

# **Why are firms that raise more financing worth more?**

AMBRUS KECSKÉS\*

## **Abstract**

I study the financing decisions of firms going public. I find that, all else equal, firms that raise more financing are worth more, and I consider potential explanations for this finding. I provide evidence that raising more financing leads to greater investor recognition, as proxied by better underwriting services, greater liquidity, and greater investor interest, and thereby increases firm value. Additionally, I find some evidence that supports the fixed costs of raising financing explanation but no evidence that supports the market timing explanation. The results do not appear to be driven by investment opportunities or firm quality.

First version: April 2007

This version: March 11, 2008

JEL classifications: G32 (Financing Policy; Capital and Ownership Structure)

Keywords: Initial public offerings, financing, cash, investor recognition, fixed costs, market timing, underwriting, liquidity, analyst coverage, breadth of ownership, valuation

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\*Joseph L. Rotman School of Management, University of Toronto. Email: [ambrus.kecskes03@rotman.utoronto.ca](mailto:ambrus.kecskes03@rotman.utoronto.ca). I greatly appreciate the comments of Bill Bobey, Laurence Booth, Sergei Davydenko, Gus De Franco, François Derrien, Craig Doidge, Alexander Dyck, David Goldreich, Lisa Kramer, Stephannie Larocque, Jan Mahrt-Smith, Dave Mauer, Darius Miller, Lukasz Pomorski, Jay Ritter, Kumar Venkataraman, Michel Vetsuypens, Kent Womack, and seminar participants at Boston College, HEC Paris, the George Washington University, Rice University, Southern Methodist University, the University of Alberta, the University of Colorado at Boulder, the University of Florida, the University of Georgia, the University of Iowa, the University of Notre Dame, the University of Toronto, the University of Rochester, Virginia Tech, and Wilfrid Laurier University.

## **1. Introduction**

Firms going public can choose both the price and the quantity of the financing that they raise. There is a vast literature on the price of financing that firms choose (see Jenkinson and Ljungqvist (2001) and Ritter and Welch (2002) for a review of the literature on IPO underpricing). However, the quantity of financing that firms choose remains largely unexplored even though financing may matter for firm value and thus have implications for investors and managers alike. Moreover, it is not obvious why firms sell so many shares at so high a cost when they go public. The typical firm sells 29.9% of its shares even as underwriting fees and underpricing amount to 13.5% of the value of the shares sold. I therefore explore this subject in this paper.

I first study how financing is related to firm value, and I find that, all else equal, firms that raise more financing are worth more. I then study why this is the case. As one potential explanation, I consider the investor recognition hypothesis, which states that raising more financing leads to greater investor recognition, i.e., greater investor awareness of the firm, and greater investor recognition increases firm value. Using several proxies for investor recognition, I find that raising more financing is associated with greater investor recognition, and that the investor recognition caused by raising more financing is associated with higher firm value. I also consider two other potential explanations for why firms that raise more financing are worth more. I find some evidence that supports the fixed costs of raising financing explanation but no evidence that supports the market timing explanation. Robustness tests suggest that the results do not appear to be driven by investment opportunities or firm quality, the exercise of the underwriter's overallotment option, hot issues markets, or reverse causality. Overall, the

evidence most strongly supports the investor recognition explanation of why firms that raise more financing are worth more.

I begin my analysis by studying how financing is related to firm value. I focus on financing from the sale of primary shares (new shares issued by the firm) rather than secondary shares (existing shares sold by pre-IPO investors) because the typical firm raises financing mostly from primary share sales (85.6% on average). Firms raise financing for standard reasons such as financing investments, holding cash, and repaying debt. Therefore, instead of using actual financing raised, I use "excess financing" defined as actual cash holdings after the IPO minus expected cash holdings, where I estimate expected cash holdings using an empirical model of cash holdings used by Opler, Pinkowitz, Stulz, and Williamson (1999), Dittmar and Mahrt-Smith (2007), and Bates, Kahle, and Stulz (2007). These empirical models primarily capture the transactions and precautionary motives for holding cash, i.e., holding cash to avoid the transaction costs of issuing securities when the firm requires external financing and holding cash to finance investment opportunities internally that may arise when external financing is prohibitively costly, respectively. Excess financing also has the advantage of being estimated after the firm has repaid debt using some of the proceeds of the offering. To measure firm value, I match each IPO firm to a comparable seasoned firm, comparable in terms of industry, size, etc., and I compute relative valuation ratios, such as the market-to-book of the IPO firm divided by the market-to-book of the matched firm.

I find that firms that raise more financing at the IPO are worth significantly more even five years after going public. A simple analysis of the choice of price and quantity by pre-IPO shareholders suggests that the magnitude of the impact of financing on firm value that I document is consistent with pre-IPO shareholders optimizing. I then study why firms that raise

more financing are worth more. I consider three potential explanations, namely, the investor recognition, fixed costs of raising financing, and market timing explanations. In my empirical tests, I find evidence that strongly supports the investor recognition explanation, I find some evidence that supports the fixed costs of raising financing explanation, but I find no evidence that supports the market timing explanation.

First, the investor recognition hypothesis states that raising more financing leads to greater investor recognition and thereby increases firm value. Merton (1987) develops a model in which greater investor recognition leads to more efficient risk sharing, which decreases the cost of capital and thereby increases firm value. I argue that raising more financing leads to greater investor recognition in two ways. First, by selling more shares, the firm pays its underwriter more, both directly in fees and indirectly through the dollar value of underpricing that the underwriter can allocate to its preferred investor clients. The underwriter works harder at marketing the firm, and investor recognition increases. Second, by selling more shares, the firm can directly increase the number of its investors, thus investor recognition increases. Moreover, as a result of the increase in the number of its investors, liquidity in the firm's shares improves (for example, see Benston and Hagerman (1974)), which makes the firm a more attractive investment for liquidity-oriented investors, especially institutional investors, thus investor recognition increases further. Therefore, in both these ways, raising more financing leads to greater investor recognition and thereby increases firm value. I am agnostic about whether greater investor recognition decreases expected returns and/or increases expected cash flows. Greater investor recognition can decrease expected returns as in Merton (1987) but it can also increase expected cash flows through greater information production, through more monitoring, and even through greater demand for the firm's product. The literature has argued for both

drivers of firm value. The bottom line is that if information is costly, then pre-IPO shareholders may find it optimal to give underpriced shares to investors in the IPO to reduce these information costs, which leads to greater investor recognition and thereby increases firm value.

In my empirical tests of the investor recognition hypothesis, I use three groups of proxies for investor recognition, namely, proxies for underwriting services, liquidity, and investor interest (analyst coverage and breadth of ownership). Additionally, I account for underpricing because underpricing more can also lead to greater investor recognition (see Chemmanur (1993), Aggarwal, Krigman, and Womack (2002), and Cliff and Denis (2004)). I find that raising more financing is associated with greater investor recognition, and that the investor recognition caused by raising more financing is associated with higher firm value, even controlling for the investor recognition not caused by raising more financing. My results provide direct support for the investor recognition explanation.

Second, the fixed costs of raising financing hypothesis states that if there are fixed costs associated with raising financing, then firms with relatively higher fixed costs should raise more financing but should do so less frequently. Otherwise, firm value is destroyed either because the firm has to raise more financing subsequently or because the firm does not have the financing to exploit its investment opportunities. I test the fixed costs hypothesis using two interpretations of fixed costs. First, I interpret as fixed costs the direct costs of raising financing (see Lee, Lochhead, Ritter, and Zhao (1996)). I find that these direct costs are an order of magnitude too small to account for the impact of raising more financing on firm value. Second, I interpret as fixed costs the opportunity cost of managers focusing on raising financing rather than on running operations. Using a fixed costs proxy that I construct, I find that firms that have higher fixed costs raise more financing. I then use my fixed costs proxy to test whether firms with higher

fixed costs and that raise more financing are worth more. I find some evidence that supports the fixed costs of raising financing explanation.

Third, the market timing explanation states that if firms can raise financing at prices above fundamental value, they should raise as much financing as possible and as soon as possible. Firms going public may be overvalued because of excessively low expected returns and/or excessively high expected cash flows. If this overvaluation is corrected within a few years, then, in the years after going public, firms that time the market should have lower realized returns relative to the appropriate benchmark, reflecting upward revisions of expected returns and/or downward revisions of expected cash flows (for example, see Ritter (1991) and Baker and Wurgler (2002)). They may also have lower realized cash flows relative to expected cash flows. To test the market timing explanation, I test whether raising more financing is associated with worse stock performance and lower than expected earnings. I find no evidence that supports the market timing explanation.

I perform several additional robustness tests of the results. First, I may be finding that firms that raise more financing are worth more because both financing and firm value are mismeasured and contain investment opportunities and/or firm quality. I consider this possibility by examining secondary share sales for which my three hypotheses are just as applicable as for primary share sales but which may be unaffected by measurement error. Using secondary share sales, I find the same results as I do using primary share sales, thus my results do not appear to be driven by measurement error. Second, I find the same results regardless of whether the overallotment option is exercised, thus my results are not the mechanical result of the underwriter exercising the overallotment option (and increasing the financing raised by the firm) when the firm is worth more in the aftermarket than at the offering. I also find the same results

regardless of whether the firm goes public during a hot issues market versus other periods. Finally, I find the same results regardless of whether the firm receives a positive or a negative valuation shock, which alleviates some concerns about reverse causality.

Overall, the evidence most strongly supports the investor recognition explanation of why firms that raise more financing are worth more, namely, that raising more financing leads to greater investor recognition and thereby increases firm value. The rest of this paper is organized as follows. Section 2 describes the data. Section 3 examines the relationship between raising more financing and firm value. Section 4 considers potential explanations for this relationship. Section 5 presents the results of robustness tests. Section 6 concludes.

## **2. Data**

I construct my sample of IPO firms by extracting all IPOs between 1980 and 2004 from Securities Data Company's New Issues database (10,715 firms). I retain only firms that can be matched to CRSP and that have CRSP listing dates sometime within thirty-one days of the SDC IPO date (leaves 9,835 firms). I retain only publicly traded U.S. operating firms, defined as firms with CRSP share codes of 10 or 11 (8,136 firms). I exclude financial and utility firms, defined as having CRSP SIC codes of 6000-6999 and 4900-4949, respectively (leaves 7,151 firms). Finally, I retain only firms that have net assets at the fiscal year end before the IPO of at least five million real dollars (leaves 4,582 firms).

