shows that price revision is positively affected by equity fund flows in the month of issuance. Furthermore, final price is also revised based on sentiment beyond originally expectation.

Table VIII illustrates that when investor sentiment is high in the month of an IPO issue, there is higher underpricing on average; this is consistent with Hypothesis 2.a. Dependent variables in Table VIII are monthly average initial return and monthly proceeds-weighted initial return respectively.

Proceeds-weighted initial return is the average initial returns based on proceeds weight relative to total proceeds from all IPOs in the month. Both regressions suggest that sentiment proxy in the current month is positively related to initial returns in the IPO month. The result is consistent with Benveniste and Spindt's model that more underpricings are rewarded to participants when higher valuation is revealed by regular participants. However, this does not rule out the possibility that individual investors have limited access to IPO allocation and therefore bid on the first-day closing price when sentiment is high.

In model (3) and (4), the lagged month initial returns are controlled, since the current initial return is positively related to past initial returns (Lowry and Schwert 2002). Johnson and Miller (1988) suggest that IPOs with prestigious bankers underprice less than those with non-prestigious bankers. Using the assigned underwriter ranking from Carter, Dark, and Singh (1998) and later updated by Ritter and Loughran (2004), the average underwriter prestige ranking in a month and the weighted average of underwriter ranking based on each IPO proceeds are

determined. The average IPO underpricing is positively related to the average underwriter reputation, which suggests that more prestigious underwriters leave more money on the table on average. According to Rock (1986), underpricing is related to the fundamental uncertainty of an issue. Underpricing is required to compensate uninformed investors for the information asymmetry risk that they bear when participating in an IPO. Among offering characteristics, a popular proxy for valuation uncertainty is gross proceeds. IPO proceeds are included to control for the uncertainty impact on IPO underpricing.

This section examines the impacts of sentiment on the entire IPO process. Empirical results indicate that equity fund flows as a proxy for investor sentiment help to explain various phenomenons from firms' filing behavior to issuing decision. Investor sentiment also plays a role in explaining offer price revision and eventual underpricing. Furthermore, sentiment is found to have a negative impact on firms' decision to withdraw from the equity market. Next section studies the role of investor risk preference on the IPO process, particularly in filing and issuing decisions.

IV. IPO Risk Characteristics and Investor Risk Preferences

Based on the preceding findings, it seems that private firms attempt to take advantage of favorable responses from investors to maximize the funds raised and avoid coming to the capital market when investor sentiment is low. Private firms may even attempt to take the advantage by looking into investor risk preferences around time of issuance. For instance, there may be relatively more safe companies in the IPO market when investors are relatively more risk averse. Companies could take advantage of favorable risk preferences and go public even in a market with low investor sentiment.

Table IX examines the characteristics of IPOs and investor risk preferences at the time of issuance. A high risk IPO is an issue where the aftermarket standard deviation of stock returns is greater than the average standard deviation of all stocks listed on the NYSE, AMEX, and NASDAQ stock markets in the month after the IPO. Investor risk preference is measured by the difference between equity fund flows and bond fund flows, adjusted by CPI or by total market capitalization depending on the model specification.[16] Based on the results from Table IX, the number of risky IPOs is positively affected by high risk flows two months prior to the IPO date as shown in model (1). The results in Table IX suggest that companies time the market with respect to investor risk preferences when going public. More high risk companies go public when investors are less risk averse in order to take advantage of the higher demand for risky stocks; this is consistent with hypothesis three.

The first quarter effect, capital demand proxy, past market condition, and market-to-book effect are included as control variables in the regression. Lowry and Schwert (2002) suggest that more firms go public when positive information is learn during the period of high underpricing. Underpricing specifically for issues that are categorized as high risk issues is calculated and is controlled in the high risk issuance regressions. After controlling for these variables, there is a significantly positive impact from the lagged two month high risk flows on high risk issuance. This suggests that issuers time the market to match the level of firm risk to investor risk preference at the time of issuance.

To examine issuers' filing behaviors from the perspective of firm risk characteristics, the issuers' filing decision are related to the predicted investor risk preference. Issuers form an expectation of future investor risk preferences and will only file when they believe that firms risk

[16] I also orthogonalize the difference between equity and bond fund flows on equity fund flows. Using the residuals from the orthogonalized model to measure investor risk preferences, the results for issuance, initial return, and filing behavior are consistent.

characteristics will remain favorable. Issuers estimate future risk preference based on information set available at time of filing.[17] Therefore, predicted investor risk preferences are calculated based on a three year rolling model. The following equation is used to predict investor risk preference in three months:

$$Riskflow_0 = b_3 * Riskflow_{-3} + b_4 * Riskflow_{-4} + b_5 * Riskflow_{-5} \quad (2)$$

where $Riskflow_{-t}$ represents investor risk preference in past month t and is measured by the difference between equity and bond fund flows adjusted either by CPI or total market capital, depending on regression specifications. Taking coefficients obtained from the above model and fund flows information available in the current and prior two months, this model allows us to predict investor risk preference in three months.

