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Institutional versus Individual Investment in IPOs: The Importance of Firm Fundamentals

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Abstract

Consistent with institutions having an advantage over individuals, we find that newly public firms with the highest levels of institutional investment significantly outperform those with the lowest levels. While prior literature has attributed much of institutions' higher returns around various corporate events to private information, we find that much of the difference simply reflects better interpretation of readily available public information. Individuals disproportionately invest in the types of firms that earn significantly lower abnormal returns over the long run. Individuals either disregard or misinterpret the relevance of readily available public information, and as a result, they bear the brunt of IPO underperformance.

I. Introduction

Investing in initial public offerings (IPOs) can be an especially risky proposition. These are typically young companies, many with short operating histories and/or negative earnings as they go public. Not surprisingly, there is substantial variation in the stock performance of these firms, and the rewards for correctly identifying the best IPO firms ex ante are substantial. Over the 1980–2000 period, the top 100 IPOs earned over 1,000% in their first three years of trading, compared to −99% for the bottom 100 IPOs. Notably, substantial return differences are also seen over much shorter intervals. Over a three-month period after the IPO (not including the initial return), the top 100 IPOs earned an average of 182%, compared to −75% for the bottom 100.

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In this paper, we examine the investments of institutional investors within this class of firms characterized by high information asymmetry and substantial dispersion in returns. Institutional investors are widely regarded as being sophisticated (e.g., Nagel (2005), Cohen, Gompers, and Vuolteenaho (2002), Badrinath, Kale, and Noe (1995), and Michaely and Shaw (1994)), and with respect to IPOs, there are reasons to expect them to have particular advantages over individual investors. Institutions have connections to venture capitalists and underwriters, and they are invited to road shows where they can obtain firm- and offer-specific information. From the *San Francisco Chronicle* (August 19, 2004, p. C-1): "In a typical road show, large clients of the lead underwriters are invited to lunch at fancy hotels, where the company going public spills beans that weren't included in the prospectus. This supposedly gives the large investors an edge over the poor schmoes who weren't invited."

Consistent with Dor (2004), we find that newly public firms with larger institutional shareholdings perform better over several horizons than those with low institutional interest.[1] Over a one-year period following the IPO, returns on those firms in the highest institutional holdings quintile are 13.2% higher than those in the lowest institutional holdings quintile. Although firms with the highest institutional ownership significantly outperform those with the lowest institutional ownership, we find no evidence that the high institutional ownership firms experience significantly positive abnormal returns. Rather, we find that the source of the performance differential between high versus low institutional ownership firms is the abysmal performance of those firms with low institutional investment.

These findings raise the question: how are institutional investors able to identify and thereby avoid the worst performers ex ante? Chemmanur, He, and Hu (2005) suggest that institutions have private information, which enables them to earn superior returns around seasoned equity offerings (SEOs), and Chemmanur and Hu's (2007) findings suggest that institutions successfully employ private information to identify IPOs that earn above-average returns in the first few months after the offering. Chen, Harford, and Li (2007) conclude that a subset of institutions is able to achieve superior returns around mergers as a result of active monitoring. Boehmer, Boehmer, and Fishe (2006) find that institutions' ability to obtain better allocations in IPOs, combined with some private information after the IPO, enables them to outperform market benchmarks.

All of these explanations inherently posit that institutions outperform individuals because of some unique advantage that only institutions have, for example, private information, the ability to monitor, etc. These papers suggest that individuals suffer worse returns because they are not on an equal playing field with institutions. The implication is that individuals cannot hope to match the performance of institutions.

However, it is also possible that at least a portion of institutions' superior performance simply reflects the fact that they are more proficient than individual investors at using readily available public data. Odean (1998) finds that individuals systematically misinterpret information available to them, and he finds that

[1] This paper extends Field (1997).

over the months and years following their trades, the stocks individuals sell on average outperform those they buy. Barber and Odean (2008) find that individual investors disproportionately buy stocks that attract their attention, for example, stocks with large one-day returns and stocks in the news. This collective tendency to buy attention-grabbing stocks leads to poor subsequent returns. In contrast, the professional investors in their sample are significantly less likely to exhibit such tendencies.

Although the corporate events literature has attributed institutions' superior performance entirely to advantages that only they have (i.e., monitoring or private information), the research by Odean (1998) and Barber and Odean (2008) suggests an alternative explanation for institutions' superior returns. Based on this latter stream of literature, we hypothesize that the difference in returns between institutions and retail investors may simply reflect better use of readily available public information.

To examine the ways in which institutions and individuals use public information in their investment decisions, we examine the relation between institutional investment and several readily available measures of firm quality at the IPO, such as underwriter rank, earnings, leverage, and working capital. We find that a substantial portion of the variation in institutional investments across firms can be explained by simple public measures. Moreover, many of the readily available public measures of firm quality on which institutions base their investment decisions (and to which individuals similarly have access) are significantly related to future firm performance. For example, firms brought public by highly ranked underwriters perform significantly better following the IPO than those with low-ranked underwriters: Institutions invest disproportionately in offerings with highly ranked underwriters, while individuals invest disproportionately in those with low-ranked underwriters.

Our results provide no support for the idea that institutions' higher returns stem from a monitoring role. Prior literature suggests that certain types of institutions are more likely to actively monitor, for example, pension funds, dedicated investors (see, e.g., Bushee (2001)), and 5% blockholders. However, we find no evidence that firms with higher ownership by these groups outperform other firms. In fact, in many cases firms with higher ownership by these groups actually underperform other firms.

In sum, our results suggest that institutions utilize readily available public information to their advantage, while individuals appear to either underweight or misinterpret such information. Our findings are consistent with Odean's (1998) findings on the ways in which individuals versus professional investors use public information. While institutions do have a variety of advantages over individuals, such as access to private information and the ability to monitor, much of the advantage institutions possess simply reflects institutions "doing their homework," and individuals would benefit greatly by doing theirs.

The paper is organized as follows: Section II describes the data and methodology. Section III examines the relation between these institutional holdings and IPO long-run performance. Section IV focuses on the determinants of institutional investment and the extent to which these characteristics are related to post-IPO performance. In Section V, we consider the notion that the firms institutions

invest in earn higher returns because of institutional monitoring. In Section VI, we discuss the factors that potentially allow the long-run underperformance of certain classes of IPOs to persist for so long after the offering. Section VII concludes.

II. Data and Methodology

A. Sample Description

Our data set consists of firms that went public between 1980 and 2000, as listed on the Securities Data Company (SDC) database. We omit financial institutions (SIC codes 6000–6999), utilities (SIC codes 4900–4999), closed-end funds, American depositary receipts (ADRs), unit offerings, and IPOs with an offer price of less than five dollars. Firms are also required to have Center for Research in Security Prices (CRSP) data. Our final sample consists of 5,890 IPOs.

For each firm, we collect the offer date, offer price, initial file range, proceeds, underwriter name(s), whether the issue was backed by a venture capitalist, and the overallotment option (if available) from SDC. We use Carter and Manaster's (1990) measures of underwriter quality, as updated by Carter, Dark, and Singh (1998) and Loughran and Ritter (2004), to rank each underwriter. Ranks range from zero to nine, with higher ranks representing higher quality underwriters. We define the price run-up as the percentage difference between the offer price and the midpoint of the filing range, and we compute the initial return as the percentage difference between the first aftermarket closing price from CRSP and the offer price, where the aftermarket price must be within 14 days of the offer date. We also collect data on firm age at the time of the IPO, where age represents the number of years since the company was founded.[2]

Since 1978, the Securities and Exchange Commission (SEC) has required all institutions with more than $100 million of securities under discretionary management to report holdings of all common stock positions greater than 10,000 shares or $200,000 on a quarterly basis (at the end of March, June, September, and December).[3] We obtain these data on 13F institutional ownership from CDA/Spectrum for 1980–2000. Specifically, for each IPO firm, we obtain the total number of shares owned by each institution.

Because we are interested in voluntary post-IPO holdings by each institution (as opposed to initial allocations that institutions receive), we collect the institutional holdings at least one month after the IPO. Thus, for an IPO on February 21,

[2]Founding dates for 1980–1984 IPOs come from Jay Ritter's IPO database and are based on inspection of IPO prospectuses. Founding dates for 1985–1987 IPOs come from Moody's manuals and Dunn and Bradstreet's *Million Dollar Directory*. Founding dates for 1988–1992 IPOs come from inspection of the IPO prospectus and are used in Field and Karpoff (2002). Founding dates for 1993–1995 IPOs come primarily from proxy statements available on Lexis-Nexis, S&P Corporate Descriptions, and Moody's manuals. For 1996–2000 IPOs, founding dates come from SDC, Moody's manuals, Dunn and Bradstreet's *Million Dollar Directory*, the *IPO Reporter*, and inspection of IPO prospectuses available on Edgar (some of the prospectus data for 1996–2000 are from Ljungqvist and Wilhelm (2003)). See Appendix 1 of Loughran and Ritter (2004) for a complete description.

[3]It is not unusual for 13F institutions to report ownership levels that fall below the minimum reporting requirements. Of the 73,930 13F filings by institutions for our IPO sample, 8,337 (or 11%) of them hold fewer than 10,000 shares and an equity position of less than $200,000.

we collect institutional holdings as of the end of March. However, for an IPO on March 16, we collect institutional holdings as of the end of June. Ideally, we would also like to exclude institutions that owned shares prior to the IPO. Thus, we first omit any institution listed as a venture capitalist on VentureXpert. Second, we omit any institution that is listed as owning more than 15% of the shares offered in the IPO. This is based on the assumption that one entity is extremely unlikely to obtain such a large stake after the firm goes public, suggesting that it probably owned these shares prior to the IPO.