I construct the sample of firms that I use in my model of normal cash holdings as follows. From Compustat, I obtain all firm-years such that the fiscal year end is between 1980 and 2005 (298,268 firm-years). I retain only firm-years that are matched to CRSP. I split these firm-years into two groups, namely, firm-years for which the fiscal year end is more than five years after the CRSP listing date (leaves 115,108 firm-years corresponding to seasoned firms) and firm-years

for which the fiscal year end is on or after the CRSP listing date but on or before five years after the CRSP listing date (leaves 65,515 firm-years corresponding to IPO firms). For IPO firms, I retain only firms that do an IPO between 1980 and 2004 according to SDC and that can be matched to CRSP (leaves 38,892 firm-years). Next, for both groups, I retain only publicly traded U.S. operating firms (leaves 94,651 and 31,814 firm-years corresponding to seasoned firms and IPO firms, respectively) and I exclude financial and utility firms (leaves 74,297 and 28,339 firm-years, respectively). Finally, for seasoned firms, I retain only firm-years for which net assets are at least five million real dollars (leaves 69,674 firm-years and 8,371 firms). For IPO firms, I retain only firms that have net assets at the fiscal year end before the CRSP listing date of at least five million real dollars (leaves 18,739 firm-years and 4,578 firms).

From CRSP, I obtain stock returns, stock prices, shares outstanding, trading volume, share codes, SIC codes, listing dates, delisting dates, and returns on the CRSP equally weighted and value weighted indices. Trading volume for NASDAQ firms is available beginning in November 1982. I obtain monthly factor returns from Ken French's website. I obtain purged monthly factor returns from Jay Ritter's website. Purged factor returns are only available until December 2003.

From Compustat, I obtain cash (item #1), current assets (item #4), current liabilities (item #5), total assets (item #6), long-term debt due in more than a year (item #9), sales (item #12), EBITDA (item #13), common stock dividends (item #21), common shares outstanding at the fiscal year end (item #25), deferred taxes and investment tax credits (item #35), long-term debt due within a year (item #44), R&D expenditures (item #46), book value of common equity (item #60), capital expenditures (item #128), acquisitions expenditures (item #129), and stock prices at the fiscal year end (item #199).

From SDC's New Issues database, for each IPO I obtain the IPO date, the offer price (i.e., the final prospectus price), the midpoint of the original filing range (i.e., the preliminary prospectus price), the number of primary shares sold in the offering, the number of secondary shares sold in the offering, the number of shares sold from the exercise of the overallotment option, the gross spread, the name(s) of the underwriter(s), the number of lead and co-managing underwriters, whether the firm is venture capital backed, and a breakdown of the expenses of the offering. A breakdown of the expenses of the offering are only available from 1991 to 2001. From Jay Ritter's website, I obtain the Carter and Manaster (1990) underwriter rankings for the lead underwriters of my IPO firms (covers IPOs from 1980 to 2004), a monthly time series of the total number of IPOs, and a monthly time series of the mean initial returns on IPOs.

From I/B/E/S, for the last day of each month, which I call the "summary date", for each firm, I compute analyst coverage as follows. I begin with the earnings estimates detail file and retain only estimates that are for the next fiscal year end. Estimates in the detail file only begin in 1983. I then keep only estimates with fiscal year end dates that fall within one year after the summary date. I then keep only estimates with fiscal year end dates equal to the first fiscal year end date after the summary date, i.e., the earliest fiscal year end date within one year after the summary date. Then, for each broker covering the firm, I keep the latest estimate, i.e., the estimate with an estimate date closest to but on or before the summary date. For the remaining estimates, one per firm-broker, I count the number of brokers covering the firm. I/B/E/S earnings estimates are available beginning in 1983.

From Thomson's 13f filings data, I obtain a list of all institutions owning every firm every calendar quarter. I keep only publicly traded U.S. operating firms. I then count the total number of institutions each quarter as well as the number of institutions owning each firm.

Throughout the paper, all real amounts are in December 2004 dollars. All winsorized variables are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentiles unless otherwise stated. Event years +1 through +5 refer to years one through five years after the IPO date.

### **3. Raising More Financing and Firm Value**

I first examine how raising more financing is associated with firm value. By financing, I mean financing raised for reasons other than the standard transactions and precautionary motives for holding cash. To estimate this "excess financing", I compute the difference between actual cash holdings after the IPO and expected cash holdings estimated from a model of cash holdings as used by Opler, Pinkowitz, Stulz, and Williamson (1999), Dittmar and Mahrt-Smith (2007), and Bates, Kahle, and Stulz (2007). To account for the transactions motive, I control for firm size and cash substitutes, and to account for the precautionary motive, I control for investment, cash flows, cash flow risk, and investment opportunities.

I use here my sample of 88,413 firm-years between 1980 and 2005 for 8,371 seasoned and 4,582 IPO firms selected as described in the previous section. I define cash holdings as  $\ln(\text{CASH/NA})$  because it does not suffer from the right-skewness of CASH/NA (Opler, Pinkowitz, Stulz, and Williamson (1999), Dittmar and Mahrt-Smith (2007), and Foley, Hartzell, Titman, and Twite (2007) do likewise). Net assets (NA) are total assets net of cash. My explanatory variables are as follows:

- $\ln(\text{NA})$ :  $\ln(\text{real net assets})$ , a measure of size
- CAPEX/NA, R&D/NA, and ACQN/NA: All measures of investment
- EBITDA/NA: A measure of cash flows
- Industry median SD(EBITDA/NA): A measure of cash flow risk. Within each industry based on two-digit SIC codes, for each year, for each publicly traded U.S. operating firm,

I compute EBITDA/NA for the current year and each of the last nine fiscal years. As long as there are at least five of ten observations for a firm-year, I compute the standard deviation of EBITDA/NA, and I use the median standard deviation in that industry that year.

- NWC/NA: A measure of cash substitutes. Net working capital is computed as current assets minus current liabilities minus cash.
- B/M: A proxy for investment opportunities, computed as book value of common equity plus deferred taxes and investment tax credits all divided by market capitalization of equity at the fiscal year end.
- LTD/NA: Leverage, computed as long-term debt due in more than a year plus long-term debt due within a year
- Pays dividends dummy: A measure of firm maturity

I also include calendar year dummy variables to capture any year to year changes in macroeconomic conditions. Some firms may consistently have low or high cash holdings, so I control for this with firm fixed effects. All variables other than dummy variables are winsorized.

My empirical implementation is complicated by the possibility that cash holdings and investment opportunities may be endogenously determined. Accordingly, I follow Dittmar and Mahrt-Smith (2007) and I run two-stage regressions, instrumenting for book-to-market in the first stage with industry book-to-market and including all other variables from the second stage as well.<sup>1</sup> Within each industry based on two-digit SIC codes, for each year, for each publicly traded U.S. operating firm, I compute the median book-to-market ratio.

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<sup>1</sup> If I instrument with industry median sales growth rather than industry median market-to-book, the results of the paper are the same.

[Insert Table 1 about here]

Table 1 presents the results both without and with firm fixed effects. Bigger firms, firms that spend more on acquisitions, firms with more cash substitutes, and firms with higher leverage hold less cash. Firms with greater capital expenditures, firms with greater R&D expenditures, firms with greater cash flows, firms with more cash flows, firms with more investment opportunities, and firms that pay dividends hold more cash. These results are consistent with the results in the literature.

For my estimate of excess financing, I use the residuals of the second stage regression with firm fixed effects in Table 1,  $X\ln(\text{CASH/NA})$ , measured in year +1. These residuals also include the estimated firm fixed effects, i.e., I do not include consistently low or high cash holdings in a firm's normal cash holdings but rather in its excess cash holdings.<sup>2</sup> Like Bates, Kahle, and Stulz (2007), I find that firms going public have positive excess cash holdings on average but this effect becomes economically insignificant within a few years after the IPO.<sup>3</sup> However, my focus is not the level of cash holdings but rather how raising more financing is associated with firm value.

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<sup>2</sup> I use alternative estimates in untabulated results. In one alternative, I measure cash holdings scaled by total assets or sales rather than net assets. In another alternative, I control for industry in my model of normal cash holdings using two-digit SIC codes. In yet another alternative, I estimate excess cash holdings on my sample of IPO firms and excluding seasoned firms. In a final alternative, I use the residuals of a simple model of  $\ln(\text{CASH/NA})$  explained by  $\ln(\text{NA})$ . Regardless of which alternative I use, the results of the paper are the same.

<sup>3</sup> Firms that raise more financing because it leads to greater investor recognition and thereby increases firm value should hold more cash even five years after going public. Were these firms to return their excess cash to investors via a share repurchase, they would reverse the liquidity caused by raising more financing.

To measure firm value, I take the comparable firm multiples approach that is standard in both the academic literature and among practitioners (for example, see Kim and Ritter (1999), Purnanandam and Swaminathan (2004), and Houston, James, and Karceski (2006)). I match each IPO firm to a comparable seasoned firm and compute relative valuation ratios. I find a matched firm for each IPO firm as follows. For each IPO firm, for each of years +1 through +5, I consider as candidate match firms all Compustat firms that can be matched to CRSP, that have fiscal year end dates within the event year, that have been listed for at least five calendar years at the time of their fiscal year end date, that do not delist before the IPO date, that are publicly traded U.S. operating firms, and that have the same two-digit SIC code as the IPO firm. I select as the matched firm the candidate firm with the closest net assets to the IPO firm. By matching every IPO firm, for every event year, I ensure that there is always a matched firm that is most similar to the IPO firm that year.<sup>4</sup> An IPO firm may have as many as six different matched firms.<sup>5</sup>

I then compute relative valuation ratios. Specifically, for each of years +1 through +5, I first compute the ratio of net market capitalization to net assets for each IPO firm and its matched firm, where net market capitalization is market capitalization of equity net of cash. I then take the natural logarithm of the ratio of IPO firm's multiple to its matched firm's multiple,  $\ln((ME/NA)_{IPO}/(ME/NA)_{match})$ . I compute valuation ratios using not only net assets in the

<sup>4</sup> If I match only at the fiscal year end before the IPO date, the results of the paper are the same.

<sup>5</sup> As an alternative, I select matched firms based on additional dimensions, such as investment and cash flows, or on alternative measures of size, such as total assets or sales. I also match seasoned firms to IPO firms using propensity score matching. Specifically, for each of years +1 through +5, I compute propensity scores for my sample IPO firms and seasoned firms using size, investment, and cash flows. I then match each IPO firm to the seasoned firm in the same year with the same two-digit SIC code and with the closest propensity score. The results of the paper are the same.

denominator but also total assets, sales, and EBITDA. In the case of EBITDA, I only use observations where both the IPO firm and its matched firm have positive EBITDA. Similarly, I compute valuation ratios using not only market capitalization of equity in the numerator but also market capitalization of equity plus book value of debt.

[Insert Figure 1 about here]

Figure 1 is illustrative only but it does show that raising more financing is associated with higher firm value and that this relationship persists for many years after the IPO. Results using the other relative valuation ratios instead of net market capitalization of equity-to-net assets are similar and thus not shown. Using simple regressions of relative valuation ratios on excess cash, I find that raising 100% more financing at the IPO is associated with 29.0%, 21.6%, 18.2%, 18.1%, and 17.4% higher valuations in years +1 through +5. Pre-IPO shareholders choose the price and quantity of the financing that they raise. Conditional upon going public, do pre-IPO shareholders choose price and quantity to maximize the net benefit of going public?