Table X suggests that companies rationally file their IPOs when they predict that future investor risk preferences will be favorable to the characteristics of the company. Regression models based on the frequency of high risk filings, the high risk IPO proceeds filed, the percentage of high risk IPO filed, and the percentage of high risk proceeds filed are all positively associated with the predicted high risk fund flows. The control variables here are similar to those in the filing regression from Table VI. Underpricing that is specific to issues that are categorized as high risk IPOs are calculated and included in the regression as controls. After controlling for these variables, it appears that issuers form some expectation of future investor risk preferences and try to file registrations when their firms' characteristics match the predicted risk preferences.

V. Conclusion

Using mutual fund flows data to proxy for investor sentiment, there is a leading effect of equity fund flows on the number of IPOs in the issuing market. Specifically, the number of IPOs

[17] For model coefficients based on full sample period, see Appendix A.

and proceeds from IPOs are positively related to equity fund flows starting from two months before an issue. A concurrent effect of equity flows on firms' withdrawn activities is also observed in the empirical results. Firms act quickly and respond to low investor sentiment by exiting capital markets. Not only does sentiment as proxy by equity fund flows affect issuing volume, it also has an impact on first-day return and price revision. Depending on the realized degree of investor sentiment, issuers try to take advantage of investor valuation for securities and adjust the offer price accordingly. There is a positive association between investor sentiment and the final offering price relative to the original filing prices. In addition to final offer price, high sentiment is also reflected in a higher degree of underpricing.

Examining firms' filing behavior, the results show that firms rationally file their prospectus with the SEC when the predicted sentiment is high for the expected IPO date. Issuers form expectations on future sentiment based on available information set using fund flows. Predicted fund flows are found to be associated with more filing activities i.e. more number of filings and proceeds filed.

Furthermore, investor risk preferences vary over time as indicated by the difference between equity fund flows and bond fund flows adjusted by total market capitalization. The results suggest that investor risk preferences in the prior month lead the percentage of high risk issues. In terms of filing behavior, issuers rationally file their IPOs when the predicted risk preference around the expected IPO date matches the risk characteristics of the IPOs. Issuers time the market based on their best knowledge of predicted investor sentiment and risk preferences.

In general, issuers market their securities by timing investor sentiment and investor risk preferences. By doing so, firms avoid coming into a bad market and further maximize opportunities by matching firm characteristics to the degree of investor risk preference.

Sentiment proxy by equity fund flows also play an important role in offer price revision and first-day returns. Moreover, issuers seem to form an expectation on future sentiment and investor risk preferences; consequently, firms file registrations with the SEC based on their beliefs of future investor preferences measured by equity mutual fund flows.

This study intends to shed some lights on the importance of sentiment and its impact on issuers and IPO allocation participants. Using U.S. open-end mutual fund flows, investor demand for equities and investor risk preferences for stocks with different risk characteristics are measured at the same time. Sentiment as measured by equity fund flows seems to have an effect on the offering price relative to initial filing range. Thus, successfully timing the market enables issuers to raise final offering prices and maximize proceeds raised in the IPOs. More equity fund flows also result in a higher average underpricing and thus a higher initial return for allocation participants. Successfully timing the market and participating in hot IPOs enables investors to obtain investment gains. Throughout this approach, this study hopes to capture investor preferences in the capital market and make inferences on firms' ability to time their offerings.

This study proposes to link investor preferences to the full IPO process including filing, withdrawing, price setting, and issuing. Using the unique fund flow proxy, this paper makes inferences on investor sentiment and risk preferences from fund flow data. Future research may build upon this understanding for fund flows and relate investor preferences to other types of security issuance. Given the unique characteristics of flows, future research is also able to detangle general sentiment from risk tolerance of investors and apply them for different sets of financial analysis.

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Table I
Descriptive Statistics

Shown here is the time profile and selected characteristics of a sample of 5,631 IPOs completed between 1986 and 2004, as listed in Securities Data Company (SDC) database. IPOs that are ADRs, units, REITs, offer price less than $5, and closed-end funds are excluded. Proceeds refer to the average proceeds (in millions) raised each issue adjusted by the Consumer Price Index (CPI base year 1983 published by Bureau of Labor Statistics). Initial Return refers to average first day return measured as the percentage return from the offer price to first day closing price. Offer Price shows the average offer price from all IPOs completed in each year. Day is the average number of days in registration.