We define institutional ownership percentage as the number of shares owned by institutions divided by the estimated public float. For a recent IPO, the float should be approximately equal to the total number of shares offered in the IPO, which is equal to shares offered as listed in the prospectus plus the overallotment option.[4] In cases where sufficient data are available, this is the formula we use to obtain the float. Because SDC does not provide data on the overallotment option sold for all issues, in some cases we must estimate it. Based on Aggarwal's (2000) findings regarding the relation between the initial return and the size of the overallotment option, we assume that those issues with an initial return less than or equal to 5% have a float equal to 105% of shares offered. For those issues with an initial return greater than 5%, the float equals 115% of shares offered. Using these estimates, mean (median) institutional ownership as a percentage of the public float equals 25% (24%).[5]

Our finding of 25% average institutional ownership contrasts sharply with institutional holdings at the time of the IPO: Hanley and Wilhelm (1995), Ljungqvist and Wilhelm (2002), and Aggarwal (2003) find that institutions are allocated approximately 70% of the shares at the time of the IPO. However, the substantial difference between initial allocations and holdings at least one month after the offering is consistent with the evidence of Aggarwal (2003) and Chemmanur and Hu (2007). Aggarwal (2003) finds that institutions flip 26% of their allocated shares within the first two days of trading, and Chemmanur and Hu (2007) find that heavy selling continues throughout the first month. As a result, voluntary post-IPO holdings differ considerably from initial allocations.

Figure 1 indicates that institutional ownership in IPOs has increased dramatically over time. The solid line shows that average institutional ownership as a percentage of the public float (not including venture capitalists and other pre-IPO investors) was less than 10% in 1980, compared to approximately 35% in 2000. The finding of substantial increases in institutional ownership over time is similar to the pattern documented by Gompers and Metrick (2001) for the overall market. Figure 1 also demonstrates that this pattern of increased institutional interest in IPOs does not appear to be correlated with the volume of IPOs (shown in the grey bars).

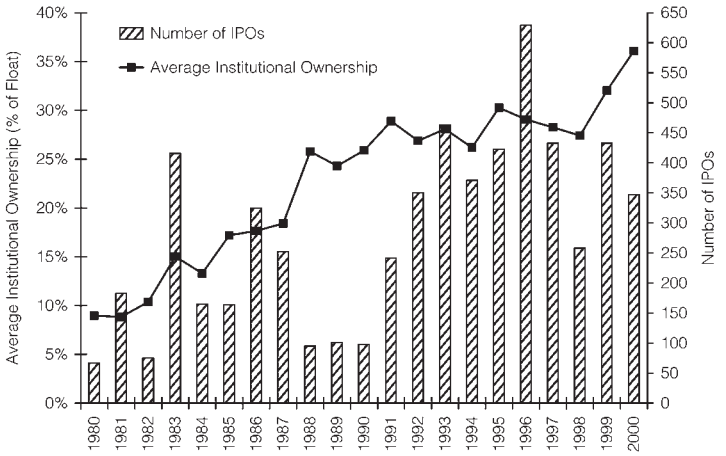
[4]For example, shares subject to lock-up provisions and Rule 144A restrictions are not part of the float (see Field and Hanka (2001)).

[5]Including all institutions (i.e., adding venture capitalists and owners of 15% of the shares offered), our measure of institutional ownership would be 48%.

FIGURE 1

Descriptive Statistics on Institutional Ownership

The sample consists of 5,890 IPOs between 1980 and 2000. The grey bars show the number of IPOs each year. The solid line shows the yearly average institutional ownership as a percent of the public float, measured one to four months after the IPO. The scale for number of IPOs is on the right, while the scale for average institutional ownership is on the left.



B. Definition of Institutional Holdings Portfolios

In order to compare the performance of firms according to their level of institutional ownership, we form portfolios based on institutional ownership. The simplest approach would be to rank all IPOs based on the percent of shares owned by institutions and to form portfolios based on this ranking. However, as indicated by Figure 1, this would bias the high institutional holding portfolios toward more recent IPOs. In addition, it would likely bias the high institutional holdings portfolios toward larger companies, as Gompers and Metrick (2001) show that institutions tend to favor bigger firms. Thus, we want to control for both year and offer size in forming the portfolios. Institutions' preference for larger companies stems in large part from their preference for more liquid companies. For a recent IPO, proceeds raised are likely to be a better estimate of liquidity than market capitalization. The majority of shares that were outstanding prior to the IPO and not sold in the IPO are restricted under lock-up agreements, meaning they cannot be traded and do not contribute to firm liquidity. For this reason, we use proceeds as our size measure.

We employ fractional logit methodology to obtain a measure of institutional ownership that is purged of both size and year effects. Specifically, each year we model the conditional mean of percent institutional ownership as a logistic function:

$$\mathrm{E}(\mathrm{INST}_{i,t}|x) \quad = \quad \frac{\exp(\beta_1 + \beta_2 * \mathrm{PROCEEDS})}{[1 + \exp(\beta_1 + \beta_2 * \mathrm{PROCEEDS})]},$$

where $INST_{i,t}$ is the institutional holdings for firm i (as a percent of public float) measured at Quarter 1, and $PROCEEDS_i$ is the IPO proceeds of firm i.[6] The parameters are estimated on a year-by-year basis using quasi-maximum likelihood. Unlike an ordinary least square (OLS) approach, the fractional logit methodology accounts for the fact that percent institutional ownership (by definition) has values between zero and one, and it maps expected institutional ownership onto the zero, one interval. Moreover, unlike a logistic transformation of institutional ownership, it can accommodate cases in which institutional ownership equals zero.[7]

We use the difference between actual institutional ownership and expected institutional ownership for each firm to group firms into quintiles annually, where quintile 1 (Q1) represents firms with the lowest unexpected institutional ownership, and quintile 5 (Q5) represents firms with the highest unexpected institutional ownership. Finally, we combine quintiles across years to form our five portfolios, based on institutional ownership net of firm size. Thus, Q1 includes all IPOs across our 21-year sample period that had the lowest unexpected institutional ownership in each year, while Q5 includes all IPOs across the 21-year sample period that had the highest unexpected institutional ownership in each year.[8] Throughout the remainder of the paper, we refer to unexpected institutional ownership as just institutional ownership.

Descriptive statistics for the full sample and for each institutional holding quintile are provided in Table 1. Institutional investors held an average (median) of 25.1% (24.3%) of the public float at Quarter 1. There is considerable dispersion in institutional holdings across the quintiles, with average holdings of 5.0% of the public float for the smallest quintile (median = 0.08%), compared to 47.0% for the largest quintile (median = 47.1%).

As discussed previously, it is important to control for firm size because prior literature shows that institutions tend to prefer larger firms. Moreover, larger IPOs tend to perform better following the IPO. Results in Table 1 show no significant difference between Q1 and Q5 for market capitalization. However, the proceeds measure suggests that we have actually slightly *overcorrected* for firm size. Firms in the low institutional holdings quintile have greater proceeds than those in the highest institutional holdings quintile, a difference that is significant at the 10% level. If anything, given the results of Brav and Gompers (1997) and Brav, Geczy, and Gompers (2000), that smaller IPOs experience the worst long-run performance, this difference potentially biases us against finding the predicted positive relation between institutional ownership and post-IPO performance.

In addition, Table 1 shows that abnormal returns over the first year after the IPO are significantly higher for Q5 firms than for Q1 firms, where abnormal

[6] See Papke and Wooldridge (1996) for further detail.

[7] We have also defined institutional holdings quintiles using a logit transformation of institutional holdings, similarly controlling for proceeds, following Nagel (2005). All results are qualitatively similar.

[8] While this approach should successfully control for the substantial increase in institutional ownership over time, it also results in the quintile composition being related to IPO volume. Specifically, in a high-volume year, the marginal Q5 firm will have lower residual ownership than the marginal Q5 firm in a low-volume year. However, in the final categorization, both firms are aggregated into one overall Q5 quintile.

TABLE 1

Firm Characteristics by Institutional Ownership

The sample consists of 5,890 IPOs between 1980 and 2000, which we classify into institutional ownership quintiles using a fractional logit methodology. Specifically, each year, we model the conditional mean of percent institutional ownership as a logistic function:

$$E(INST_{i,t}|x) = \frac{\exp(\beta_1 + \beta_2 * PROCEEDS)}{[1 + \exp(\beta_1 + \beta_2 * PROCEEDS)]}.$$

We calculate actual institutional ownership minus expected institutional ownership, and we use this measure for each firm to group firms into quintiles, where quintile 1 (Q1) represents firms with the lowest unexpected institutional ownership, and quintile 5 (Q5) represents firms with the highest unexpected institutional ownership. Proceeds are the proceeds raised in the IPO, and market cap is the market capitalization on the institutional holdings report date, both measured in year 2000 millions of dollars. Abnormal first-year return equals annual buy-and-hold returns, net of size and book-to-market-matched portfolios (i.e., compounded monthly returns over the first year). Means are reported for the full sample and for each institutional holdings quintile. Here, ***, **, and * indicate that the mean for the lowest institutional ownership quintile (Q1) is significantly different from that of the highest institutional ownership quintile (Q5) at the 1%, 5%, and 10% levels, respectively.