To answer this question, I perform a simple analysis of what the valuation premium must be for pre-IPO shareholders to be willing to bear the costs of raising more financing. I assume that the choice of the offer price per share,  $P_o$ , and quantity of shares,  $N \times \alpha$ , where  $N$  is the number of shares outstanding after the IPO and  $\alpha$  is the fraction of post-IPO firm sold to investors in the IPO, affects the market price per share after the IPO,  $P_m = P_m(P_o, N \times \alpha)$ . The dollar benefit of raising more financing is  $N \times (1 - \alpha) \times P_m \times (P_m/P_b - 1)$  and it is driven by the valuation premium,  $P_m/P_b$ , where  $P_b$  is the price per share if the firm does not raise more financing. Pre-IPO shareholders receive this benefit only on the shares they retain after the IPO. The dollar cost of raising more financing is  $N \times \alpha \times P_m \times [(P_o/P_m) \times S + 1 - (P_o/P_m)]$ , where  $S$  is the gross spread paid to

the underwriter and  $1-(P_o/P_m)$  is the underpricing. Pre-IPO shareholders are optimizing if  $P_m/P_b - 1 = [(P_o/P_m) \times S + 1 - (P_o/P_m)] \times [\alpha/(1-\alpha)]$ .

To calibrate the valuation premium at the optimum, I consider different parameter values of  $P_o/P_m$ , the ratio of the offer price per share to the market price per share, and  $\alpha$ , the fraction of the post-IPO firm sold to investors in the IPO. I set  $S=0.07$  for simplicity since the gross spread is 7% for the majority of IPO firms. Table 2 presents the valuation premium for different parameter values of  $P_o/P_m$  and  $\alpha$  that roughly correspond to the bottom, middle, and top quartiles of the empirical distribution of these parameters. The results suggest that the valuation premium should be around 5-15%, depending on the cost of selling shares and the number of shares sold. This is comparable to the impact of raising more financing on firm value that I have documented, which is consistent with pre-IPO shareholders choosing price and quantity to maximize the net benefit of going public. In the next section, I consider potential explanations for why firms that raise more financing are worth more.

#### **4. Potential Explanations**

##### *4.1 The investor recognition explanation*

I hypothesize that raising more financing leads to greater investor recognition and thereby increases firm value.<sup>6</sup> This argument assumes that information is costly. If this is the case, then it follows that not all investors follow all firms all the time, i.e., investor recognition differs across firms and across time. In turn, a firm's stock price in a costly information world will be lower

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<sup>6</sup> If the demand curve for shares in the firm slopes downward, shifting the supply curve out by selling more shares would decrease the price per share. Only if the demand curve shifts out to more than compensate for the decrease in price would the equilibrium effect on firm value of selling more shares be positive. If the demand curve is flat, then for the equilibrium effect on firm value of selling more shares to be positive the demand curve would simply have to shift up. Empirically, I only examine the equilibrium effect.

than in a costless information world, and the difference will be smaller the less costly information is to investors. For investors in the IPO, the benefits of incurring these information costs include more efficient risk sharing, more informative stock market prices, and greater liquidity. If the benefits are not sufficiently large, a particular investor in the IPO may not be willing to incur these information costs unless other investors in the IPO also do likewise. For pre-IPO shareholders, the benefits of greater investor recognition are lower expected returns and/or higher expected cash flows. If the net benefit of greater investor recognition is sufficiently large, pre-IPO shareholders may be willing to bear some or all of the information costs instead of investors in the IPO by giving them a quantity of underpriced shares. In this way, raising more financing leads to greater investor recognition and thereby increases firm value.<sup>7</sup>

To test this investor recognition explanation, I first test whether raising more financing is associated with greater investor recognition, and then I test whether the investor recognition caused by raising more financing is associated with higher firm value.<sup>8</sup> To test whether raising

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<sup>7</sup> Thus investor recognition, which is driven by information costs required for investment decisions, differs from consumer recognition, which is driven by information costs required for consumption decisions, although the two would appear to be related.

<sup>8</sup> I would expect the results of the latter test to be consistent with the numerous empirical tests of the impact of investor recognition on firm value. Arbel, Carvell, and Streb (1983) document that firms with greater institutional ownership have lower returns, which is consistent with greater investor recognition decreasing the cost of capital. Bodnaruk and Östberg (2007) document the same result for all investors' shareholdings using Swedish data. Chung and Jo (1996) find that greater analyst coverage is associated with higher firm value. Kadlec and McConnell (1994) find that graduating from NASDAQ to the NYSE is associated with higher firm value, and Foerster and Karolyi (1999) and Miller (1999) find likewise for cross-listing in the U.S. Amihud, Mendelson, and Uno (1999) find that firms that intervene to relax minimum transaction size constraints experience an increase in firm value. Chaplinsky

more financing is associated with greater investor recognition, I run regressions of investor recognition on excess financing, excess underpricing, and determinants of investor recognition. I account for excess underpricing because underpricing more can also lead to greater investor recognition (see Chemmanur (1993), Aggarwal, Krigman, and Womack (2002), and Cliff and Denis (2004)). I account for excess underpricing rather than underpricing itself because there are numerous reasons for underpricing that are unrelated to investor recognition. For example, greater underpricing may compensate IPO investors for the valuation uncertainty they bear by purchasing shares at the IPO rather than in the aftermarket.<sup>9</sup>

The persistence of the impact of raising more financing on firm value allows me to distinguish between a rational and a behavioral interpretation of the role of investor recognition. If raising more financing leads to greater investor recognition and thereby increases firm value to above fundamental value, and if this overvaluation is corrected within a few years, then the impact of raising more financing on firm value should also dissipate within a few years. However, if the impact is persistent, this is consistent with greater investor recognition playing a rational role in increasing firm value. Thus I examine to what extent the impact is persistent.

I consider three groups of proxies for investor recognition, namely, proxies for underwriting services, liquidity, and investor interest. My proxies for underwriting services are underwriter reputation and the size of the underwriting team. For underwriter reputation, I use a dummy variable for whether the lead underwriter has a Carter and Manaster (1990) rank of at

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and Ramchand (2000) find for seasoned equity issuers that firm value is higher when the firm's potential investor base is broader.

<sup>9</sup> Similarly, Booth and Chua (1996) argue that pre-IPO shareholders may be willing to increase underpricing to bear some or all of the information costs of investors in the IPO. This increases ownership dispersion and thereby increases liquidity, decreases expected returns, and increases firm value.

least eight (for firms with multiple lead underwriters, I use the average rank of the lead underwriters). This underwriter rank is a standard proxy for reputation in the IPO literature.<sup>10</sup> For the size of the underwriting team, I use the number of lead and co-managing underwriters. More underwriters can provide better underwriting services because they have more extensive marketing capabilities, a wider distribution network, etc.

I use two proxies for liquidity. The first proxy is the natural logarithm of the mean daily ratio of absolute stock returns to the dollar value of trading volume (in millions of dollars) during the year after the IPO. This proxy is from Amihud (2002) and it measures price impact, that is, the cost in stock returns of trading a million dollars worth of stock. The second proxy is the percent of zero volume trading days during the year after the IPO. This proxy is from Lesmond, Ogden, and Trzcinka (1999) and it should be interpreted as a measure of illiquidity. The proportion of my sample firms that trade every day rises from roughly half in year +1 to roughly two-thirds in year +5. I avoid proxies that use the magnitude of trading volume because trading volume is reported differently for NASDAQ, a dealer market, and the NYSE and AMEX, both auction markets, although the difference varies across firms and across time (see Atkins and Dyl (1997)).

I use two proxies for investor interest. On the assumption that firms with greater investor recognition should have more analyst coverage and broader ownership, I use analyst coverage and breadth of ownership. I measure analyst coverage one year after the IPO because analyst

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<sup>10</sup> In this paper, better underwriting services lead to greater investor recognition. The literature has also examined underwriting services in other contexts such as the formation of underwriting syndicates to reduce moral hazard in team production (Pichler and Wilhelm (2001)), the role of information production in underwriting syndicates (Corwin and Schultz (2005)), and the association of firms and underwriters by mutual choice (Fernando, Gatchev, and Spindt (2005)).

coverage tends to build gradually during the year after the IPO and then levels off, and I wish to use an equilibrium coverage value. I measure breadth of ownership one year after the IPO as the number of institutions that own a given stock divided by the total number of institutions owning stocks in publicly traded U.S. operating firms. Analyst coverage is a good rough proxy for investor interest. Breadth of ownership has the advantage of capturing the fraction of investors that own the stock, thus providing a lower bound on investor awareness of the firm, but it ignores the investors who are aware of the firm but do not own stock in it.

For my estimate of excess financing, I use the same  $X\ln(CASH/NA)$  as before. For my estimate of excess underpricing, I need a benchmark for initial returns. Hence I estimate a model of normal initial returns for my IPO firms. I follow Bradley and Jordan (2002) in estimating my model of normal initial returns. The Appendix provides details on my estimate of excess initial returns,  $X\ln(1+IR)$ .<sup>11</sup>

For the determinants of my investor recognition proxies, I follow the literature. For liquidity, analyst coverage, and breadth of ownership, I follow Chordia, Huh, and Subrahmanyam (2007), Chung and Jo (1996), and Grullon, Kanatas, and Weston (2004), respectively. The main factors used in these papers are size, investment opportunities, profitability, and risk. These factors would also seem to be among the main determinants of underwriting services, though I am not aware of any comprehensive empirical paper in this area. To capture these factors, I use  $\ln(NA)$ , CAPEX/NA, R&D/NA, ACQN/NA, EBITDA/NA, industry SD(EBITDA/NA), and industry B/M at the fiscal year end before the IPO.

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<sup>11</sup> In principle, as costs of increasing investor recognition, raising more financing and underpricing more may be either substitutes or complements. In practice, they are complements. In untabulated results, I find that a one percent change in initial returns (excess initial returns) is associated with a one (three) percent change in cash-to-net assets (excess cash-to-net assets).

I also attempt to account for measurement error in financing and firm value. If both financing and firm value are measured with error, then they may be correlated simply because they both contain some omitted factors. As a solution to this potential problem, I attempt to control for two omitted factors that are particularly important, investment opportunities and firm quality. To proxy for investment opportunities, I use venture capital backing and offer price revisions. To proxy for firm quality, I also use venture capital backing and offer price revisions as well as managerial ownership retention.

The logic behind venture capital backing is that venture capitalists tend to invest in firms in industries with greater investment opportunities, so venture capital backing can proxy for greater investment opportunities. Similarly, insofar as venture capital backed firms are staffed by highly skilled professional managers (for example, see Hellmann and Puri (2002)), these firms tend to be higher quality firms. The logic behind offer price revisions is driven by information production by investors about the firm during bookbuilding. Insofar as information produced about the firm's investment opportunities and quality is reflected in the offer price revision, offer price revisions can proxy for these omitted factors.<sup>12</sup> The logic behind using managerial ownership retention after the IPO is twofold. Managers can signal firm quality, at the cost of not diversifying their personal wealth, by retaining a larger ownership stake in the firm (see Leland and Pyle (1977)). Similarly, managers with a larger ownership stake in the firm have a greater incentive to maximize firm value (see Jensen and Meckling (1976)), so higher managerial

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<sup>12</sup> Proceeds revisions are inappropriate because they depend on the scale of the firm's projects. For example, if the scale of the firm's projects is fixed, then if information produced is favorable, price increases but quantity decreases such that proceeds stay the same. Looking at proceeds revisions fails to show the favorable information produced.

ownership retention can proxy for consequently higher firm quality.<sup>13</sup> I measure venture capital backing using a venture capital backing dummy variable, I measure offer price revisions using the change in the offer price between the original and final prospectuses, which I winsorize, and I measure managerial ownership retention as the fraction of the firm not sold in the IPO.