	Number of IPOs	Proceeds (million $)	Initial Return %	Offer Price ($)	Day
86-04	5631	39.83	20.49	12.21	78.63
1986	469	26.87	6.47	11.07	36.25
1987	316	26.28	5.45	10.67	48.54
1988	127	20.06	6.53	9.96	48.63
1989	118	28.01	7.80	11.28	53.14
1990	112	22.09	10.55	10.92	60.22
1991	263	32.20	15.42	12.04	67.27
1992	379	33.14	9.93	11.61	83.83
1993	501	36.28	12.78	12.38	77.79
1994	373	24.87	9.28	10.72	77.79
1995	439	32.32	21.37	12.35	77.42
1996	641	27.45	16.89	11.85	78.64
1997	460	33.78	13.33	12.34	93.07
1998	284	34.24	22.61	12.13	90.19
1999	434	59.46	72.71	14.49	91.68
2000	334	79.72	56.82	14.67	97.48
2001	75	145.90	20.27	15.31	155.68
2002	68	140.66	13.25	14.56	146.32
2003	63	76.80	13.19	14.39	119.68
2004	175	69.51	11.84	12.68	82.75

Table II
Descriptive statistics on investor preference proxy

This table provides descriptive statistics for monthly equity fund flows and investor risk preference/preference proxy as reported on the Investment Company Institute (ICI) website. Investor sentiment proxies include monthly equity fund flows (in millions), equity fund flows adjusted by Consumer Price Index (CPI base year 1983 published by Bureau of Labor Statistics), and normalized equity fund flows (adjusted by total market cap). Investor risk preference proxies include the difference between monthly equity and bond fund flows in millions of dollars, the difference between monthly equity and bond fund flows adjusted by CPI, and difference between monthly equity and bond fund flows normalized by total market cap.

	Investor Sentiment Proxy			Investor Risk Preference Proxy		
	Equity Fund Flows	Equity Fund Flows adjusted by CPI	Equity Fund Flows adjusted by market cap	(Equity-Bond) Flows	(Equity-Bond) adjusted by CPI	(Equity-Bond) adjusted by market cap
86-04	8,585.28	5,347.89	0.0995%	6,231.04	3,740.63	0.0543%
1986	1,810.35	1,656.00	0.0707%	-6,741.01	-6,146.42	-0.2670%
1987	1,586.87	1,426.37	0.0464%	1,019.57	868.75	0.0286%
1988	-1,342.33	-1,133.17	-0.0493%	-968.41	-823.01	-0.0355%
1989	482.43	380.44	0.0135%	584.53	463.85	0.0170%
1990	1,067.57	827.58	0.0326%	549.67	432.90	0.0165%
1991	3,286.56	2,406.42	0.0887%	-1,621.24	-1,191.33	-0.0458%
1992	6,579.13	4,688.42	0.1569%	663.87	466.06	0.0145%
1993	10,783.13	7,461.49	0.2229%	4,673.29	3,224.22	0.0947%
1994	9,912.33	6,702.81	0.1910%	15,292.42	10,318.22	0.2964%
1995	10,631.38	6,966.42	0.1713%	11,509.54	7,546.35	0.1870%
1996	18,072.83	11,544.99	0.2361%	17,842.82	11,397.55	0.2332%
1997	18,940.34	11,801.99	0.1910%	16,574.61	10,333.02	0.1689%
1998	13,325.70	8,194.60	0.1065%	7,092.17	4,368.79	0.0550%
1999	15,418.09	9,242.56	0.1009%	15,879.13	9,494.78	0.1019%
2000	24,734.48	14,427.70	0.1395%	29,164.53	17,021.41	0.1646%
2001	2,569.42	1,462.81	0.0119%	-4,710.83	-2,647.97	-0.0392%
2002	-2,374.92	-1,284.18	-0.0295%	-14,167.92	-7,839.12	-0.1262%
2003	12,694.08	6,882.78	0.0934%	10,028.58	5,416.86	0.0660%
2004	14,942.83	7,953.81	0.0958%	15,724.50	8,367.07	0.1011%

Table III
Do Equity Fund Flows Predict the Number of IPOs, or Vice Versa?

Granger F-tests indicate the incremental explanatory power of the two lags of the predictor variables, given two lags of the dependent variable in models for equity fund flows and the IPO volume. Equity fund flows $Flow_{-t}$ is the monthly equity flows from the Investment Company Institute (ICI) dataset; $Flow_{t-1}$ and $Flow_{t-2}$ are equity fund flows from the prior one and two months. IPO Volume is the number of IPOs issued in the month; $NIPO_{-1}$ and $NIPO_{t-2}$ are the number of IPOs issued in the prior one and two months respectively. t-statistics is provided in parenthesis.*, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	SDC Data, 1986 to 2004	
	Equity Fund Flows	Number of IPOs
	Coefficient	Coefficient
Regressors		
Constant	764.89000	4.38100 ***
	(1.31)	(3.30)
$Flowt_{-1}$	0.48510 ***	0.00053 ***
	(7.40)	(3.57)
$Flowt_{-2}$	0.19730 ***	-0.00011
	(2.92)	(-0.73)
$NIPOt_{-1}$	1.86850	0.61950 ***
	(0.06)	(9.30)
$NIPOt_{-2}$	36.86570	0.11000 *
	(1.30)	(1.71)
R-Squared	0.4643	0.6164
Granger *F*-tests		
Lagged NIPO	1.82	
p-value	0.1652	
Lagged Flows		7.68 ***
p-value		0.0006