		Institutional Quintile				
Firm Characteristic	Full Sample	(lowest) Q1	Q2	Q3	Q4	(highest) Q5
Institutional ownership as % of public float	25.1%	5.0%	15.3%	25.0%	33.3%	47.0%***
Proceeds ($ million)	$56.5	$63.5	$58.0	$58.1	$52.9	$50.1*
Market cap ($ million)	$360.9	$314.5	$337.8	$387.5	$350.3	$413.7
Abnormal first-year return	−3.2%	−11.3%	−4.5%	−12.0%	−0.1%	0.7%***
No. of firms	5,890	1,171	1,182	1,182	1,183	1,172

returns are defined as IPO firm returns minus returns on a matched size, book-to-market portfolio.[9] This indication that stocks with higher institutional ownership perform significantly better than those with the lowest levels of institutional ownership is investigated in more detail in the next section.

III. Institutional Holdings and Post-IPO Returns

If institutions are sophisticated investors (Nagel (2005), Cohen et al. (2002), Michaely and Shaw (1994), and Badrinath et al. (1995)), then IPO firms with higher institutional shareholdings should outperform those with lower institutional shareholdings. As suggested in Table 1 and discussed in depth in this section, our findings demonstrate that this is, in fact, the case.

A. Descriptive Evidence on Long-Run Returns

We base our empirical tests on the five institutional holdings portfolios described in Section II, where quintile 1 (Q1) has the lowest institutional holdings

[9]Specifically, to form the size/book-to-market benchmark, all NYSE-listed firms are divided into five quintiles based on size and into five quintiles based on BM (though results are similar if benchmarks are formed based on all NYSE-, AMEX-, and NASDAQ-listed firms). The intersection of these groupings yields 25 size/BM portfolios. Each IPO firm is placed into its appropriate portfolio, and its return is compared to the average returns across all other firms in that portfolio (i.e., all firms on CRSP with size and BM data after excluding firms that have gone public within the past three years).

and quintile 5 (Q5) has the highest. We obtain firm returns for three years after the first institutional holdings date. In cases where a firm delisted prior to this date, we obtain the delisting return if available and assume that the proceeds are invested in the equally weighted market index.

Figure 2 provides descriptive evidence for a strategy of holding Q5 and shorting Q1. Specifically, Graph A shows one-quarter, one-year, and three-year buy-and-hold returns for Q5 minus Q1, and Graph B shows cumulative returns for the same portfolio over the same horizons.[10] Both graphs show raw returns and returns net of a matched size/BM portfolio (as defined in Table 1). Figure 2 suggests that a strategy of buying Q5 and shorting Q1 would earn excess returns at each horizon, for both cumulative and buy-and-hold returns and using either raw or abnormal returns.

B. Three-Factor Regressions

As noted by Fama (1998), cross-correlations between firm returns prevent accurate significance tests from being conducted on long-run, event time, buy-and-hold, and cumulative abnormal returns. Thus, we rely on three-factor regressions to test the significance of the relations suggested in Figure 2.[11] Table 2 shows regressions of monthly returns of the high institutional quintile (Q5), the low institutional quintile (Q1), and Q5 minus Q1 on the three Fama-French factors. Following Fama and French (1993), the factors include the market return minus the risk-free rate (RMRF), returns on a portfolio of small firms minus returns on a portfolio of big firms (SMB), and returns on a high BM portfolio minus returns on a low BM portfolio (HML). To account for the effects of hot issue markets, regressions are estimated using weighted least squares, where each monthly return is weighted by the number of IPOs in the portfolio. The intercept from such a regression can be interpreted as a measure of abnormal performance.

Table 2 shows three-factor regressions over one-quarter, one-year, two-year, and three-year time horizons, meaning that a firm is included in the regression sample for the first three, 12, 24, and 36 months, respectively, after its first institutional reporting date. Over the one-quarter, one-year, and two-year horizons, we see that firms with the lowest institutional holdings have significantly negative abnormal returns, as reflected by the significantly negative intercept in the Q1 regression. Moreover, the intercept in the Q5−Q1 regression is significantly positive at the one quarter, one-year, and two-year horizons, indicating that firms with the highest levels of institutional ownership perform significantly better than those with the lowest. During the first quarter after the IPO (not including the initial return), the high institutional holdings portfolio outperforms the low institutional

[10] Buy-and-hold returns represent compounded monthly returns, and cumulative returns represent summed monthly returns.

[11] We also test the significance of these relations using calendar time *portfolios* (as opposed to calendar time *regressions,* which we report), where the benchmark is one of 25 matched size, book-to-market portfolios. Results (not shown) are similar.

FIGURE 2

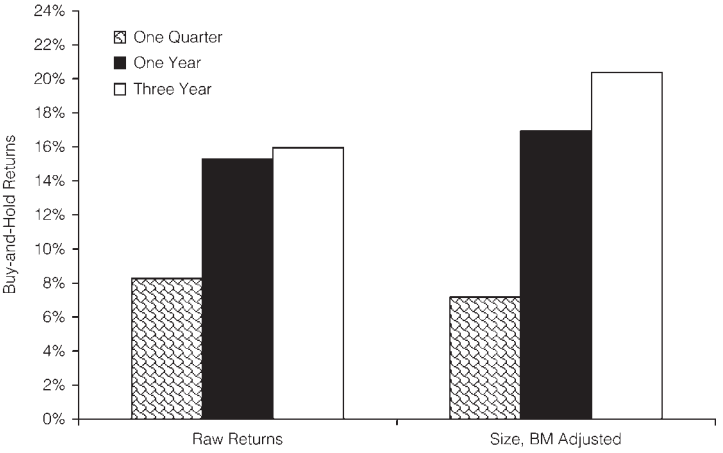
Difference in Returns for Highest Institutional Quintile Portfolio Minus Lowest Institutional Quintile Portfolio

The sample consists of 5,890 IPOs between 1980 and 2000. We use a fractional logit methodology to form the institutional ownership quintiles. Specifically, each year, we model the conditional mean of percent institutional ownership as a logistic function:

$$E(\text{INST}_{i,t}|x) = \frac{\exp(\beta_1 + \beta_2 * \text{PROCEEDS})}{[1 + \exp(\beta_1 + \beta_2 * \text{PROCEEDS})]}.$$

We calculate actual institutional ownership minus expected institutional ownership and use this measure for each firm to group firms into quintiles, where quintile 1 (Q1) represents firms with the lowest unexpected institutional ownership, and quintile 5 (Q5) represents firms with the highest unexpected institutional ownership. Finally, we calculate buy-and-hold and cumulative returns on Q5 − Q1 over one quarter, one year, and three years following the first institutional holdings reporting date between one and four months after the IPO. Both raw returns and abnormal returns net of size and book-to-market-matched portfolios are shown.

Graph A. Buy-and-Hold Returns (*High Inst − Low Inst*)



Graph B. Cumulative Returns (*High Inst − Low Inst*)

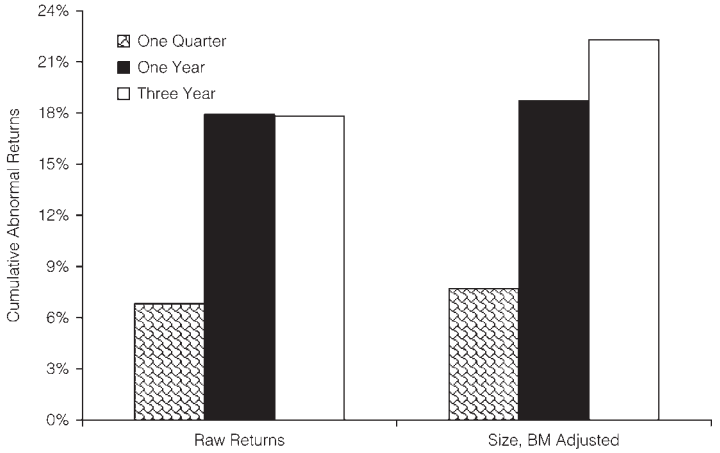


TABLE 2

Fama-French Factor Regressions for the Highest Minus Lowest Institutional Ownership Quintiles

The sample consists of 5,890 IPOs between 1980 and 2000. Table 2 shows weighted least squares regressions of monthly returns on the three Fama-French factors: the market return minus the risk-free rate (RMRF), returns on a portfolio of small firms minus returns on a portfolio of big firms (SMB), and returns on a high BM portfolio minus returns on a low BM portfolio (HML). Weights equal the number of IPOs each month. We use a fractional logit methodology to form the institutional ownership quintiles. Specifically, each year, we model the conditional mean of percent institutional ownership as a logistic function:

$$E(INST_{i,t}|x) = \frac{\exp(\beta_1 + \beta_2 * PROCEEDS)}{[1 + \exp(\beta_1 + \beta_2 * PROCEEDS)]}.$$

We calculate actual institutional ownership minus expected institutional ownership, and we use this measure for each firm to group firms into quintiles, where quintile 1 (Q1) represents firms with the lowest unexpected institutional ownership, and quintile 5 (Q5) represents firms with the highest unexpected institutional ownership. The dependent variables equal monthly returns on Q1 net of the risk-free rate, monthly returns on Q5 net of the risk-free rate, and monthly returns on Q5 − Q1, for firms that have gone public within the past one quarter, one year, two years, and three years. The *t*-statistics are shown in parentheses, and ***, **, and * indicate significantly different from zero at the 1%, 5%, and 10% levels, respectively.