[Insert Table 3 about here]

I run probit regressions for the reputable underwriter dummy, negative binomial regressions for the number of underwriters and the number of analysts, and ordinary least squares regressions for price impact, zero volume trading days, and breadth of ownership. Table 3 present the results for underwriting services, liquidity, and investor interest in the year after the IPO. The regression results indicate that both raising more financing and underpricing more are associated with greater investor recognition. For example, a one-standard deviation increase in excess cash is associated with a 54.3% increase in the probability of having a reputable underwriter, a 49.7% decrease in price impact, and a 5.3% increase in the number of analysts. For excess initial returns, the corresponding figures are 11.6%, 45.7%, and 3.1%, respectively, impressive though somewhat smaller in magnitude than for excess cash.<sup>14</sup> The results for the determinants of my investor recognition proxies are generally statistically significant and of the correct sign. Bigger firms, firms with greater investment opportunities, more risky firms, and higher quality firms have greater investor recognition.

The results are consistent with the literature on investor recognition. For example, Grullon, Kanatas, and Weston (2004) find that a one-standard deviation increase in advertising

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<sup>13</sup> Moreck, Shleifer, and Vishny (1988) find that firm value is not monotonically increasing in managerial ownership. For this reason, I replace the fraction of managerial ownership retained with dummy variables for the quartile of managerial ownership retained. The results of the paper are the same.

<sup>14</sup> If I use initial returns rather than excess initial returns, the results of the paper are the same.

expenditures is associated with an 18.3% decrease in relative price impact and an 11.9% increase in the number of institutional shareholders. This is comparable to my finding that a one-standard deviation increase in excess cash is associated with a 49.7% decrease in price impact and a 19.8% increase in the breadth of ownership. Although their estimates are somewhat smaller in magnitude than mine, their sample also comprises much bigger firms than mine.

[Insert Table 4 about here]

Table 4 presents the results for liquidity and investor interest in years +1 through +5 with the regression specification otherwise the same as in Table 3 (including the explanatory variables being measured at the same point in time as in Table 3). For expositional simplicity, I only tabulate the impacts on each investor recognition proxy of a one-standard deviation change in excess cash and excess initial returns scaled by the mean of the investor recognition proxy where appropriate.<sup>15</sup> Both excess cash and excess initial returns are statistically and economically significant even in year +5. However, the economic impact of excess cash at the IPO tends to be associated with the same impact on liquidity and investor interest in year +1 as in year +5 whereas the economic impact of excess initial returns gradually halves during the five years after the IPO. In other words, the impact of raising more financing on investor recognition persists for many years whereas the impact of underpricing more dissipates over time. I now test whether the investor recognition caused by raising more financing is associated with higher firm value.

Investor recognition and firm value may be endogenous. In other words, not only may greater investor recognition cause higher firm value, but higher firm value may cause greater investor recognition. In this case, I must control for investor recognition when explaining firm

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<sup>15</sup> Although my investor recognition proxies trend over time (for example, see Loughran and Ritter (2004)), the results are the same during various sub-periods.

value. I solve this potential endogeneity problem by running regressions of firm value on investor recognition decomposed by excess financing. The component of investor recognition correlated with excess financing allows me to answer my question of interest while the component of investor recognition uncorrelated with excess financing allows me to control for the effect of investor recognition on firm value. The coefficient estimate on the latter component is biased so I will not interpret it, but the coefficient estimate on the former component should be exogenous to firm value. There is no reason to believe that higher firm value causes firms to increase investor recognition by raising more financing. The same reasoning applies to excess underpricing, so I follow the same procedure for excess initial returns.

I use the same relative valuation ratios as before as well as the same investor recognition proxies. I am interested in the impact of my investor recognition proxies individually and collectively. However, the individual proxies are highly correlated (pairwise correlations have an average magnitude of 0.449 and are all statistically significant at the one percent level). Hence I create a composite investor recognition proxy as the first principal component of the individual proxies. The component loadings are 0.344, 0.397, -0.488, -0.297, 0.461, and 0.430, and they all have the correct sign.

I decompose each investor recognition proxy into two components, one correlated with excess cash and the other uncorrelated with excess cash. I regress the investor recognition proxy the year after the IPO on excess cash and I use the fitted values and the residuals as my estimates of the two components, respectively. I then run regressions of relative valuation ratios in years +1 through +5 on the two components of the decomposed investor recognition proxy. To compare the impact of excess cash and excess initial returns on relative valuation ratios, I follow the same procedure for excess initial returns. I also control for investment opportunities and firm

quality using the venture capital backing dummy variable, the offer price revision, and the fraction of managerial ownership retained as before.

[Insert Table 5 about here]

[Insert Table 6 about here]

Table 5 and Table 6 present the results for the composite investor recognition proxy and net market capitalization of equity-to-net assets as the relative valuation ratio. Results for the individual investor recognition proxies and for the other relative valuation ratios are similar and thus not tabulated. Table 5 reports complete regression results for the composite investor recognition proxy decomposed by excess cash. Table 6 does likewise for excess initial returns.

Panel As of the two tables show that more excess cash is associated with higher valuations in years +1 through +5 whereas higher excess initial returns are associated with higher valuations only until year +3. In terms of economic magnitude, a one-standard deviation increase in excess cash is associated with roughly 30% higher valuations in year +1, +25% in year +2, and +20% in years +3 through +5. By contrast, a one-standard deviation increase in excess initial returns is associated with roughly 25% higher valuations in year +1, +15% in year +2, and +5% in year +3.<sup>16</sup>

To simplify the interpretation of the results, I also run a set of regressions like in Table 5 and Table 6 but using both excess cash and excess initial returns simultaneously as the only two explanatory variables and without decomposition. I thus obtain estimates of the elasticity of

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<sup>16</sup> I use alternative specifications in untabulated results. In one alternative, I include simultaneously the component of investor recognition correlated with excess cash and the component of investor recognition correlated with excess initial returns but I omit the two uncorrelated components. In another alternative, I control for  $\ln(\text{NA})$ ,  $\text{CAPEX/NA}$ ,  $\text{R\&D/NA}$ ,  $\text{ACQN/NA}$ ,  $\text{EBITDA/NA}$ , industry  $\text{SD(EBITDA/NA)}$ , and industry  $B/M$ . In a final alternative, I control for the year in which the firm goes public. Regardless of which alternative I use, the results are the same.

relative valuation ratios with respect to excess cash and the elasticity of relative valuation ratios with respect to excess initial returns. In years +1 through +5, the elasticities with respect to excess cash are 0.261, 0.183, 0.155, 0.154, and 0.158, respectively. In years +1 through +3, the elasticities with respect to excess initial returns are 1.478, 0.827, and 0.372, respectively, and are not statistically significant in subsequent years. Therefore, raising 100% more financing, for example, is associated with 25% higher valuations in year +1, +18% in year +2, and roughly +15% in years +3 through +5.

To benchmark the magnitude of the impact of raising more financing on firm value, I consider the work of Fang and Peress (2007) on media coverage. They find that firms with no media coverage outperform firms with high media coverage by 0.23% per month (0.65% to 1% per month for small firms, firms with low analyst coverage, and firms owned primarily by individuals). Suppose a firm generates a fixed stream of perpetual cash flows and has an expected return of 13% per year. If media coverage increases from no coverage to high coverage and the expected return drops to 10%, then firm value increase by 30%. This is comparable to my estimates of the impact of raising more financing on firm value.

It is possible that all of the shares issued to raise excess financing are bought by a single blockholder and that the positive effect on firm value of the resulting increase in monitoring outweighs the negative effect of resulting decrease in managerial incentives. In the absence of data on blockholders, I cannot test this possibility directly but it seems unlikely given the findings of Field and Sheehan (2004). They find that there are blockholdings in place for most IPO firms before the IPO, that these blockholdings remain in place after the IPO, and that the formation of new blockholdings after the IPO is unrelated to underpricing. It seems more likely that the negative effect on firm value of decreased managerial incentives dominates, especially to

the extent that managers sell their shares following the expiration of lockups and venture capitalists sell their shares or distribute them to their investors.

A closely related explanation to the investor recognition explanation is signaling. A signaling equilibrium is possible where high quality firms raise more financing, low quality firms do not because it is prohibitively costly for them to do so, and investors value more highly firms that raise more financing. The predictions of the investor recognition and signaling explanations are similar and the empirical evidence is also generally consistent with both. Both explanations allow that share sales reduce the alignment of managers' and shareholders' interests but that share sales also have offsetting benefits. However, the signaling explanation requires that investors interpret selling more shares, including secondary shares, as a positive signal per se. The consensus in the academic and practitioner literature is to the contrary. In their survey of managers, Brau and Fawcett (2006) find that managers believe that selling a larger fraction of the firm and selling insider shares are viewed as negative signals by the market. Similarly, Killian, Smith, and Smith (2001) repeatedly warn investors about investing in firms going public where managers have too little skin in the game and/or are cashing out. Therefore, while both the investor recognition and signaling explanations are theoretically possible, the signaling explanation seems less plausible in practice.

In summary, the impact of raising more financing through investor recognition on firm value is economically significant and persists for many years. Moreover, that raising more financing has a persistent impact on firm value is consistent with greater investor recognition playing a rational role in increasing firm value. Overall, there is strong evidence for the investor recognition explanation of why firms that raise more financing are worth more.

#### *4.2 The fixed costs of raising financing explanation*

The fixed costs explanation states that if there is a fixed cost associated with raising financing, firms with relatively higher fixed costs should raise more financing but should do so less frequently. Otherwise, firm value is destroyed either because investment opportunities are lost if the firm does not raise financing again or because fixed costs are needlessly duplicated if the firm does raise financing again.<sup>17</sup> I test the fixed costs hypothesis using two interpretations of fixed costs. First, I interpret as fixed costs the direct costs of raising financing. I follow Lee, Lochhead, Ritter, and Zhao (1996) and I define these fixed costs to be the sum of accounting, legal, printing and engraving, S.E.C. and state registration, transfer and registrar agent, and trustee expenses. I then compute the ratio of these direct costs to market capitalization of equity at the close of the first day of trading. The median firm has direct costs of 0.47% of market capitalization, and the 75<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup> percentile of direct costs to market capitalization are 0.88%, 1.54%, and 2.12%, respectively. A glance at Figure 1 shows that these direct costs are simply too small by at least an order of magnitude to account for the impact of raising more financing on firm value.