Table IV
IPO Issuance and Equity Fund Flows

This table shows monthly regressions in which the dependent variables are the number of IPO issuance, the total proceeds raised adjusted by Consumer Price Index (CPI base year 1983 published by Bureau of Labor Statistics), the percentage of IPO issuance relative to the number of publicly traded companies, and the percentage of total proceeds collected from IPOs relative to total market capitalization. Investor sentiment proxies ($Flow_{-t}$) are the monthly equity fund flows from the prior month t adjusted by CPI in models (1) and (2) and adjusted by the total market capitalization in models (3) and (4), respectively. IR_{-t} is the prior *t* month average initial return. *Growth* equals the percentage change in real GDP between quarter *t* and quarter *t+3* (the seasonally adjusted annually rate). *Q1* equals one for the first quarter; for all other quarters, it is zero. MB_{-1} represents the average market-to-book ratio from the prior month, and EW_{-1} represents equal-weighted market return from the prior month. t-statistics is provided in parenthesis. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	Model (1)	Model (2)	Model (3)	Model (4)
Dependant	Number of IPOs	Total Proceeds	% of IPO	% of Proceeds
$Flow_{-1}$	0.00045 **	0.03240 **	0.48040 ***	4.88820 *
	(2.23)	(2.18)	(2.93)	(1.76)
$Flow_{-2}$	0.00049 ***	0.03630 **	0.49450 ***	3.68810 *
	(2.63)	(2.64)	(3.61)	(1.66)
$Flow_{-3}$	-0.00020	-0.01010	-0.05930	0.51580
	(-1.13)	(-0.85)	(-0.45)	(0.24)
IR_{-1}	0.05480	6.39790 **	0.00001	0.00004
	(1.19)	(2.23)	(1.21)	(0.50)
IR_{-2}	-0.02400	7.54610 **	0.00000	0.00010
	(-0.52)	(2.57)	(-0.35)	(1.12)
Q1	-8.92390 ***	-356.94000 ***	-0.00112 ***	-0.00943 ***
	(-4.83)	(-2.95)	(-4.8)	(-2.64)
Growth	3.09600 **	58.31750	0.00035	0.00157
	(2.08)	(1.15)	(2.01)	(0.63)
EW_{-1}	11.23370	823.57080	0.00044	0.02100
	(0.62)	(0.65)	(0.18)	(0.55)
MB_{-1}	0.17740	10.87610	0.00002	0.00033
	(1.11)	(1.12)	(1.02)	(1.08)
Durbin-Watson	2.0735	1.9979	2.0643	1.9946
R-Squared	0.6557	0.4162	0.6489	0.3958

Table V
Monthly Time Series Analysis of Withdrawn IPOs and Proceeds

This table shows monthly regressions in which the dependent variable is the number of IPOs withdrawals, the sum of the proceeds from withdrawal IPOs adjusted by Consumer Price Index (CPI base year 1983 published by Bureau of Labor Statistics), the percentage of the number of withdrawals relative to the number of publicly traded firms, and the sum of the proceeds from withdrawal IPOs relative to the total market cap. Investor sentiment proxy ($Flow_{-t}$) is the monthly equity fund flows adjusted by CPI in models (1) and (2) and adjusted by total market cap in models (3) and (4). *Growth* equals the percentage change in real GDP between quarter *t* and quarter *t+3* (seasonally adjusted annually rate). MB_{-1} represents the average market-to-book ratio from the prior month, and EW_{-1} represents equal-weighted market return from the prior month. t-statistics is provided in parenthesis. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Dependant	Model (1) Number of Withdrawals	Model (2) Proceeds of Withdrawals	Model (3) % of Withdrawals	Model (4) % of Proceeds Withdrawals
$Flow_{0}$	-0.00006	-0.00883 **	-0.08130	-12.28040 ***
	(-0.95)	(-2.34)	(-1.54)	(-2.63)
$Flow_{-1}$	0.00016 *	0.00496	0.12390 *	5.15600
	(1.89)	(0.98)	(1.77)	(0.81)
$Flow_{-2}$	0.00007	0.00412	0.04320	8.08560
	(0.98)	(0.98)	(0.74)	(1.55)
Growth	-1.11770 **	-26.13240	-0.00016 **	-0.00388
	(-2.34)	(-0.93)	(-2.56)	(-0.79)
EW_{-1}	-26.60500 ***	-1172.00000 **	-0.00336 ***	-0.18760 *
	(-3.30)	(-2.50)	(-3.16)	(-1.96)
MB_{-1}	0.25080 **	13.99140 ***	0.00003 ***	0.00171 **
	(3.08)	(3.12)	(2.82)	(2.01)
Durbin-Watson	1.9955	1.9762	2.0144	1.9925
R-Squared	0.3535	0.2924	0.3111	0.1562