	Intercept	RMRF	SMB	HML	Adj. R^2
Panel A. One Quarter					
Q1 (low inst)	−0.012**	1.303***	0.984***	−0.419**	0.54
	(−2.30)	(9.98)	(6.12)	(−2.16)	
Q5 (high inst)	0.008	1.523***	0.546***	−0.656***	0.62
	(1.58)	(12.80)	(3.71)	(−3.73)	
Q5 − Q1 (high − low)	0.020***	0.221	−0.388**	−0.209	0.02
	(3.26)	(1.42)	(−2.02)	(−0.91)	
Panel B. One Year					
Q1	−0.014***	1.230***	0.916***	−0.332**	0.61
	(−3.48)	(12.05)	(7.24)	(−2.19)	
Q5	−0.002	1.384***	0.784***	−0.485***	0.74
	(−0.66)	(16.65)	(7.57)	(−3.89)	
Q5 − Q1	0.011***	0.156	−0.131	−0.161	0.02
	(2.82)	(1.54)	(−1.04)	(−1.06)	
Panel C. Two Years					
Q1	−0.011***	1.266***	0.963***	−0.227	0.61
	(−2.76)	(12.49)	(7.63)	(−1.49)	
Q5	−0.004	1.356***	0.825***	−0.370***	0.77
	(−1.32)	(18.61)	(9.07)	(−3.37)	
Q5 − Q1	0.007*	0.084	−0.147	−0.155	0.01
	(1.95)	(0.93)	(−1.31)	(−1.15)	
Panel D. Three Years					
Q1	−0.006	1.222***	0.908***	−0.230	0.58
	(−1.57)	(11.80)	(7.06)	(−1.48)	
Q5	−0.002	1.302***	0.799***	−0.305***	0.78
	(−0.85)	(19.03)	(9.41)	(−2.97)	
Q5 − Q1	0.004	0.074	−0.102	−0.085	−0.001
	(1.19)	(0.88)	(−0.97)	(−0.67)	

holdings portfolio by approximately 6%. Over the one-year horizon, the high institutional portfolio outperforms by approximately 1% per month.[12]

In sum, institutions are able to avoid the worst underperformers, and a strategy of investing in Q5 while shorting Q1 results in economically and statistically significant returns. However, it is important to note that institutions are not able

[12]Results using a 1980–1998 sample are similar if a momentum factor is added to the three-factor regression described here. However, the unique characteristics of the bubble period, combined with extreme volatility in the momentum factor during these years, causes results for the overall 1980–2000 period to be weaker using the four-factor model.

to systematically identify the best IPOs. The intercept in the Q5 regression is insignificantly different from zero at every horizon.

IV. The Determinants of Institutional Investment

Results in the previous section indicate that IPOs with the highest institutional investment significantly outperform those with the lowest. This section focuses on understanding the source of this return difference. While prior literature has attributed institutions' superior returns to advantages that only institutions have (e.g., private information, ability to monitor, etc.), following Odean (1998) and Barber and Odean (2008), we posit that at least a portion of these superior returns may simply reflect the fact that institutions pay closer attention to readily available public information.

Prior literature has found that long-run, post-IPO performance is predictable based on a variety of firm- and offer-specific characteristics. For example, Ritter (1991) finds that older IPO firms earn higher long-run returns. Carter et al. (1998) find that the underperformance of IPOs over a three-year holding period is less severe for IPOs brought public by more prestigious underwriters. Purnanandam and Swaminathan (2004) find that IPOs issued at high price multiples earn high initial returns but low long-run returns. Brav and Gompers (1997) find that long-run IPO underperformance is concentrated in small, non-venture-backed IPOs, while Brav, Geczy and Gompers (2000) find that underperformance is concentrated primarily in small firms with low book-to-market ratios. Krigman, Shaw, and Womack (1999) find that initial returns are positively related to one-year returns.[13]

If post-IPO performance is predictable, then we would expect institutions to invest accordingly. Specifically, institutional investment should be related to publicly available firm characteristics. Moreover, these same characteristics should also be related to firm performance.

A. Firm Type at the Time of the IPO

To examine the relation between institutional investment and various public information measures, we purposely choose measures of firm and offer quality that should be readily available to any investor. Specifically, we look at firm age, underwriter rank, venture capital backing, proceeds, and the price update (where price update is measured as the percent difference between the offer price and the midpoint of the filing range). In addition, we include the following accounting information: sales/assets, liabilities/assets, working capital/assets, and a dummy variable equal to one for firms with positive earnings before interest and taxes (EBIT), all measured the year before the IPO. We also include yearly dummies to account for the overall increase in institutional ownership over time (coefficients not reported).

[13]Some of these findings have been disputed. For example, Logue, Rogalski, Seward, and Foster-Johnson (2002) find no relation between underwriter quality and post-IPO performance. Also, in a multivariate regression, Ritter (1991) finds no relation between underpricing and subsequent three-year returns.

Table 3 shows the results from a fractional logit regression of institutional holdings on the above public information measures. Institutional holdings are measured as a percent of the public float, between one and four months after the IPO (similar to earlier tables).

TABLE 3

What Characteristics Attract Institutional Investment in IPOs?

The sample consists of 5,890 IPOs between 1980 and 2000. A fractional logit regression is estimated, where the dependent variable equals institutional ownership as a percent of the public float. Institutional holdings are measured at the first reporting date occurring between one and four months post-IPO. Explanatory variables represent information known at the time of the offering. The log of proceeds represents the log of proceeds raised in the offering. Firm age is the age of each firm at the time of the IPO. Underwriter rank is the average Carter-Manaster (1990) underwriter ranking score, as updated by Loughran and Ritter (2004). The venture capital (VC) dummy equals one for venture-backed IPOs and zero otherwise. Sales/assets, liabilities/assets, and working capital/assets are all measured at the end of the fiscal year ending prior to the IPO. The positive earnings before interest and taxes (EBIT) dummy equals one if EBIT in year $t-1$ is positive, and zero otherwise. Price run-up is the percent difference between the midpoint of the filing range and the offer price. Yearly dummies are included as additional explanatory variables but are not reported. *Z*-statistics are given in parentheses, and ***, **, and * indicate significantly different from zero at the 1%, 5%, and 10% levels, respectively.

	Coefficient	*Z*-Statistic
Intercept	−4.38***	(−7.11)
Log(Proceeds)	1.86***	(11.37)
Log(Firm age)	0.18**	(2.39)
Underwriter rank	0.18***	(4.87)
VC dummy	0.44***	(2.63)
Sales/assets$_{t-1}$	−0.01	(−0.29)
Liabilities/assets$_{t-1}$	0.09	(0.82)
Working capital/assets$_{t-1}$	0.25*	(1.87)
Positive EBIT dummy$_{t-1}$	0.47***	(2.91)
Price run-up	−0.79**	(−2.22)
Log likelihood	−848.5	

Consistent with institutions' preference for larger, more liquid stocks, Table 3 shows that institutions are more likely to invest in larger offerings. Institutions appear to value the certification of other parties, as they are significantly more likely to invest in firms that are brought public by higher ranked underwriters and firms that are backed by venture capital. In addition, institutions seem to prefer less risky firms, as they are more likely to invest in firms that are older, firms that have positive earnings prior to the IPO, and firms with more working capital as a fraction of total assets prior to the IPO.

Finally, our results indicate that institutions are less likely to invest in firms with a higher price update. This may reflect a higher tendency to flip shares in such firms, meaning institutions would not hold these stocks by the time we measure institutional holdings (Krigman et al. (1999), Aggarwal (2003), and Ljungqvist, Nanda, and Singh (2006)). Alternatively, it may reflect a tendency of individuals to invest in "attention-grabbing stocks" while institutions are less likely to engage in such behavior (Barber and Odean (2008)). Firms with high price updates tend to have high initial returns (see, e.g., Hanley (1993)), and such issues frequently receive considerable media coverage (Cook, Kieschnick, and Van Ness (2006)).[14]

We also estimate a logit regression, examining the likelihood that institutions invest in firms with certain characteristics. Results (not shown in tables) indicate

[14]However, we find no relation between institutional ownership and initial returns.

that the determinants of the *presence* of institutional investment are similar to the determinants of the *magnitude* of institutional investment.

B. The Link between Firm Type and Post-IPO Stock Returns

Evidence up until this point has shown that firms with the highest levels of institutional investment earn significantly higher returns than those with the lowest, and that institutional investment is significantly related to information readily available at the time of the IPO. These findings suggest that at least a portion of institutions' higher returns potentially stem from a greater proficiency in interpreting readily available public information. Individuals misinterpret the relevance of such information, and they earn lower returns as a result.

As a first step toward providing more definitive evidence on this issue, Figure 3 and Table 4 examine average post-IPO returns, based upon the factors that institutions appear to use in making their IPO investment decisions. From Table 3, we know that institutions prefer venture-capital-backed IPOs, IPOs brought public by higher ranked underwriters, IPOs with higher proceeds, older firms, firms with positive pre-IPO earnings, and firms with higher pre-IPO working capital. Thus, we bifurcate our sample based on each of these dimensions and then compare returns for each of the groups. Specifically, for underwriter rank, proceeds, age, and working capital/total assets (WC/TA), we determine the median measure for companies going public in each year and rank firms above or below that yearly median. We also examine the same return measures for firms with positive versus nonpositive earnings in the year prior to the IPO, and venture versus non-venture backing.