Second, I interpret as fixed costs the opportunity cost of managers focusing on raising financing rather than on running operations. I test whether firm value is higher for firms with higher fixed costs of raising financing and that actually raise more financing. As before, I measure firm value using relative valuation ratios.

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<sup>17</sup> The relevant fixed costs are those that must be incurred when raising financing, i.e., both in the IPO and in an SEO. Accordingly, many fixed costs of the IPO are not relevant because they must be incurred only at the IPO (e.g., stock exchange registration expenses).

I construct a fixed costs proxy as follows. I consider several variables associated with fixed costs, i.e., with how costly it is for managers to focus on raising financing rather than on running operations. Managerial focus on running operations should be more important for smaller firms, for firms with high investment, less profitable firms, more risky firms, and firms with better investment opportunities. The corresponding variables are  $\ln(NA)$ , the sum of CAPEX/NA, R&D/NA, and ACQN/NA, EBITDA/NA, industry SD(EBITDA/NA), and industry B/M, respectively, at the fiscal year end before the IPO. I extract the first common factor of these variables and I use this as my fixed costs proxy. More accurately, I use the negative of the first common factor as my fixed costs proxy so that higher values of the fixed costs proxy correspond to higher fixed costs. The factor loadings are 0.119, -0.363, 0.285, -0.233, and 0.205, and they all have the correct sign. Consistent with firms with higher fixed costs raising more excess financing, the correlation between excess financing and my fixed costs proxy is 0.421 (p-value 0.000).

I run regressions of relative valuation ratios on excess financing, the interaction of excess financing and the fixed costs proxy, the fixed costs proxy, the venture capital backing dummy variable, the offer price revision, and the fraction of managerial ownership retained. If firms with higher fixed costs of raising financing actually raise more financing, then the interaction term should be positive. I also control for firm quality using the venture capital backing dummy variable, the offer price revision, and the fraction of managerial ownership retained as before.

[Insert Table 7 about here]

Table 7 presents the results for net market capitalization of equity-to-net assets as the relative valuation ratio. Results for the other relative valuation ratios are similar and thus not tabulated. More excess cash is associated with roughly 40% higher firm value in year +1 and between +20% and +30% in years +2 through +5. Moreover, the interaction term is positive in

each of years +1 through +5, though it is only statistically significant in years +1, +3, and +5. In year +1, the impact of excess cash on firm value is just 33.7% for firms with low fixed costs (at the 25<sup>th</sup> percentile of the fixed costs proxy) compared to 45.7% for firms with high fixed costs (at the 75<sup>th</sup> percentile). The results for years +2 through +5 are similar. In terms of the opportunity cost interpretation of the fixed costs of raising financing, there is some evidence that supports the fixed costs explanation of why firms that raise more financing are worth more.

#### *4.3 The market timing explanation*

The market timing explanation states that if firms can raise financing at prices above fundamental value, they should raise as much financing as possible and as soon as possible. Firms going public may be overvalued because of excessively low expected returns and/or excessively high expected cash flows. If this overvaluation is corrected within a few years, then in the years after going public firms that time the market should have lower realized returns relative to the appropriate benchmark, reflecting upward revisions of expected returns and/or downward revisions of expected cash flows. They may also have lower realized cash flows relative to expected cash flows. To test the market timing explanation, I test whether raising more financing is associated with worse stock performance and lower than expected earnings. I find no evidence that supports the market timing explanation.

Specifically, I first run calendar-month Fama-French three-factor regressions for a portfolio that is long firms with low excess cash and short firms with high excess cash. The portfolio contains all sample firms that have gone public in the last five years. Low (high) excess cash is defined as below (above) median excess cash for my sample IPO firms. Following Loughran and Ritter (2000), I run regressions with both unpurged factor returns as well as factor returns purged of all firms that have issued equity. Next, I run event-time regressions of buy-and-

hold abnormal returns on excess cash. Returns are computed for each firm for up to five years from the IPO date using as the benchmark the CRSP equally weighted index, the CRSP value weighted index, and portfolios matched by size quintile and book-to-market quintile.

Finally, I run regressions of earnings forecast errors on excess cash. Earnings forecasts errors are defined as realized earnings minus estimated earnings all divided by the stock price. Realized and estimated earnings are in per share terms. Estimated earnings are the mean of the earnings estimates for the next fiscal year provided by analysts covering the firm. I measure estimated earnings and the stock price at the end of each of years +1 through +5. I can only compute earnings forecast errors for firms that are covered by at least one analyst. I treat earnings forecast errors greater than 100% in absolute value as missing observations and I winsorized earnings forecast errors at the 2.5<sup>th</sup> and 97.5<sup>th</sup> percentiles.

[Insert Table 8 about here]

Table 8 presents the results. From the factor regressions in Panel A, we see that low excess financing firms underperform high excess financing firms by roughly 0.5% to 1.0% per month. In other words, raising more financing is not associated with lower realized returns. From the buy-and-hold abnormal returns regressions in Panel B, we see that excess cash is only statistically significant using the CRSP value weighted index. The results using the CRSP value weighted index suggest that raising more financing is associated with better stock performance. From Panel C, we see that excess cash is associated with higher earnings forecast errors. In other words, firms that raise more financing have higher than expected cash flows, which is inconsistent with the market timing explanation. In summary, the evidence does not support the market timing explanation of why firms that raise more financing are worth more.

The results of the tests of the market timing explanation help differentiate between the investor recognition and market timing explanations. Lower expected returns would be consistent with both explanations provided that cash flow expectations were unbiased. Table 3 and Table 4 show that raising more financing is associated with greater liquidity. If greater liquidity decreases expected returns, then firms that raise more financing should have lower expected returns. The result that realized returns are not lower for firms that raise more financing is not evidence against either explanation because cash flows may be underestimated. However, underestimated cash flows would be consistent only with the investor recognition explanation and not with the market timing explanation since the market timing explanation would predict overestimated cash flows (or certainly not underestimated cash flows). In fact, cash flows are underestimated. Therefore, while the realized returns results in Table 8 can be interpreted as inconclusive about whether expected returns are lower for firms that raise more financing, the underestimated cash flows results are clearly inconsistent with the market timing explanation.<sup>18</sup>

## **5. Robustness Tests**

I perform several additional robustness tests of the results. First, I may be finding that firms that raise more financing are worth more because both financing and firm value are mismeasured and contain investment opportunities and/or firm quality. I consider this possibility by examining secondary share sales in the IPO. Secondary share sales transfer ownership from pre-IPO shareholders to IPO investors and do not provide financing to the firm. However, for the purposes of the three explanations, selling secondary shares works in exactly the same way as

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<sup>18</sup> I am admittedly agnostic about whether cash flows should be underestimated for firms that raise more financing. However, I would expect that if firms raise more financing to "buy" biased analyst estimates, they would pay for overly optimistic analyst estimates.

does selling primary shares, thus the impact on firm value should also be the same.<sup>19</sup> Additionally, unlike sales of primary shares, sales of secondary shares may even be associated with lower investment opportunities and lower firm quality. Firms presumably first sell primary shares to finance investment opportunities and only then sell secondary shares to allow pre-IPO shareholders to reduce their stake in the firm. Thus secondary share sales may indicate that a firm has sufficient financing for its investment opportunities. Similarly, selling secondary shares necessarily reduces the alignment of managers' and shareholders' interests and thus decreases firm quality by exacerbating agency problems.

I redo the results of Table 3 through Table 8 using only firms that sell at least some secondary shares (roughly two-fifths of my sample firms). I use secondary share sales instead of excess cash, where I measure secondary share sales as the natural logarithm of the ratio of the dollar value of secondary share sales at the offer price net of the gross spread to net assets in year +1. Using secondary share sales, I find the same results as I do using primary share sales, both qualitatively and quantitatively, thus the results do not appear to be driven by measurement error.

Second, I consider whether the results are driven by the sale of shares from the exercise of overallotment options. Underwriters receive an overallotment option from the issuer that allows them to purchase up to 15% of the shares sold in the offering. The underwriter typically oversells the offering by 15% and pursues one of two strategies to cover the resulting short position. If the stock price in the aftermarket is greater than or equal to the offer price, then the underwriter exercises the overallotment option and earns the gross spread on the additional 15%

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<sup>19</sup> If shares are sold, be they primary or secondary shares, and managers do not buy any shares, then the alignment of managers' and shareholders' interests is reduced, which will work against observing in equilibrium a positive relationship between financing and firm value.

of the shares it oversold. If the stock price is less than the offer price, then the underwriter purchases shares in the aftermarket and profits on the difference between the proceeds of the sale to investors and the cost of purchasing shares in the market.

Consequently, the relationship between raising more financing and firm value may be a mechanical result of underwriters pursuing their optimal short covering strategy. Since the underwriter exercises the overallotment option if and only if the stock price in the aftermarket is greater than or equal to the offer price, then firms that are worth more in the aftermarket also raise more financing. I classify my sample firms into two sub-samples based on whether the overallotment option is exercised, and I redo the results of Table 3 through Table 8 to examine whether the results differ between the two sub-samples. The overallotment option is exercised for roughly two-thirds of my sample firms. I find that the results are the same within each sub-sample, thus the results do not appear to be driven by the sale of shares from the exercise of overallotment options.

Third, I consider whether the results are simply a manifestation of Alti (2006)'s hot issues markets finding. Hot issues markets are periods during which a relatively high number of firms go public and are periods of high stock prices. One interpretation of hot issues markets is that they are periods of low asymmetric information, which leads to lower expected returns and thereby leads to both higher firm value and more financing raised (for example, see Bayless and Chaplinsky (1996) and Choe, Masulis, and Nanda (1993)). Alti (2006) studies initial public offerings that occur during hot issues markets versus other periods and finds that firms issue more equity during hot issues markets. Hence the relationship between raising more financing and firm value may be driven by firms going public during hot issues markets versus other periods.

I classify my sample firms into two sub-samples based on whether the firm goes public during a hot issues market or not. I follow Alti (2006) and I define hot issues markets as periods when the three-month centered moving average of the total number of IPOs from Jay Ritter's website is above its median value between 1980 and 2004. Roughly three-quarters of my sample firms go public during hot issues markets. I redo the results of Table 3 through Table 8 to examine whether the results differ between the two sub-samples. I find that the results are the same within each sub-sample, thus the results do not appear to be driven by hot issues markets.<sup>20</sup>

Finally, I consider whether the causality from raising more financing to firm value runs in the opposite direction. Ritter (1984) observes that to raise a given amount of financing, a firm that is more highly valued has to sell a smaller fraction of the firm to IPO investors. In other words, if a firm receives a positive valuation shock, both the fraction sold in the IPO and the entire firm are worth more. The firm is not worth more because it raises more financing.