Table VI
Forecasting Fund Flows at Time of Filing

This table shows OLS regressions where the dependent variables are the number of IPO filings, the total proceeds filed adjusted by Consumer Price Index (CPI base year 1983 published by Bureau of Labor Statistics), the percentage of IPOs filed relative to the number of publicly traded companies listed on NYSE, AMEX, and NASDAQ , and the total proceeds of IPOs filed in month *t* adjusted by market capital. *Predflow* is the predicted third month fund flows based on a three-year rolling model: $Flow_0 = b_3 * Flow_{-3} + b_4 * Flow_{-4} + b_5 * Flow_{-5}$. $Flow_{-t}$ is the monthly equity fund flow adjusted by CPI in models (1) and (2) and adjusted by total market capitalization in models (3) and (4). MB_{-1} represents the average market-to-book ratio from the prior month. EW_{-1} represents equal-weighted market return from the prior month. IR_{-t} is the average initial return in past month *t*. *Growth* equals the percentage change in real GDP between quarter *t* and quarter *t+3* (seasonally adjusted annually rate). t-statistics is provided in parenthesis. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Dependant	Model (1) Number of Filings	Model (2) Proceeds Filed	Model (3) % of IPOs Filed	Model (4) % of Proceeds Filed
Predicted Flow	0.00113 ***	0.07390 ***	0.43010 **	0.91400
	(2.72)	(4.66)	(2.24)	(0.06)
MB_{-1}	0.22180	2.86330	0.00002	0.00160
	(1.28)	(0.30)	(1.01)	(0.68)
EW_{-1}	18.27640	192.48760	0.00253	0.19250
	(1.33)	(0.21)	(1.48)	(0.98)
IR_{-1}	-0.02960	1.01380	0.00000	-0.00052
	(-0.62)	(0.36)	(-0.50)	(-0.88)
IR_{-2}	0.00885	12.32330 ***	0.00000	0.00082
	(0.19)	(4.42)	(0.19)	(1.40)
Growth	2.86320 *	93.36840 *	0.00035 *	0.03670 **
	(1.92)	(1.86)	(1.78)	(2.36)
Durbin-Watson	1.9421	1.9850	1.9432	1.9760
R-Squared	0.6337	0.4024	0.6146	0.2909

Table VII
Price Revision and Investor Sentiment

This table shows monthly regressions where the dependent variables are the average IPO offer price relative to the original mid-filing price in month *t* and the average IPO offer price relative to the original high-filing price. Investor sentiment proxy ($Flow_{-t}$) is the monthly equity fund flow adjusted for total market capitalization. MB_{-1} represents the average market-to-book ratio from the prior month. EW_{-1} represents the equal-weighted market return from the prior month. *CMrank* is the monthly average of underwriter prestige rankings based on Carter, Dark, and Singh (1998) and Ritter and Loughran (2004). *Surprise Flow* is the difference between the current month $Flow_0$ and the predicted fund flows made for the prior three months. Predicted fund flow is calculated based on a three-year rolling model: $Flow_0 = b_3 * Flow_{-3} + b_4 * Flow_{-4} + b_5 * Flow_{-5.}$ t-statistics is provided in parenthesis. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Dependant	Average Offer/Mid Filing	Average Offer/High Filing	Average Offer/Mid Filing	Average Offer/High Filing
$Flow_0$	17.16100 *	15.70200 *		
	(1.92)	(1.86)		
$Flow_{-1}$	-17.54730	-15.12250		
	(-1.49)	(-1.36)		
$Flow_{-2}$	15.31040	12.58480		
	(1.63)	(1.41)		
Surprise Flow			28.55220 ***	25.72920 ***
			(2.87)	(2.75)
MB_{-1}	-0.00178	-0.00163	-0.00121	-0.001088
	(-0.73)	(-0.70)	(-0.50)	(-0.47)
EW_{-1}	0.52730 ***	0.41580 **	0.32420 **	0.23970 *
	(2.96)	(2.45)	(2.48)	(1.94)
CMrank	-0.00251	-0.01060	0.00088	-0.00816
	(-0.27)	(-1.19)	(0.09)	(-0.91)
Durbin-Watson	1.7611	1.7610	1.7313	1.7375
R-Squared	0.3367	0.3049	0.3364	0.3086