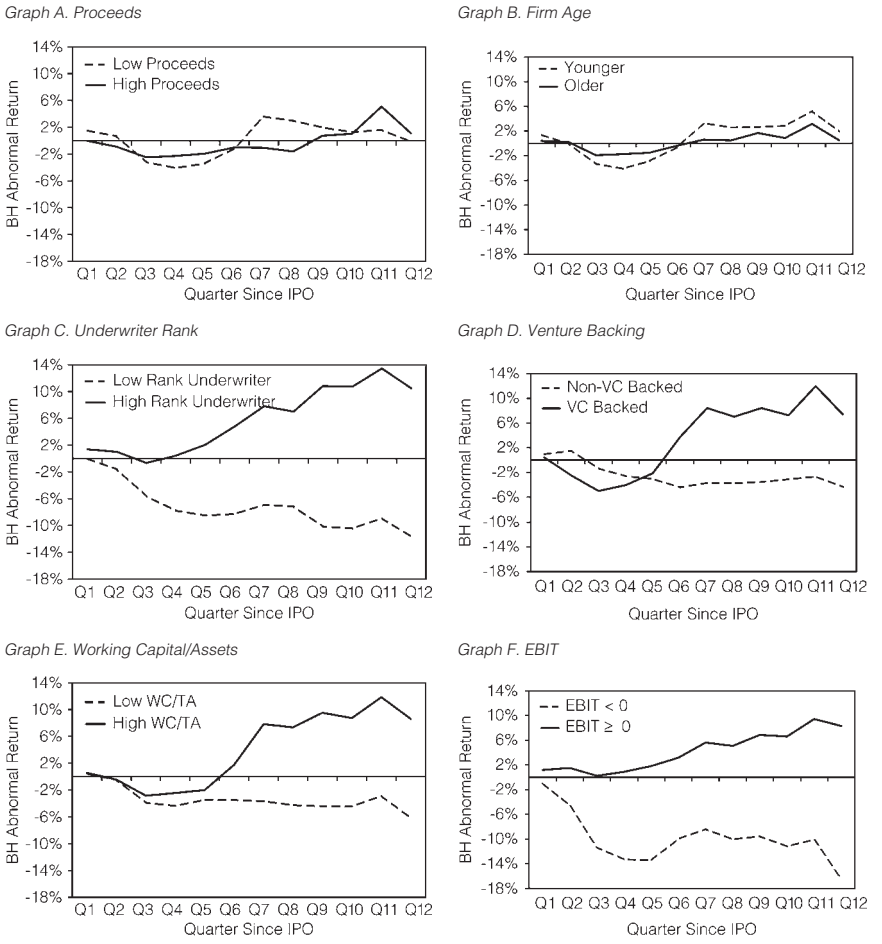
Figure 3 provides descriptive evidence on the long-run returns of IPO firms based on each of these characteristics, and Table 4 tests the significance of these relations. Specifically, Figure 3 shows buy-and-hold abnormal returns, relative to size- and book-to-market-matched firms, for quarterly horizons of one quarter through 12 quarters after the IPO. Because significance tests cannot be conducted on these event-time buy-and-hold returns, Table 4 shows intercepts from three-factor regressions, where the dependent variable equals returns on various portfolios of firms that have gone public within the past one quarter (Panel A), one year (Panel B), and three years (Panel C). Specifically, for each characteristic, we form three portfolios: i) a long position in firms with an above-median characteristic; ii) a long position in IPOs with a below-median characteristic; and iii) a long position in IPOs with an above-median characteristic combined with a short position in IPOs with a below-median characteristic. We regress the returns on each of these portfolios (portfolios 1 and 2 are net of the risk-free rate) on the three factors and report the intercept from this regression (similar to Table 2).

Both Figure 3 and Table 4 show that institutions are correct in paying attention to these readily available measures of firm and offer quality. For example, consistent with Carter et al. (1998), Figure 3 shows that a simple strategy of investing in firms with higher ranked underwriters dominates a strategy of investing in firms with lower-ranked underwriters. Table 4 confirms that the difference is significant at all three horizons (one quarter, one year, and three years), in both statistical and economic terms. Specifically, a portfolio of firms with above-ranked

FIGURE 3

Abnormal Buy-and-Hold Returns for Newly Public Firms
Based on Firm Characteristics Known at the IPO

Figure 3 shows mean abnormal buy-and-hold returns, net of size and book-to-market-matched portfolios, for 5,890 IPOs between 1980 and 2000 for investment horizons of one quarter through 12 quarters post-IPO. For proceeds, firm age, underwriter rank, and working capital (scaled by total assets), we divide the sample annually into two equal-sized groups, one group with an above-median score on the characteristic and the other with a below-median score on the characteristic. For venture capital backing, we break the sample into venture-backed firms and non-venture-backed firms. For earnings, we break firms into groups based on positive earnings (EBIT $\geq$ 0) and negative earnings (EBIT $<$ 0) in the year before the IPO.



underwriters outperforms a portfolio of firms with below-ranked underwriters by approximately 1% per month over the year following the IPO (as shown in Panel B), a performance difference that is significant at the 1% level.

Similarly, firms that are venture-backed significantly outperform their counterparts at every horizon (consistent with Brav and Gompers (1997)), as do firms with higher working capital as a fraction of total assets prior to the IPO. Finally, there is some evidence that older firms outperform their younger counterparts, consistent with Ritter (1991), and that issues with higher proceeds outperform

TABLE 4

Intercepts from Fama-French Regressions by Firm Characteristics

The sample consists of 5,890 IPOs between 1980 and 2000. For proceeds, firm age, underwriter rank, and working capital (scaled by total assets), we divide the sample annually into two equal-sized groups each year, one group with an above-median score on the characteristic and the other with a below-median score on the characteristic. For venture capital backing, we break the sample into venture-backed firms and non-venture-backed firms. For earnings, we break firms into groups based on positive earnings (EBIT $\geq$ 0) and negative earnings (EBIT $<$ 0) in the year before the IPO. For example, for the proceeds regressions in Panel A of Table 4, we form two portfolios: firms that have gone public within the past three months with above-median proceeds, and firms that have gone public within the past three months with below-median proceeds. We regress the monthly returns net of the risk-free rate on each of these portfolios on the Fama-French factors. Intercepts from these regressions, with *t*-statistics in parentheses, are shown in the first two columns. The last column shows intercepts from a similar regression where the dependent variable is returns on the first portfolio minus returns on the second portfolio. Regression portfolios are constructed similarly for the other variables (VC backing, positive EBIT, etc.) and for the other horizons (one year and three years), shown in Panels B and C, respectively; ***, **, and * indicate significantly different from zero at the 1%, 5%, and 10% levels, respectively.

	Quality		
	High	Low	High Minus Low
Panel A. One Quarter			
Proceeds (high quality = high proceeds)	0.002 (0.65)	−0.002 (−0.52)	0.005 (1.26)
Firm age (high quality = older)	−0.0003 (−0.07)	0.0019 (0.45)	−0.0022 (−0.64)
Underwriter rank (high quality = high rank)	0.006 (1.47)	−0.004 (−1.05)	0.010*** (3.05)
VC backing (high quality = VC backed)	0.005 (1.03)	−0.003 (−0.96)	0.008** (2.08)
WC/TA_{YR-1} (high quality = high WC/TA)	0.003 (0.58)	−0.004 (−0.98)	0.006* (1.66)
Positive $EBIT_{YR-1}$ (high quality = positive EBIT)	−0.003 (−1.06)	0.001 (0.22)	−0.004 (−0.87)
Panel B. One Year			
Proceeds (high quality = high proceeds)	−0.003 (−1.00)	−0.008*** (−2.25)	0.005** (2.33)
Firm age (high quality = older)	−0.003 (−1.19)	−0.006* (−1.82)	0.003 (1.35)
Underwriter rank (high quality = high rank)	0.00002 (0.01)	−0.0108*** (−3.29)	0.0109*** (5.66)
VC backing (high quality = VC backed)	0.00002 (0.01)	−0.0079*** (−2.64)	0.0079*** (3.19)
WC/TA_{YR-1} (high quality = high WC/TA)	−0.003 (−0.81)	−0.007** (−2.35)	0.004** (2.04)
Positive $EBIT_{YR-1}$ (high quality = positive EBIT)	−0.005** (−2.09)	−0.007* (−1.66)	0.002 (0.54)
Panel C. Three Years			
Proceeds (high quality = high proceeds)	−0.004 (−1.47)	−0.003 (−0.87)	−0.001 (−0.46)
Firm age (high quality = older)	−0.002 (−0.72)	−0.005 (−1.43)	0.003* (1.92)
Underwriter rank (high quality = high rank)	−0.001 (−0.41)	−0.006* (−1.80)	0.005*** (3.07)
VC backing (high quality = VC backed)	0.001 (0.22)	−0.005* (−1.78)	0.006*** (2.73)
WC/TA_{YR-1} (high quality = high WC/TA)	−0.0002 (−0.07)	−0.0052* (−1.78)	0.0049*** (3.19)
Positive $EBIT_{YR-1}$ (high quality = positive EBIT)	−0.003 (−1.28)	−0.005 (−1.37)	0.003 (0.86)

those with lower proceeds. However, these relations are only significant at some of the horizons.

C. Private or Public Information?

The previous section showed that, when investing in IPOs, institutional investors choose firm attributes associated with higher quality, and many of these attributes are associated with better long-run performance. So, is the superior performance we report for firms with larger institutional ownership due to institutions' focus on publicly known firm attributes, or are institutions' superior returns primarily attributable to their private information?