While I cannot observe valuation shocks before the firm files to go public, I can observe valuation shocks between the filing date and the offering date. For firms for which this latter valuation shock is negative, the total valuation shock (including before the filing date) is smaller and raising more financing should have a smaller impact on firm value. I classify my sample firms into two sub-samples based on whether the final offer price is below the bottom of the original filing range. As a result of this classification, roughly one-quarter of my sample firms have a negative valuation shock (roughly 25% in magnitude) between the filing date and the offering date. I redo the results of Table 3 through Table 8 to examine whether the results differ

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<sup>20</sup> The difficulty with defining excess financing as financing adjusted for whether the firm goes public during a hot issues market is that market conditions do not explain much of financing. A dummy variable for hot issues markets explains roughly 0.5% of each of Alti (2006)'s ratios of proceeds to total assets.

between the two sub-samples, and I find that the results are the same within each sub-sample. While this does not allow me to rule out reverse causality completely, it does allow the possibility that raising more financing leads to higher firm value.

## **6. Conclusion**

I study the financing decisions of firms going public, and I find that firms that raise more financing are worth more. I then study why this is the case. As one potential explanation, I consider the investor recognition hypothesis, which states that raising more financing leads to greater investor recognition and thereby increases firm value. Using several proxies for investor recognition, I find that raising more financing is associated with greater investor recognition, and that the investor recognition caused by raising more financing is associated with higher firm value. I also consider two other potential explanations for why firms that raise more financing are worth more. I find some evidence that supports the fixed costs of raising financing explanation but no evidence that supports the market timing explanation. The results do not appear to be driven by investment opportunities or firm quality. Overall, the evidence most strongly supports the investor recognition explanation of why firms that raise more financing are worth more.

Indeed, the investor recognition explanation provides a reason why firms sell so many shares at so high a cost when they go public. In the limit, if pre-IPO shareholders minimize costs by only selling a few shares in the IPO, investors in the IPO may not find it optimal to bear information costs themselves, and no market in the firm's shares develops. The firm in effect simply defers going public and the associated costs to a later time.

## Appendix

I follow Bradley and Jordan (2002) in estimating my model of normal initial returns. I define initial returns as  $\ln(P_{\text{market}}/P_{\text{offer}})$ , winsorized at the 2.5<sup>th</sup> and 97.5<sup>th</sup> percentiles, and denote them as  $\ln(1+IR)$ . My explanatory variables are as follows. I control for the well-known partial adjustment phenomenon documented by Hanley (1993), namely, that the offer price is only partially adjusted to reflect information learned between the original and final prospectuses, using  $P_{\text{offer}}/P_{\text{filing}}-1$ , which I winsorize. I use the mean initial returns of IPOs in the last three months to measure what other firms pay in underpricing costs. I also include  $\ln(NA)$ , CAPEX/NA, R&D/NA, ACQN/NA, EBITDA/NA, industry SD(EBITDA/NA), industry B/M, LTD/NA, and the pays dividends dummy variable all at the fiscal year end before the IPO. These variables should adequately account for size, investment opportunities, profitability, risk, leverage, and firm maturity.<sup>1</sup>

[Insert Appendix Table 1 about here]

Appendix Table 1 presents the results. Firms with greater price revisions and firms going public when initial returns are typically high have higher initial returns. Bigger firms, more profitable firms, and more levered firms have lower initial returns. Firms with greater investment opportunities and more risky firms have higher initial returns. These results are consistent with the literature.

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<sup>1</sup> Unlike Bradley and Jordan (2002), however, I do not include overhang (more accurately, managerial ownership retained) and venture capital backing because I use them as proxies for firm quality. I also do not include underwriter reputation because I use excess underpricing to explain underwriting services of which underwriter reputation is a proxy. The results of the paper are the same if I do include overhang and/or the venture capital backing dummy variable.

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**Table 1**  
**Model of Normal Cash Holdings**

This table presents the estimates of a model of normal cash holdings. The sample comprises a panel of 88,413 firm-years consisting of 8,371 seasoned firms and 4,582 IPO firms between 1980 and 2005. The regression equation is:

$$\begin{aligned} \ln\left(\frac{CASH_{i,t}}{NA_{i,t}}\right) = & \beta_0 + \beta_1 \ln(NA_{i,t}) + \beta_2 \frac{CAPEX_{i,t}}{NA_{i,t}} + \beta_3 \frac{R \& D_{i,t}}{NA_{i,t}} + \beta_4 \frac{ACQN_{i,t}}{NA_{i,t}} + \beta_5 \frac{EBITDA_{i,t}}{NA_{i,t}} + \\ & + \beta_6 \text{Industry SD}(EBITDA / NA)_{i,t} + \beta_7 \frac{NWC_{i,t}}{NA_{i,t}} + \beta_8 \text{Instrumented}\left(\frac{B_{i,t}}{M_{i,t}}\right) + \beta_9 \frac{LTD_{i,t}}{NA_{i,t}} + \\ & + \text{Pays dividends dummy} + \text{Year dummies} + \text{Firm dummies} + \varepsilon_{i,t}. \end{aligned}$$

NA = net assets. ACQN = acquisitions expenditures. Industry SD(EBITDA/NA) is the industry (based on two-digit SIC codes) median standard deviation of EBITDA/NA. NWC = current assets minus current liabilities minus cash. Industry B/M is the industry (based on two-digit SIC codes) median B/M. LTD = long-term debt due in more than a year plus long-term debt-due within a year. In the second stage of two-stage regressions, I use instrumented book-to-market from the first stage. All regressions include year dummies. In the set of regressions with firm fixed effects, standard errors are clustered by firm. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Below each coefficient estimate is its corresponding robust t-statistic in parentheses.

	Without firm fixed effects		With firm fixed effects	
	First stage	Second stage	First stage	Second stage
			B/M	ln(CASH/NA)
ln(NA)	-0.011*** (3.77)	-0.163*** (21.95)	0.103*** (30.58)	-0.441*** (56.62)
CAPEX/NA	-0.580*** (13.08)	0.929*** (6.99)	-0.760*** (24.67)	0.878*** (12.55)
R&D/NA	-0.834*** (27.38)	4.021*** (38.70)	-0.164*** (5.14)	1.774*** (27.86)
ACQN/NA	-0.355*** (10.43)	-0.548*** (5.60)	-0.338*** (11.01)	-0.238*** (3.80)
EBITDA/NA	-0.509*** (26.37)	0.969*** (15.37)	-0.564*** (45.17)	0.934*** (27.80)
Industry SD(EBITDA/NA)	0.443*** (3.72)	3.998*** (12.92)	0.651*** (7.33)	1.458*** (8.27)
NWC/NA	0.313*** (15.34)	-0.564*** (10.51)	0.508*** (39.21)	-0.200*** (6.22)
Industry B/M	0.838*** (33.43)		0.745*** (51.63)	
Instrumented B/M		-0.552*** (8.77)		-0.173*** (4.51)
LTD/NA	-0.290*** (12.07)	-1.372*** (24.89)	-0.384*** (30.52)	-0.255*** (8.83)
Pays dividends dummy	-0.033*** (3.23)	0.018 (0.63)	-0.046*** (6.23)	0.151*** (10.24)
Constant	0.600*** (17.98)	-1.505*** (14.55)	-0.012 (0.91)	-0.657*** (13.63)
Number of firm-years	87,060	87,374	87,060	87,374
Adjusted R <sup>2</sup>	0.198	0.318		
Within firms R <sup>2</sup>			0.157	0.124
Between firms R <sup>2</sup>			0.152	0.220
Overall R <sup>2</sup>			0.121	0.179

**Table 2**  
**Calibration of Valuation Premium**

This table presents the valuation premium for different parameter values of  $P_o/P_m$  and  $\alpha$ . The valuation premium is  $P_m/P_b - 1 = [(P_o/P_m) \times S + 1 - (P_o/P_m)] \times [\alpha/(1-\alpha)]$ .  $P_o/P_m$  is the ratio of the offer price per share to the market price per share and  $\alpha$  is the fraction of the firm sold to investors in the IPO. The sample comprises 4,582 firms that go public between 1980 and 2004.

		$\alpha$ , the fraction of the firm sold to investors in the IPO		
		20%	30%	40%
$P_o/P_m$ , the ratio of the offer price per share to the market price per share	80%	6.4%	11.0%	17.1%
	90%	4.1%	7.0%	10.9%
	100%	1.8%	3.0%	4.7%

**Table 3**  
**Short-Term Impact of Raising More Financing and Underpricing More on Investor Recognition**

This table presents regressions of investor recognition at the IPO on excess financing and excess underpricing at the IPO. The sample comprises 4,582 firms that go public between 1980 and 2004. The regression equation is:

$$\begin{aligned} \text{Investor recognition}_i = & \beta_0 + \beta_1 X \ln \left( \frac{\text{CASH}}{NA} \right)_i + \beta_2 X \ln(1 + IR)_i + \beta_3 \ln(NA_i) + \beta_4 \frac{\text{CAPEX}_i}{NA_i} + \beta_5 \frac{R \& D_i}{NA_i} + \beta_6 \frac{\text{ACQN}_i}{NA_i} + \beta_7 \frac{\text{EBITDA}_i}{NA_i} + \\ & + \beta_8 \text{Industry SD}(EBITDA / NA)_i + \beta_9 \text{Industry} \left( \frac{B}{M} \right)_i + \\ & \beta_{10} \text{Venture capital dummy}_i + \beta_{11} \text{Offer price revision}_i + \beta_{12} \text{Managerial ownership}_i + \varepsilon_i. \end{aligned}$$

Probit regressions are run for the reputable underwriter dummy, negative binomial regressions for the number of underwriters and the number of analysts, and ordinary least squares regressions for price impact, zero volume trading days, and breadth of ownership. The reputable underwriter dummy is a dummy variable for whether the lead underwriter has a Carter and Manaster (1990) rank of at least eight. The number of underwriters is the number of lead and co-managing underwriters. Price impact is the mean daily ratio of absolute stock returns to dollar trading volume (in millions of dollars). Breadth of ownership is the number of institutions that own a given stock divided by the total number of institutions owning stocks in publicly traded U.S. operating firms. Price impact and the percent of zero volume trading days are measured during the year after the IPO. The number of analysts and the breadth of ownership are measured one year after the IPO. NA = net assets. ACQN = acquisitions expenditures. Industry SD(EBITDA/NA) is the industry (based on two-digit SIC codes) median standard deviation of EBITDA/NA. NWC = current assets minus current liabilities minus cash. Industry B/M is the industry (based on two-digit SIC codes) median B/M.  $\ln(NA)$ , CAPEX/NA, R&D/NA, ACQN/NA, EBITDA/NA, industry SD(EBITDA/NA), and industry B/M are from the fiscal year end before the IPO. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Below each coefficient estimate is its corresponding robust t-statistic in parentheses.