Table VIII
Monthly Time Series Analysis of Initial Returns

This table shows monthly regressions where the dependent variable is the initial return. The average initial return is the average difference between the first closing price and the offer price for all IPOs in month *t*. IR is the arithmetic average of initial return from all IPOs in the month. Proceed-weighted initial return (Prowgt IR) is calculated by summing all initial returns based on proceeds weighted in the month of the IPOs. Investor sentiment proxy ($Flow_{-t}$) is the monthly equity fund flows adjusted by total market capitalization. IR_{-t} is the prior *t* month average initial return in models (1) and (3) and the proceed-weighted average return from past month *t* in models (2) and (4). *Meanpro* represents the average proceeds of all IPOs in the month. *CMrank* is the monthly average of underwriter prestige rankings based on the work of Carter, Dark, and Singh (1998) and Ritter and Loughran (2004). t-statistics is provided in parenthesis. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	Model (1)	Model (2)	Model (3)	Model (4)
Dependant	IR	Prowgt IR	IR	Prowgt IR
$Flow_{0}$	3701.00000 **	3941.00000 *	3297.00000 *	3614.00000 *
	(1.99)	(1.92)	(1.93)	(1.96)
$Flow_{-1}$	-5126.00000 ***	-4838.00000 **	-6166.00000 ***	-6112.00000 ***
	(-2.63)	(-2.25)	(-3.29)	(-2.93)
$Flow_{-2}$	2137.00000	2295.00000	1997.00000	2149.00000
	(1.14)	(1.11)	(1.14)	(1.14)
Meanpro	0.07960 *	-0.00991	0.04910	-0.01360
	(1.68)	(-0.19)	(1.19)	(-0.32)
CMrank	4.34100 **	7.35130 ***	4.45450 **	6.15900 ***
	(1.96)	(2.98)	(2.05)	(2.67)
IR_{-1}			0.31340 ***	0.39190 ***
			(4.70)	(5.04)
IR_{-2}			0.59070 ***	0.53340 ***
			(8.66)	(6.91)
Durbin-Watson	1.5841	1.5456	2.0208	2.0618
R-Squared	0.4868	0.3698	0.6386	0.5700

Table IX
High Risk IPOs and Investor Risk Preferences

This table shows monthly regressions where the dependent variables are the number of high risk IPOs in month *t*, the total proceeds of high risk IPOs in month *t* adjusted by Consumer Price Index (CPI base year 1983 published by Bureau of Labor Statistics), the number of high risk IPOs relative to the total number of IPOs issued in month *t*, and the proceeds of high risk IPOs relative to the total proceeds from all IPOs in the month. A high risk IPO is an issue where the aftermarket standard deviation of stock returns is greater than the mean standard deviation of all stocks listed on NYSE, AMEX, and NASDAQ in the month after the IPO. Aftermarket standard deviation of stock returns is calculated using the first 30 return observations starting from the third trading day. $Riskflow_{-t}$ is a risk preference proxy that equals the difference between equity fund flows and bond fund flows adjusted by CPI in models (1) and (2) and by total market capitalization in models (3) and (4). $RiskIR_{-t}$ represents the average first-day return of risky issues from prior month *t*. *Growth* equals the percentage change in real GDP between quarter *t* and quarter *t+3* (seasonally adjusted annually rate). MB_{-1} represents the average market-to-book ratio from the prior month. EW_{-1} represents equal-weighted market return from the prior month. t-statistics is provided in parenthesis. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