To address this issue, we partition institutional investment in each firm into two parts: expected institutional ownership based on our readily available public information measures (i.e., the explanatory variables given in Table 3), and unexpected institutional ownership, equal to the difference between actual institutional ownership and the level of institutional ownership that we would have expected given our public information measures (i.e., based on the Table 3 regression). If institutions' superior returns are attributable to private information, then we would expect to find a relation between our unexpected institutional investment measures and post-IPO returns. To test this, we group firms, by year, into quintiles based on unexpected institutional investment (similar to Table 2, except that in this case firms are grouped based on their Table 3 residuals). Firms with the lowest level of unexpected institutional investment are placed into Q1, and firms with the highest level are placed into Q5.

Analogous to Table 2, Table 5 shows the intercepts (alphas) from regressions of monthly returns for Q5 minus Q1 on the three Fama-French factors. We note that our measure of expected institutional investment is based on just a few measures of public information. As a result, the unexpected institutional investment measure is not a perfect measure of private information—it is likely to include some public information. A finding that the unexpected institutional investment measure is a significant predictor of returns could indicate that either private information is important or that we've omitted some public information. However, a finding that this measure fails to predict returns would indicate that institutions' main source of information is unlikely to be private information.

Looking at Table 5, we see that the Q5 − Q1 intercept is only significant at the three-year horizon, and in that case it is only significant at the 10% level. Overall, residual institutional ownership, which is purged of readily available measures of firm and offer quality, has little ability to predict higher stock returns. These findings suggest that institutional investors seem to rely primarily on publicly available information when choosing which IPOs to invest in.

In sum, IPOs with larger institutional investment outperform those with smaller institutional investment, but institutions' higher returns are primarily attributable to their attention to publicly available information. Our findings contrast somewhat with those of Chemmanur and Hu (2007), who conclude that readily available public information measures cannot completely explain institutions' advantage over the first few months after the IPO. However, Chemmanur and Hu

TABLE 5

Fama-French Factor Regressions for the Highest Minus Lowest Institutional Ownership Quintiles, Controlling for Public Information

The sample consists of 5,890 IPOs between 1980 and 2000. Table 5 shows weighted least squares regressions of monthly returns on the three Fama-French factors: the market return minus the risk-free rate (RMRF), returns on a portfolio of small firms minus returns on a portfolio of big firms (SMB), and returns on a high BM portfolio minus returns on a low BM portfolio (HML). Weights equal the number of IPOs each month. To form the institutional ownership quintiles, we estimate fractional logit regressions each year of institutional ownership on the exogenous variables shown in Table 3. We use the difference between actual institutional ownership and expected institutional ownership as our measure of unexpected institutional investment—that is, institutional ownership purged of publicly available information. We use this unexpected institutional ownership for each firm to group firms into quintiles annually, where quintile 1 (Q1) represents firms with the lowest unexpected institutional ownership and quintile 5 (Q5) represents firms with the highest unexpected institutional ownership. The dependent variable equals monthly returns on Q5 − Q1 for firms that have gone public within the past one quarter, one year, two years, and three years. The *t*-statistics are shown in parentheses, and * indicates significantly different from zero at the 10% level.

Unexpected Institutional Ownership, Conditional on Public Information Measures	Intercept from Three-Factor Model
One quarter	
Q5 − Q1 (High − Low)	0.002 (0.39)
One year	
Q5 − Q1	0.001 (0.33)
Two years	
Q5 − Q1	0.004 (1.59)
Three years	
Q5 − Q1	0.004* (1.73)

(2007) do not include financial performance variables in their measures of public information, making it difficult to directly compare findings.

D. Individual Investors

Results in Tables 2–5 suggest that individual investors do not pay enough heed to publicly available measures of firm quality known to be associated with better stock performance. To more directly test this assertion, we focus on newly public firms with no institutional ownership—that is, firms with only individuals invested in them. We put firms into two distinct groups: i) firms with *positive* institutional investment as of the first institutional reporting date (the "Institutions" group), and ii) firms with *zero* institutional investment as of the same date (the "Individuals Only" group). The Institutions group consists of 5,246 firms (89% of the total IPO sample), while the Individuals Only group consists of 644 firms (11% of the total IPO sample).[15] Next, we look at characteristics that can be meaningfully measured both prior to and over the several years following the IPO, conditioned on the initial presence of institutional investment.

Focusing first on firm characteristics prior to the IPO, results in Figure 4 are consistent with those shown in Table 3: Individuals Only firms are less likely to

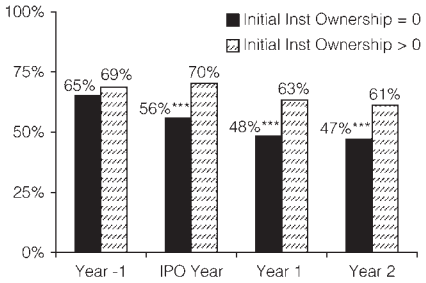
[15]As one might expect, the average market capitalization of the "Individuals Only" firms is significantly smaller than that of the "Institutions" group. However, for purposes of our analysis, it is perhaps more important to note that the "Individuals Only" firms do not solely represent the smallest firms in our sample. The median size of the "Individuals Only" group is $26.2 million, and 310 firms have a market capitalization below this. Notably, a similar number (342) of "Institutions" firms have a market capitalization below this cutoff. Thus, the substantial size difference is primarily driven by the fact that nearly all large firms receive institutional investment; however, many (but not all) small firms also have institutional investors.

FIGURE 4

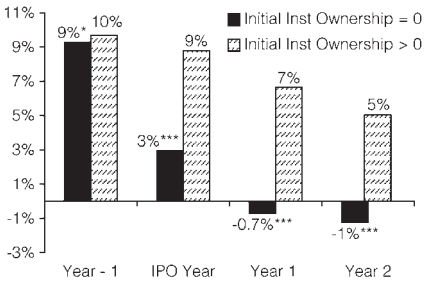
Accounting Performance for Firms With and Without Institutional Ownership at Quarter 1

The sample consists of 5,890 IPOs from 1980–2000 and is broken into groups based on the presence of institutional ownership measured between one and four months after the IPO. In Graphs A–D of Figure 4, the black bars show accounting variables for the 644 firms with no initial institutional shareholders, while the grey bars show the same ratios for the 5,246 firms with institutional shareholders. The accounting variables shown are the percent of firms with positive EBIT, median EBIT/total assets (EBIT/TA), median retained earnings/total assets (RE/TA), and median working capital/total assets (WC/TA), all measured the year before the IPO (Year −1), the year the firm went public (IPO Year), the year after the IPO (Year 1), and two years after the IPO (Year 2). For Graphs A–D, *** and * indicate a significant difference at the 1% and 10% levels, respectively, of the variable in question between the groups with and without institutional shareholders. Graph E shows buy-and-hold returns for one quarter through 12 quarters after the IPO for firms with and without institutional shareholders.

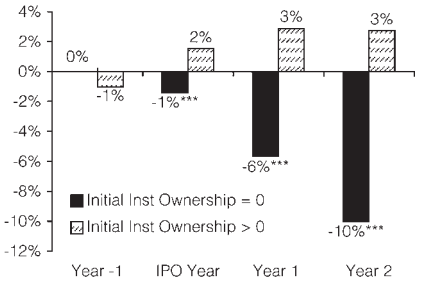
Graph A. Percent of Firms with EBIT > 0



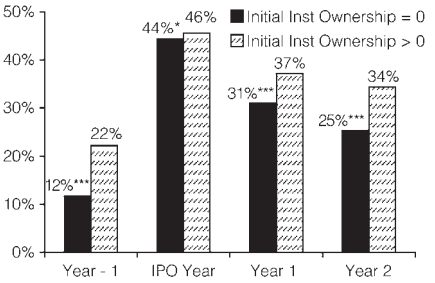
Graph B. Median EBIT/TA



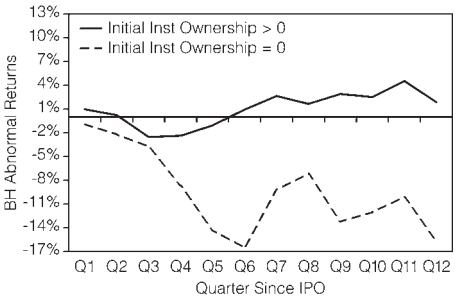
Graph C. Median RE/TA



Graph D. Median WC/TA



Graph E. Buy-and-Hold Returns



have positive earnings before the IPO (denoted year −1 in the figure), and they have less working capital prior to the IPO. Specifically, Graph A shows that 65% of firms in the Individuals Only group have positive earnings before going public, compared to 69% in the Institutions group (although the difference is not significant in the univariate comparison). In Graph D, we see that the Individuals Only

firms have median WC/TA of 12% in the year −1, versus 22% for the Institutions firms.

These apparent differences in firm quality become much more dramatic after the IPO. Looking at the fraction of firms with positive earnings, we see a drop over time for both groups, but the Institutions group always contains significantly more firms with positive earnings. Moreover, differences in the level of earnings (median EBIT/TA) between the two groups become highly significant starting in the year of the IPO (denoted year 0 in the figure). The Individuals Only firms' EBIT/TA drops from a median of 9% before the IPO to only 3% during the IPO year and becomes *negative* after that. In contrast, the Institutions firms' median EBIT/TA experiences a modest drop from 10% to 9% between year −1 and year 0, and the median never becomes negative.