Panel A: Regressions of investor recognition proxies on excess financing and excess underpricing

	Underwriting services		Liquidity		Investor interest	
	Reputable underwriter dummy	Number of underwriters	ln(price impact)	Percent of zero volume trading days	Number of analysts	Percent breadth of ownership
Xln(CASH/NA)	0.210*** (12.00)	0.060*** (11.40)	-0.307*** (18.05)	-0.619*** (8.94)	0.119*** (13.47)	0.267*** (10.77)
Xln(1+IR)	0.517*** (3.31)	0.212*** (4.40)	-3.240*** (17.87)	-4.687*** (7.56)	0.810*** (9.60)	1.785*** (8.89)
ln(NA)	0.697*** (29.19)	0.196*** (27.96)	-0.791*** (47.94)	-1.103*** (15.32)	0.314*** (36.33)	0.917*** (18.76)
CAPEX/NA	0.634*** (3.54)	0.137** (2.26)	-1.014*** (5.62)	-1.941*** (2.74)	0.549*** (6.35)	0.865*** (3.75)
R&D/NA	1.221*** (9.41)	0.215*** (7.03)	-1.436*** (11.76)	-1.904*** (6.15)	0.387*** (7.69)	1.633*** (10.87)
ACQN/NA	-0.025 (0.11)	0.170*** (2.81)	-0.057 (0.31)	-0.381 (0.57)	-0.060 (0.60)	-0.620*** (2.59)
EBITDA/NA	0.093* (1.65)	-0.077*** (3.76)	-0.145** (2.12)	-0.565*** (3.65)	0.031 (1.03)	0.454*** (5.70)
Industry SD(EBITDA/NA)	1.709* (1.93)	1.713*** (6.13)	-4.828*** (5.84)	-10.692*** (3.71)	2.915*** (7.31)	3.366*** (2.68)
Industry B/M	-0.619*** (4.48)	-0.477*** (10.18)	0.661*** (4.87)	2.535*** (3.80)	-0.103 (1.37)	0.172 (0.86)
Venture capital backed dummy	0.465*** (9.09)	0.097*** (6.76)	-0.269*** (5.41)	-0.668*** (3.31)	0.290*** (11.72)	0.443*** (6.99)
Offer price revision	0.666*** (5.39)	0.163*** (4.91)	-3.113*** (23.60)	-2.808*** (6.19)	0.715*** (11.57)	2.266*** (12.95)
Managerial ownership retained	-0.006 (0.04)	-0.185*** (3.87)	0.203 (1.62)	0.142 (0.28)	0.003 (0.05)	-0.033 (0.16)
Constant	-2.450*** (14.48)	0.180*** (3.19)	-0.532*** (3.51)	7.286*** (11.21)	-0.499*** (6.19)	-2.142*** (7.37)
Observations	4,426	4,426	4,305	4,246	4,192	4,381
Pseudo R <sup>2</sup>	0.291	0.082			0.100	
Adjusted R <sup>2</sup>			0.515	0.131		0.352

Panel B: Impact of excess financing and excess underpricing on investor recognition proxies

	Underwriting services		Liquidity		Investor interest	
	Reputable underwriter dummy	Number of underwriters	ln(price impact)	Percent of zero volume trading days	Number of analysts	Percent breadth of ownership
	$\frac{\hat{\beta}_{X_i} \times \hat{\sigma}_{X_i}}{\hat{\mu}_Y}$	$\frac{\hat{\beta}_{X_i} \times \hat{\sigma}_{X_i}}{\hat{\mu}_Y}$	$\hat{\beta}_{X_i} \times \hat{\sigma}_{X_i}$	$\frac{\hat{\beta}_{X_i} \times \hat{\sigma}_{X_i}}{\hat{\mu}_Y}$	$\frac{\hat{\beta}_{X_i} \times \hat{\sigma}_{X_i}}{\hat{\mu}_Y}$	$\frac{\hat{\beta}_{X_i} \times \hat{\sigma}_{X_i}}{\hat{\mu}_Y}$
Xln(CASH/NA)	54.8%	4.1%	-49.7%	-39.5%	5.3%	19.8%
Xln(1+IR)	11.8%	1.3%	-45.7%	-26.1%	3.1%	11.5%

**Table 4**  
**Long-Term Impact of Raising More Financing and Underpricing More on Investor Recognition**

This table presents Table 3 regressions with two exceptions. First, the only investor recognition proxies used are price impact, zero volume trading days, the number of analysts, and the breadth of ownership. Second, results for investor recognition are presented for each of the five years after the IPO rather than just the year after the IPO. For expositional simplicity, only impacts are tabulated.

Change in the investor recognition proxy from a one-standard deviation change in excess cash and excess initial returns									
	Year relative to the IPO date								
	+1	+2	+3	+4	+5				
<b>ln(price impact)</b>									
Xln(CASH/NA)	-49.7% ***	-54.9% ***	-56.3% ***	-59.7% ***	-57.8% ***				
Xln(1+IR)	-45.7% ***	-35.8% ***	-24.1% ***	-22.4% ***	-21.1% ***				
Percent of zero volume trading days, relative to its mean									
Xln(CASH/NA)	-39.5% ***	-43.9% ***	-42.7% ***	-47.9% ***	-48.8% ***				
Xln(1+IR)	-26.1% ***	-25.0% ***	-19.6% ***	-12.1% ***	-13.5% ***				
Number of analysts, relative to its mean									
Xln(CASH/NA)	5.3% ***	3.7% ***	3.6% ***	3.4% ***	3.0% ***				
Xln(1+IR)	3.1% ***	2.5% ***	2.0% ***	1.6% ***	1.5% ***				
Percent breadth of ownership, relative to its mean									
Xln(CASH/NA)	19.8% ***	18.1% ***	18.3% ***	18.7% ***	18.7% ***				
Xln(1+IR)	11.5% ***	7.9% ***	6.4% ***	4.8% ***	3.8% ***				

**Table 5**  
**Investor Recognition Decomposed By Financing and Firm Value**

This table presents regressions of firm value on investor recognition decomposed by excess financing. The sample comprises 4,582 firms that go public between 1980 and 2004. The regression equation is:

$$\ln\left(\frac{(ME_i/NA_i)_{IPO}}{(ME_i/NA_i)_{match}}\right) = \beta_0 + \beta_1 \text{Fitted investor recognition}_i + \beta_2 \text{Residual investor recognition}_i + \\ + \beta_3 \text{Venture capital dummy}_i + \beta_4 \text{Offer price revision}_i + \beta_5 \text{Managerial ownership}_i + \varepsilon_i.$$

The composite investor recognition proxy is first regressed on  $\ln(CASH/NA)$  and both the fitted values and residuals of this first regression are used in place of the composite investor recognition proxy in the second regressions. Regressions are run for each year relative to the IPO date. Seasoned firms are matched to IPO firms by industry and net assets. A composite investor recognition proxy is created as the first principal component of the six individual investor recognition proxies. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Below each coefficient estimate is its corresponding robust t-statistic in parentheses.

Panel A: Regressions of firm value on investor recognition decomposed by excess financing					
	Year relative to the IPO date				
	+1	+2	+3	+4	+5
Component of investor recognition proxy correlated with $\ln(CASH/NA)$	0.473*** (11.27)	0.364*** (8.15)	0.328*** (6.79)	0.258*** (4.96)	0.316*** (5.28)
Component of investor recognition proxy uncorrelated with $\ln(CASH/NA)$	0.091*** (6.04)	0.089*** (5.77)	0.062*** (3.90)	0.007 (0.41)	0.010 (0.52)
Venture capital backed dummy	0.206*** (4.16)	0.217*** (4.18)	0.169*** (2.98)	0.305*** (4.99)	0.144** (2.10)
Offer price revision	1.141*** (7.93)	0.581*** (3.82)	0.268 (1.62)	0.396** (2.34)	0.074 (0.41)
Managerial ownership retained	1.102*** (8.29)	0.517*** (3.93)	0.728*** (4.93)	0.807*** (5.04)	0.776*** (4.04)
Constant	0.148 (1.64)	0.055 (0.62)	-0.283*** (2.88)	-0.430*** (3.95)	-0.421*** (3.21)
Observations	4,053	3,757	3,231	2,810	2,487
Adjusted R <sup>2</sup>	0.136	0.067	0.045	0.048	0.031

Panel B: Impact of investor recognition caused by excess financing on firm value					
	Year relative to the IPO date				
	+1	+2	+3	+4	+5
Change in relative valuation ratio from a one-s.d. increase in the investor recognition proxy correlated with excess cash	33.9%	24.8%	22.1%	16.9%	20.8%

**Table 6**  
**Investor Recognition Decomposed By Underpricing and Firm Value**

This table presents regressions of firm value on investor recognition decomposed by excess underpricing. The sample comprises 4,582 firms that go public between 1980 and 2004. The regression equation is:

$$\ln\left(\frac{(ME_i/NA_i)_{IPO}}{(ME_i/NA_i)_{match}}\right) = \beta_0 + \beta_1 \text{Fitted investor recognition}_i + \beta_2 \text{Residual investor recognition}_i + \\ + \beta_3 \text{Venture capital dummy}_i + \beta_4 \text{Offer price revision}_i + \beta_5 \text{Managerial ownership}_i + \varepsilon_i.$$

The composite investor recognition proxy is first regressed on  $X\ln(1+IR)$  and both the fitted values and residuals of this first regression are used in place of the composite investor recognition proxy in the second regressions. Regressions are run for each year relative to the IPO date. Seasoned firms are matched to IPO firms by industry and net assets. A composite investor recognition proxy is created as the first principal component of the six individual investor recognition proxies. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Below each coefficient estimate is its corresponding robust t-statistic in parentheses.

Panel A: Regressions of firm value on investor recognition decomposed by excess underpricing

	Year relative to the IPO date				
	+1	+2	+3	+4	+5
Component of investor recognition proxy correlated with $X\ln(1+IR)$	0.718*** (8.22)	0.411*** (4.51)	0.186* (1.93)	-0.034 (0.32)	-0.095 (0.88)
Component of investor recognition proxy uncorrelated with $X\ln(1+IR)$	0.103*** (7.01)	0.099*** (6.47)	0.079*** (5.00)	0.034** (2.04)	0.038** (2.01)
Venture capital backed dummy	0.318*** (6.45)	0.282*** (5.46)	0.228*** (4.03)	0.339*** (5.64)	0.214*** (3.17)
Offer price revision	1.413*** (10.20)	0.819*** (5.49)	0.472*** (2.90)	0.555*** (3.29)	0.241 (1.35)
Managerial ownership retained	1.132*** (8.49)	0.583*** (4.38)	0.778*** (5.24)	0.870*** (5.58)	0.887*** (4.63)
Constant	0.081 (0.91)	-0.020 (0.23)	-0.345*** (3.54)	-0.488*** (4.68)	-0.528*** (4.08)
Observations	3,999	3,710	3,193	2,778	2,459
Adjusted R <sup>2</sup>	0.133	0.063	0.037	0.040	0.021

Panel B: Impact of investor recognition caused by excess underpricing on firm value

	Year relative to the IPO date				
	+1	+2	+3	+4	+5
Change in relative valuation ratio from a one-s.d. increase in the investor recognition proxy correlated with excess initial returns	25.0%	13.3%	5.8%	-1.0%	-2.8%

**Table 7**  
**Test of the Fixed Costs Explanation**

This table presents a test of the fixed costs explanation of why firms that raise more financing are worth more. The sample comprises 4,582 firms that go public between 1980 and 2004. The regression equation is:

$$\ln\left(\frac{(ME_i/NA_i)_{IPO}}{(ME_i/NA_i)_{match}}\right) = \beta_0 + \beta_1 X \ln\left(\frac{CASH}{NA}\right)_i + \beta_2 X \ln\left(\frac{CASH}{NA}\right)_i \times \text{Fixed costs}_i + \beta_3 \text{Fixed costs}_i + \\ + \beta_4 \text{Venture capital dummy}_i + \beta_5 \text{Offer price revision}_i + \beta_6 \text{Managerial ownership}_i + \varepsilon_i.$$

Regressions are run for each year relative to the IPO date. Seasoned firms are matched to IPO firms by industry and net assets. The fixed costs proxy is created as the first common factor of  $\ln(NA)$ , the sum of CAPEX/NA, R&D/NA, and ACQN/NA, EBITDA/NA, industry SD(EBITDA/NA), and industry B/M. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Below each coefficient estimate is its corresponding robust t-statistic in parentheses. † indicates no statistically significant difference from conditioning on the fixed costs proxy.