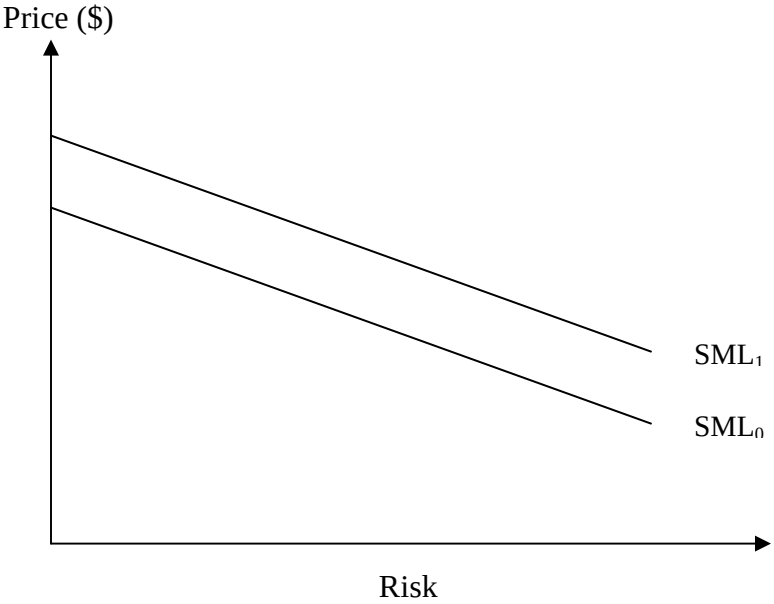
Dependant	Model (1) Number of High Risk IPOs	Model (2) Total Proceeds of High Risk IPOs	Model (3) % of High Risk IPOs	Model (4) % of High Risk IPO Proceeds
$Rsikflow_{-1}$	0.00020	0.01820 ***	-19.25970	-8.96620
	(1.56)	(3.08)	(-1.22)	(-0.45)
$Rsikflow_{-2}$	0.00039 ***	0.01160 *	42.26580 **	29.84420
	(3.18)	(1.93)	(2.45)	(1.30)
$Rsikflow_{-3}$	-0.00001	-0.00409	23.98150	17.57620
	(-0.07)	(-0.77)	(1.60)	(0.95)
$RiskIR_{-1}$	0.08330 ***	4.72760 ***	0.00146 **	0.00130 *
	(3.47)	(4.46)	(2.42)	(1.76)
$RiskIR_{-2}$	-0.01050	1.21680	0.00012	0.00027
	(-0.64)	(1.65)	(0.29)	(0.52)
EW_{-1}	18.40880	218.75430	-0.36820	-0.79420 **
	(1.62)	(0.40)	(-1.34)	(-2.37)
MB_{-1}	0.25730 *	4.10440	0.00094	-0.00400
	(1.96)	(0.70)	(0.31)	(-1.18)
Growth	2.19860 ***	19.59060	-0.00815	-0.00223
	(2.73)	(0.64)	(-0.44)	(-0.12)
Q1	-4.78190 ***	-125.52820 **	-0.01550	0.02630
	(-3.60)	(-2.09)	(-0.52)	(0.77)
Durbin-Watson	2.0463	1.7816	2.0045	1.9717
R-Squared	0.6353	0.6345	0.5435	0.3560

Table X
Forecasting High Risk Fund Flows at Time of Filing

This table shows monthly regressions where the dependent variables are the number of high risk IPOs filings, the proceeds of high risk IPOs filed adjusted by Consumer Price Index (CPI base year 1983 published by Bureau of Labor Statistics), the number of high risk IPOs filed relative to the total number of IPO filings, and the proceeds of high risk IPOs filed relative to the total proceeds of IPOs filed in a given month. A high risk IPO is an issue where the aftermarket standard deviation of stock returns is greater than the mean standard deviation of all stocks listed on NYSE, AMEX, and NASDAQ stock markets in the month after the IPO. Aftermarket standard deviation of stock returns is calculated using the first 30 return observations starting from the third trading day. *Predriskflow is* the predicted third month fund flows based on a three-year rolling model: $Flow_0 = b_3 * Flow_{-3} + b_4 * Flow_{-4} + b_5 * Flow_{-5.}$ $Flow_{-t}$ is the difference between monthly equity and bond fund flows adjusted by CPI in models (1) and (2), and normalized by total market capitalization in models (3) and (4). MB_{-1} represents the average market-to-book ratio from the prior month. EW_{-1} represents the equal-weighted market return from the prior month. $RiskIR_{-t}$ represents the prior month average initial return from high risk IPOs. *Growth* equals the percentage change in real GDP between quarter *t* and quarter *t+3* (seasonally adjusted annually rate). t-statistics is provided in parenthesis. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