Consistent with these patterns in earnings, Graph C of Figure 4 shows that the Institutions group's retained earnings tend to increase over time, while those for the Individuals Only group decrease rapidly. As a result, the difference between the two groups is significantly different in every period after year −1. Finally, similar to the patterns observed in year −1, Individuals Only firms have significantly lower working capital in the IPO year and the following two years.

Overall, these accounting ratio results demonstrate that, along many dimensions, institutions are investing in higher quality firms than are individuals, and the differences in quality become even more pronounced over time.[16] Notably, individuals have ready access to the same quality metrics as institutions, yet they evidently either pay less attention to them or misinterpret their relevance. For example, while firms that are older and have higher WC/TA perform significantly better, Table 3 shows that individuals disproportionately invest in firms that are younger and have lower WC/TA. Similarly, while firms that are VC-backed, have higher ranked underwriters, and have higher proceeds are also more likely to perform better, findings in Table 3 suggest that individuals are more likely to invest in the opposite types of firms.

In sum, individuals are disproportionately investing in the types of firms that, according to Table 4, earn significantly lower abnormal returns over the long run. Consistent with this conjecture, Graph E of Figure 4 shows that the difference in stock returns between firms with versus firms without institutional investment is substantial. The Individuals Only firms substantially underperform, earning 16% less than their size- and book-to-market-matched counterparts after three years; the Institutions firms do not exhibit such underperformance. In addition, we also find that Individuals Only firms are substantially more likely to be delisted for poor performance than are Institutions firms: Some 33% of all Individuals Only firms delist for poor performance within five years of the IPO, compared with only 13% of firms with institutional holdings (not reported in the table).

[16]We have also estimated all the above relations on a sample of "Individuals Only" and "Institutions" firms that are more similar in size. Specifically, we base our tests on all firms with a market capitalization below $26.2 million (the median market capitalization of the "Individuals Only" firms). This results in a sample of 310 "Individuals Only" firms and 342 "Institutions" firms. Findings with respect to median EBIT/TA, the percent of firms with positive EBIT/TA and median RE/TA are all similar, although the differences in firms with positive EBIT/TA are significant for this sample in year −1. We do not find significant differences in WC/TA using this alternative sample.

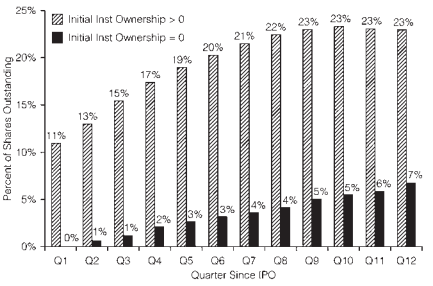
Individuals (as a group) will only experience this poor performance if they are the ones who hold these stocks over the long term. Figure 5 indicates that this is in fact the case. Specifically, Figure 5 shows that newly public firms that fail to garner institutional interest early on are unlikely to ever attract institutional investors. More than half of all firms without institutional investors after the IPO continue to have no institutional investors three years later. In comparison, average institutional ownership among those firms that had positive institutional ownership shortly after the IPO increases substantially over time, from 11% in Quarter 1 to 23% in Quarter 12 (median ownership grows from 8% in Quarter 1 to 12% in Quarter 12). These statistics provide additional evidence that individuals bear the brunt of IPO underperformance.

FIGURE 5

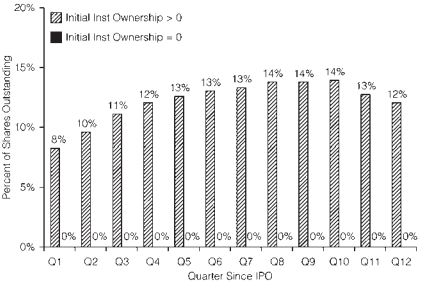
Institutional Ownership Over Time for Newly Public Firms With and Without Institutional Ownership at Quarter 1

The sample consists of 5,890 IPOs from 1980–2000 and is broken into groups based on the presence of institutional ownership measured within one and four months after the IPO (referred to as Quarter 1). In Graph A of Figure 5, the black bars show average institutional ownership over the first 12 quarters post-IPO for the 644 firms with no initial institutional shareholders at Quarter 1, while the grey bars show average institutional ownership for the 5,246 firms with institutional shareholders at Quarter 1. In Graph B, the black bars show median institutional ownership over the first 12 quarters post-IPO for the 644 firms with no initial institutional shareholders at Quarter 1, while the grey bars show median institutional ownership for the 5,246 firms with institutional shareholders at Quarter 1.

Graph A. Average Institutional Ownership Over Time



Graph B. Median Institutional Ownership Over Time



Our results are consistent with a growing body of literature positing that individual or sentiment investors substantially affect the IPO market. Ljungqvist et al. (2006) develop a model in which the existence of sentiment investors, coupled with short-sale constraints, leads to long-run underperformance of IPOs. Cook et al. (2006) build on the models of Ljungqvist et al. (2006) and Derrien (2005) by arguing that investment bankers have an incentive to induce sentiment investors into the market. Lowry (2003) shows that investor sentiment affects the timing of firms' IPOs. Cook, Jarrell, and Kieschnick (2003) provide evidence that investor sentiment has a negative effect on long-run returns and on firm survival rates. Consistent with all these papers, our results show that underperformance is most pronounced in firms with a larger presence of these sentiment—or individual—investors.

In a study of the when-issued (grey) market that precedes European IPOs, Cornelli, Goldreich, and Ljungqvist (2006) find that high grey market prices (which are largely set by retail investors) are a good predictor of both first-day

aftermarket prices and long-run price reversals. Purnanandam and Swaminathan (2004) show that the IPOs most overvalued relative to industry peer price multiples provide high initial returns but low long-run returns and low profitability. They argue that IPO investors pay insufficient attention to profitability when valuing IPOs. Our results support these claims by showing that individual investors are more likely to ignore firm fundamentals when investing in IPOs, resulting in especially poor long-run performance.

This growing body of literature demonstrates that investor sentiment influences many aspects of the IPO market, with substantial effects on the long-run returns and survival rates of newly public companies. Our paper shows that individual investors would be more likely to avoid these poor outcomes by paying more attention to the ways in which readily available firm and offer characteristics are related to future expected returns, much as institutional investors appear to do.

V. Do Institutions Earn Higher Returns through Monitoring?

Our results have shown that newly public firms with high institutional investment outperform those with low institutional investment. Although we have asserted that the return differential is due to the ability of institutional investors to better utilize public information to choose their investments, it is possible that the presence of institutional investors is actually *causing* the better performance. That is, it is possible that institutional investors serve as monitors to the firms in which they invest, and that it is their monitoring that causes the return differential we observe. To examine this possibility, in Table 6 we look more closely at the composition of institutional investors.

First, we examine the returns of high minus low institutional ownership by institutional type. CDA Spectrum classifies institutional investors into five types: banks, insurance companies, mutual funds, independent investment advisors, and other, where "other" includes employee stock ownership programs (ESOPs), university endowments, foundations, and private and public pension funds.[17] Prior literature suggests that pension funds and perhaps mutual funds are most likely to take an active role in corporate governance (see, e.g., Del Guercio and Hawkins (1999), Parrino, Sias, and Starks (2003)). Accordingly, if monitoring is causing the better performance of firms with high institutional holdings, then we would expect these types of institutions to have the largest performance advantage. Consistent with the monitoring story, Panel A of Table 6 shows that the abnormal returns for our Q5 − Q1 portfolio are high and significant for mutual funds. However, the abnormal returns for the Q5 − Q1 portfolio are also significantly positive for independent investment advisors, yet independent investment advisors are not known to actively monitor. Also inconsistent with the monitoring story, there is no evidence that the "other" group (which includes pension funds) has significantly positive Q5 − Q1 abnormal returns.

[17] As noted by Chen et al. (2007), CDA's classifications are not accurate after 1998, as many of the Types 1 to 4 institutions are improperly classified as Type 5 (other) post-1998. As in Chen et al. (2007), we rely on CDA's classifications of each particular institution pre-1998, and we apply this classification after 1998.