Panel A: Regressions of relative valuation ratios on excess financing conditional on fixed costs

	Year relative to the IPO date				
	+1	+2	+3	+4	+5
Xln(CASH/NA)	0.165*** (8.53)	0.124*** (6.33)	0.141*** (6.60)	0.097*** (4.32)	0.142*** (5.49)
Xln(CASH/NA) × Fixed costs proxy	0.039 (1.27)	-0.012 (0.44)	0.063** (2.09)	0.034 (1.09)	0.092*** (2.86)
Fixed costs proxy	0.046 (0.78)	-0.014 (0.28)	-0.179*** (3.14)	0.039 (0.65)	-0.091 (1.37)
Venture capital backed dummy	0.206*** (4.11)	0.290*** (5.39)	0.236*** (4.10)	0.249*** (4.05)	0.141** (2.03)
Offer price revision	1.261*** (8.98)	0.843*** (5.71)	0.426*** (2.68)	0.371** (2.32)	0.058 (0.33)
Managerial ownership retained	1.011*** (7.77)	0.532*** (4.04)	0.747*** (5.12)	0.727*** (4.81)	0.762*** (4.03)
Constant	0.140 (1.54)	-0.015 (0.16)	-0.412*** (4.04)	-0.403*** (3.78)	-0.511*** (3.86)
Observations	4,226	3,887	3,362	2,936	2,600
Adjusted R <sup>2</sup>	0.131	0.060	0.044	0.049	0.036

Panel B: Impact of excess financing on relative valuation ratios

	Change in relative valuation ratio from a one-standard deviation change in excess cash conditional on fixed costs proxy				
Fixed costs proxy is equal to its ...	Year relative to the IPO date				
	+1	+2	+3	+4	+5
... 25 <sup>th</sup> percentile	26.4%	23.1%	18.5%	13.2%	15.3%
... Mean	30.6%	21.9%	24.6%	16.2%	23.7%
... 75 <sup>th</sup> percentile	33.0%	21.3%	28.2%	18.0%	28.9%

**Table 8**  
**Tests of the Market Timing Explanation**

This table presents tests of the market timing explanation of why firms that raise more financing are worth more. The sample comprises 4,582 firms that go public between 1980 and 2004. Panel A presents calendar-month Fama-French three-factor regressions for a portfolio that is long firms with low excess cash and short firms with high excess cash. The portfolio contains all sample firms that have gone public in the last five years. Low (high) excess cash are defined as below (above) median excess cash for my sample IPO firms. Panel B presents regressions of buy-and-hold abnormal returns on excess cash. Panel C presents a regression of earnings forecast errors on excess cash. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Below each coefficient estimate is its corresponding robust t-statistic in parentheses.

Panel A: Three-factor regressions with a portfolio long low excess financing firms and short high excess financing firms				
	$R_p - R_f$			
	Equally weighted portfolios		Value weighted portfolios	
	Unpurged factors	Purged factors	Unpurged factors	Purged factors
$R_m - R_f$	-0.222*** (3.09)	-0.286*** (3.61)	-0.190** (2.48)	-0.272*** (3.19)
SMB	-0.226*** (3.05)	-0.243** (2.28)	-0.075 (0.71)	-0.057 (0.39)
HML	0.730*** (8.08)	0.739*** (7.13)	0.800*** (6.19)	0.721*** (5.00)
Constant	-0.967*** (4.87)	-1.005*** (4.37)	-0.754*** (3.08)	-0.599** (2.12)
Observations	321	285	321	285
Adjusted R <sup>2</sup>	0.465	0.407	0.352	0.281

Panel B: Regressions of buy-and-hold abnormal returns for up to five years after the IPO on excess financing				
	$R_i - R_b$			
	$R_b = CRSP$ equally weighted index	$R_b = CRSP$ value weighted index	$R_b = Portfolios$ matched by size quintile and book-to-market quintile	
Xln(CASH/NA)	-1.395 (0.65)	5.248** (2.45)		-1.991 (0.94)
Constant	-24.964*** (5.66)	-35.633*** (8.09)		-11.493*** (2.68)
Observations	4,497	4,497		4,497
Adjusted R <sup>2</sup>	0.000	0.001		0.000

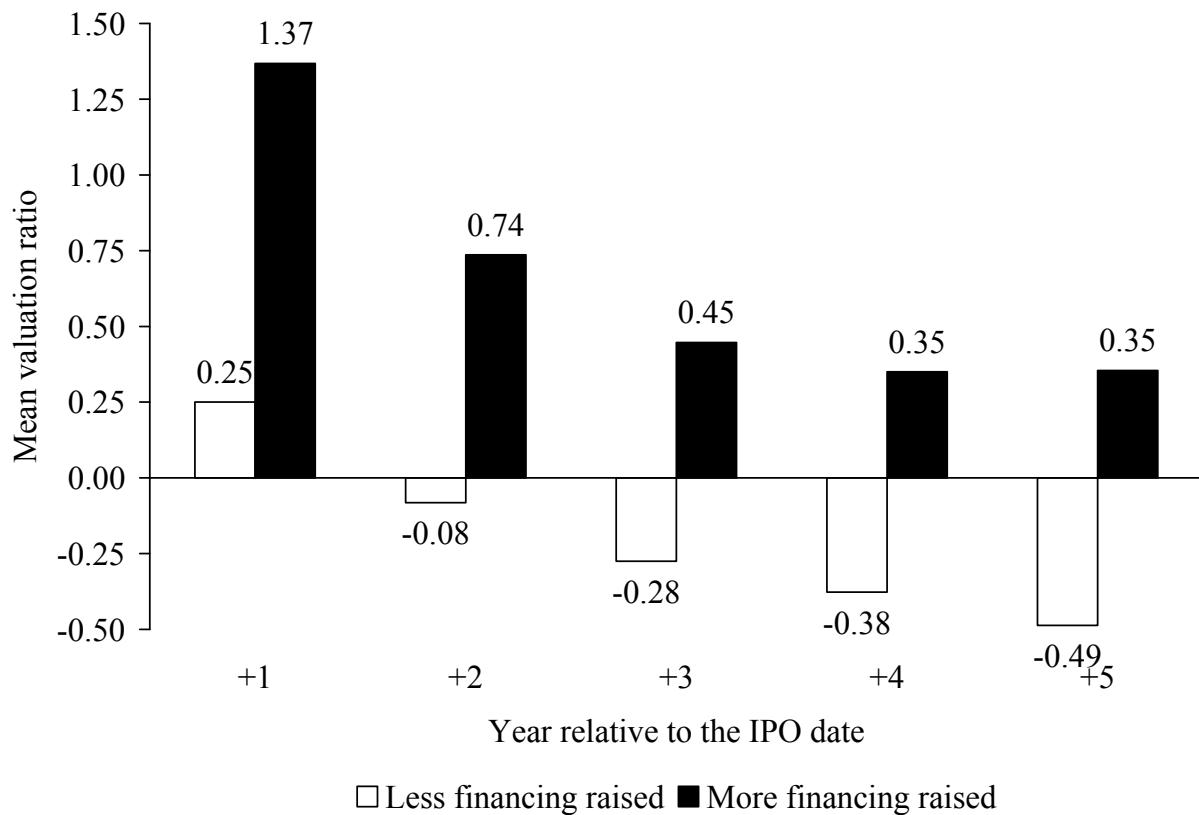
  

Panel C: Regression of earnings forecast errors on excess financing					
	100×(Realized earnings-Expected earnings)/Price				
	Year relative to the IPO date				
	+1	+2	+3	+4	+5
Xln(CASH/NA)	0.424*** (5.46)	0.445*** (3.92)	0.295** (2.40)	0.280** (2.10)	0.432*** (2.84)
Constant	-3.167*** (23.98)	-4.294*** (23.56)	-4.415*** (22.53)	-4.339*** (20.19)	-4.048*** (16.88)
Observations	3,251	2,921	2,490	2,135	1,720
Adjusted R <sup>2</sup>	0.010	0.006	0.002	0.002	0.005

**Appendix Table 1**  
**Model of Normal Initial Returns**

This table presents the estimates of a model of normal initial returns. The sample comprises 4,582 firms that go public between 1980 and 2004.  $\ln(1+\text{initial return}) = \ln(P_{\text{market}}/P_{\text{offer}})$ . Offer price revision =  $P_{\text{offer}}/P_{\text{filing}} - 1$ . NA = net assets. CAPEX = capital expenditures. R&D = R&D expenditures. ACQN = acquisitions expenditures. Industry SD(EBITDA/NA) is the industry (based on two-digit SIC codes) median standard deviation of EBITDA/NA. NWC = current assets minus current liabilities minus cash. Industry B/M is the industry (based on two-digit SIC codes) median B/M. LTD = long-term debt due in more than a year plus long-term debt-due within a year.  $\ln(\text{NA})$ , CAPEX/NA, R&D/NA, ACQN/NA, EBITDA/NA, industry SD(EBITDA/NA), industry B/M, LTD/NA, and the pays dividends dummy variable are from the fiscal year end before the IPO. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Below each coefficient estimate is its corresponding robust t-statistic in parentheses.

	ln(1+initial return)
Offer price revision	0.509*** (37.57)
Mean initial returns of IPOs in last three months	0.002*** (10.40)
$\ln(\text{NA})$	-0.011*** (7.11)
CAPEX/NA	0.045** (2.54)
R&D/NA	0.005 (0.37)
ACQN/NA	0.017 (0.89)
EBITDA/NA	-0.032*** (4.29)
Industry SD(EBITDA/NA)	0.236*** (2.99)
Industry B/M	-0.049*** (3.96)
LTD/NA	-0.018** (2.28)
Pays dividends dummy	-0.004 (0.67)
Constant	0.138*** (10.36)
Observations	4,432
Adjusted $R^2$	0.471



**Figure 1. Firm value by financing raised.** Firm value is measured by the valuation ratio  $\ln(ME/NA)$ . ME = market capitalization of equity net of cash. NA = total assets net of cash. Less and more financing raised are defined as below and above median excess financing for my sample IPO firms. Excess financing is actual cash holdings less normal cash holdings estimated in Table 1.