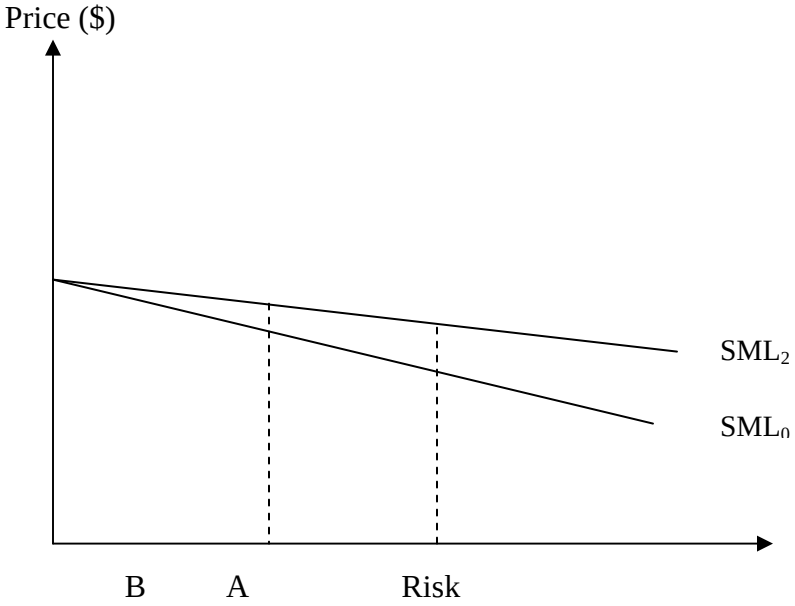
Dependant	Model (1) Number of High Risk Filings	Model (2) Proceeds of High Risk Filed	Model (3) % of High Risk IPOs Filed	Model (4) % of High Risk Proceeds Filed
Predriskflow	0.00047 ***	0.01880 **	33.44700 **	42.05430 **
	(2.66)	(2.33)	(1.97)	(2.31)
EW_{-1}	12.16420	171.29020	0.20200	0.00841
	(1.35)	(0.41)	(1.01)	(0.03)
MB_{-1}	0.10780	1.49490	0.00008	-0.00056
	(1.08)	(0.31)	(0.04)	(-0.22)
Growth	1.73410 **	25.83830	0.00612	0.00951
	(1.99)	(0.64)	(0.34)	(0.48)
$RiskIR_{-1}$	0.00625	1.06140	0.00015	-0.00015
	(0.43)	(1.54)	(0.45)	(-0.34)
$RiskIR_{-2}$	-0.00365	-0.07910	-0.00035	0.00008
	(-0.25)	(-0.11)	(-1.08)	(0.18)
Durbin-Watson	1.9873	2.0048	1.9717	1.9767
R-Squared	0.6395	0.6279	0.5765	0.3681

Figure 1: Security Market Line with Investor Sentiment



SML_0 represents the security market line where investors are fully rational; SML_1 represents a market where investors are overly optimistic therefore overprice securities. In such a market, companies have greater incentives to issue more overpriced equities to investors.

Figure 2: Security Market Line with Investor Risk Preferences



SML_0 represents the original security market line; SML_2 represents a market where investors become less risk averse. In such a market, investors place greater value on risky firm A compared to less-risky firm B. Therefore, company A has a higher incentive to issue equities in a market of high risk tolerance.

Appendix A

This table shows the coefficients of the forecasting model ($Flow_0 = b_3*Flow_{-3} + b_4*Flow_{-4} + b_5*Flow_{-5}$) for predicted equity fund flows. $Flow_0$ represents the current month equity fund flows, while $Flow_{-t}$ represents fund flows from past month *t*.

	Intercept	B_3	B_4	B_5
coefficient	1781	0.3453	0.1033	0.2051
t-stat	2.83	6.02	1.81	3.58

The following table shows the coefficients of the forecasting model ($Riskflow_0 = b_3*Riskflow_{-3} + b_4*Riskflow_{-4} + b_5*Riskflow_{-5}$) for predicted investor risk preferences. $Riskflow_0$ equals the difference between the current month equity and current month bond fund flows, adjusted by total market capitalization. $Riskflow_{-t}$ represents investor risk preference proxy from past month *t*.

	Intercept	B_3	B_4	B_5
coefficient	0.000179	0.3308	0.1291	0.2960
t-stat	1.59	5.66	2.23	5.10

Appendix B

This table shows monthly regressions where the dependent variable is the total proceeds of filings (in millions of dollars) in any given month. The sample period is 1986 to 2004. Investor sentiment proxy is the monthly equity fund flows adjusted for inflation ($Flow_{-t}$ in millions of dollars) from the Investment Company Institute. *PredFlow* represents the predicted third month fund flows based on the coefficients from the following model: $Flow_0 = b_3*Flow_{-3} + b_4*Flow_{-4} + b_5*Flow_{-5.}$ $Flow_{-t}$ represents fund flows from month *t*. t-statistics is provided in parenthesis. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	Dependent Variable: Proceeds of Filings											
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
$Flow_{-3}$	0.0326	**									0.0361	**
	(2.16)										(2.38)	
$Flow_{-2}$	0.0345	**									0.0282	*
	(2.21)										(1.78)	
$Flow_{-1}$	0.0580	***									0.0591	***
	(3.72)										(3.77)	
$Flow_0$	0.0194										0.0005	
	(1.29)										(0.31)	
$Flow_{+1}$			0.0548	***							0.0372	**
			(3.52)								(2.38)	
$Flow_{+2}$			0.0194		0.0305	*					-0.0051	
			(1.23)		(1.94)						(-0.33)	
$Flow_{+3}$			0.0168		0.0200		0.0204		0.0134		0.0009	
			(1.09)		(1.28)		(1.31)		(0.90)		(0.06)	
PredFlow									0.1492	***		
									(4.47)			
R-Squared	0.44		0.36		0.33		0.33		0.37		0.46	