TABLE 6

Performance by Different Types of Institutional Investors

The sample consists of 5,890 IPOs between 1980 and 2000. Table 6 shows weighted least squares regressions of monthly returns on the three Fama-French factors: the market return minus the risk-free rate (RMRF), returns on a portfolio of small firms minus returns on a portfolio of big firms (SMB), and returns on a high BM portfolio minus returns on a low BM portfolio (HML). Weights equal the number of IPOs each month. We use a fractional logit methodology to form the institutional ownership quintiles. Specifically, each year, we model the conditional mean of percent institutional ownership as a logistic function:

$$E(\text{INST}_{i,t}|x) = \frac{\exp(\beta_1 + \beta_2 * \text{PROCEEDS})}{[1 + \exp(\beta_1 + \beta_2 * \text{PROCEEDS})]}.$$

We calculate actual institutional ownership minus expected institutional ownership and use this measure for each firm to group firms into quintiles, where quintile 1 (Q1) represents firms with the lowest unexpected institutional ownership, and quintile 5 (Q5) represents firms with the highest unexpected institutional ownership. The dependent variables equal monthly returns on Q5 − Q1, for firms that have gone public within the past one quarter, one year, two years, and three years. Panel A breaks institutional investors into types, as defined by Thomson Financial's Spectrum 13F database. Panel B breaks institutional investors into dedicated, transient, and quasi-indexers, as in Bushee (1998). Panel C shows the fraction of firms in each institutional quintile with and without institutional 5% blockholders. Panel D shows the returns for Q5 − Q1 at various horizons for firms with a 5% institutional blockholder and for those with no institutional blockholder. The t-statistics are shown in parentheses, and ***, **, and * indicate significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Panel A. Returns for Q5 − Q1 for Various Institutional Types (as defined by Thomson Financial)

	Banks	Insurance Companies	Mutual Funds	Independent Investment Advisors	Other (includes pension funds)
One quarter	0.004	0.001	0.024***	0.016***	0.002
	(0.78)	(0.33)	(4.89)	(2.94)	(0.25)
1 year	0.003	0.0001	0.011***	0.012***	−0.008*
	(0.97)	(0.05)	(3.79)	(3.90)	(−1.81)
2 years	−0.001	−0.003	0.007***	0.008***	−0.004
	(−0.33)	(−1.17)	(2.79)	(2.80)	(−1.09)
3 years	−0.0002	−0.003	0.004*	0.004*	−0.002
	(−0.11)	(−1.60)	(1.92)	(1.39)	(−0.45)

Panel B. Returns for Q5 − Q1 for Dedicated, Transient, and Quasi-Indexers (as defined by Bushee (1998))

	Dedicated	Transient	Quasi-Indexers
One quarter	0.011*	0.016***	0.015***
	(2.01)	(2.57)	(2.88)
1 year	0.004	0.010***	0.006*
	(1.37)	(2.72)	(1.84)
2 years	0.0009	0.007**	0.006**
	(0.46)	(2.21)	(2.19)
3 years	0.001	0.004	0.004*
	(0.65)	(1.57)	(1.68)

Panel C. Fraction of Newly Public Firms With and Without a 5% Institutional Blockholder

	% Firms With Institutional Blockholder	% Firms Without Institutional Blockholder
Q1 (low)	5%	95%
Q2	17%	83%
Q3	23%	77%
Q4	31%	70%
Q5 (high)	43%	57%
Total	24%	76%

Panel D. Returns at Various Horizons of High Minus Low Institutional Ownership (Q5 − Q1) for Firms With and Without a 5% Institutional Blockholder

	At Least One 5% Institutional Blockholder		No Institutional Blockholders	
One quarter	−0.002	(−0.07)	0.018**	(2.57)
1 year	−0.001	(−0.11)	0.009**	(2.11)
2 years	−0.015	(−1.46)	0.009**	(2.44)
3 years	−0.004	(−0.62)	0.005	(1.61)

Chen et al. (2007) argue that those institutional investors whose style is to be long-term investors are more likely to be engaged in a monitoring role. Following Chen et al. (2007), we test this hypothesis using Bushee's (1998) classifications of institutional investors. Bushee (1998) classifies institutions into three groups: "transient" institutions, "dedicated" institutions, and "quasi-indexers." Contrary to the monitoring story, Panel B of Table 6 provides no evidence that dedicated institutions—those most likely to engage in monitoring activities—earn excess returns. By contrast, a portfolio of high minus low ownership by transient institutions—those least likely to engage in monitoring activities—does earn excess returns.[18]

To provide yet more insight into the potential monitoring role of institutional shareholders in newly public firms, we focus next on institutions with 5% blockholding (measured as a percentage of shares outstanding).[19] It has long been recognized that shareholders with larger equity positions have a greater incentive to monitor management than do atomistic shareholders, since the benefits large investors earn from their monitoring activities are more likely to exceed the costs they bear (Grossman and Hart (1986), Shleifer and Vishny (1986), Huddart (1993), and Parrino, Sias, and Starks (2003)).

Panel C of Table 6 shows that few newly public firms actually have institutional investors who own a 5% block. Across the whole sample, only 24% of firms have an institutional blockholder in place shortly after the IPO. By contrast, Chen et al. (2007) find that 64% of their sample of acquiring firms in 1981–2004 has institutional blockholders in place. The relatively low fraction of newly public firms with institutional blockholders argues against the notion of substantial monitoring by institutional shareholders. More importantly, Panel D shows that abnormal returns for firms *without* an institutional blockholder are actually higher than for firms *with* an institutional blockholder in place for horizons of up to two years.

In sum, the evidence provided in this section suggests that the superior returns earned by firms with greater institutional shareholdings is due to institutions' utilizing public information to choose their IPO investments, rather than any monitoring effect institutions may have on these firms' returns.

VI. How Does This Phenomenon Persist?

Results up to this point have shown that firms with the highest levels of institutional ownership significantly outperform those with the lowest levels, and this performance differential is driven by the poor performance of the latter group. A natural question is: Why isn't this underperformance arbitraged away?

[18] A portfolio of high minus low ownership by quasi-indexers also earns excess returns, although, as acknowledged by Chen et al. (2007), it is uncertain a priori whether quasi-indexers will attempt to perform monitoring functions.

[19] In the previous sections, we omitted institutions with more than 15% of the shares outstanding, on the presumption that such institutions may have owned their shares before the IPO (and that these shares, therefore, may be subject to lockup or Rule 144A restrictions). Here, our goal is to measure institutional monitoring, so we include institutions that own 15% or more of the shares outstanding for this analysis. Results in Panel D of Table 6 are qualitatively similar when we exclude these institutions.

Nagel's (2005) findings suggest that short-sale constraints may help explain our results. In fact, consistent with our findings, he argues that direct and indirect short-sale constraints allow only underperformance, but not overperformance, to persist. For stocks that are short-sale constrained, price efficiency depends on the actions of the existing shareholders of a stock because outside investors cannot sell it without going short. Although sophisticated investors would sell a stock if it became overpriced, if existing shareholders are not sufficiently sophisticated (and hence do not sell), the stock could become overpriced. In contrast, sophisticated investors can always buy underpriced stocks, an action that should push the price upwards. Thus, in the presence of short-sale constraints, we would observe underperformance but not overperformance. Indeed, that is precisely what we observe for IPOs.

This explanation obviously only holds if IPO stocks are short-sale constrained, a topic that has received considerable recent attention in the literature. Edwards and Hanley (2008) find that short selling occurs in 95% of their sample of IPOs, and they conclude that IPOs are not as short-sale constrained as has been commonly assumed in the literature (see, e.g., Hanley, Lee, and Seguin (1996), Derrien (2005), and Ljungqvist et al. (2006)). Moreover, Geczy, Musto, and Reed (2002) find that shorting costs are only 44 basis points per year for those newly public firms that are available to short, suggesting that shorting costs are not substantial, even for newly public firms.

However, the accessibility of shorting may not be equal across all firms, and, as noted by Edwards and Hanley (2008), the existence of short sales does not necessarily imply that short-sale constraints are unimportant. Nagel (2005) and D'Avolio (2002) suggest that the especially high shorting costs may be concentrated among those firms with low institutional investment, precisely the group of firms where we find the most severe underperformance. Stocks with low institutional ownership are probably more expensive to short because institutional investors are the main suppliers of stock loans. For firms with low institutional ownership, the loan supply is more likely to be sparse, which may result in the short seller having to pay a significant fee.

In sum, to the extent that the low institutional ownership stocks are both short-sale constrained and have a less sophisticated investor base (i.e., investors who are less likely to realize a stock is misvalued), perhaps it would not be surprising for those stocks to remain overvalued for extended periods of time. This would result in negative abnormal returns for long horizons following the IPO, which is exactly what we observe.

VII. Conclusion

Stocks with the highest levels of institutional ownership significantly outperform those with low institutional ownership. This performance differential is significant at horizons from one quarter to two years following the IPO. Moreover, in addition to being statistically significant, the difference is also economically significant: Firms with the highest levels of institutional ownership outperform those with the lowest levels by approximately 1% per month over a one-year period following the IPO. Our results indicate that the return differential we observe is due

to the ability of institutions to avoid the worst-performing firms: We observe that firms with the lowest levels of institutional investment significantly underperform.

These results raise the question: How are institutions able to identify and avoid the worst-performing firms? Do they have some proprietary advantage, such as private information, that individuals do not have access to? Is their advantage related to active monitoring of the firms in which they are invested? Or are institutions simply better able to use readily available public information, suggesting that individuals could similarly avoid the worst firms if they simply paid attention to firm- and offer-specific characteristics?

We find no evidence to suggest that institutions' superior performance results from monitoring activities. Moreover, our results provide little support for the idea that private information contributes substantially to institutions' ability to identify and avoid the worst-performing firms. Rather, our analysis suggests that the majority of the advantage institutions possess reflects their attention to publicly available information. Institutions are more likely to invest in the types of firms that tend to perform better, and they earn higher returns as a result. Individuals have access to the same information, but they appear to either disregard or misinterpret its relevance for firm value. This fundamental difference in the use of readily available public information is consistent with the findings of Odean (1998) and Barber and Odean (2008).

An examination of institutional ownership over time for firms with and without initial institutional presence provides additional evidence on individuals' investment returns. Although the typical firm with institutional investors after the IPO continues to attract more institutional investment, most firms lacking initial institutional interest fail to garner the interest of institutional investors even years later. Our results imply that it is individual investors who bear the brunt of IPO underperformance.

In sum, our results suggest that institutions use readily available public information to identify and avoid the worst-performing IPO stocks. In contrast, individuals appear to misunderstand the relevance of this information for firm value. It is puzzling why individuals continue to invest in these types of firms that perform so poorly. In fact, it is puzzling why these types of firms are able to go public at all.

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