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Why newly listed firms become acquisition targets

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ABSTRACT

We study the operating, financial, and ownership structure characteristics of newly listed firms which become acquisition targets shortly after their initial public offerings. We examine whether such firms get acquired because of their successful performance or as an alternative to delisting. We find that firms, which do relatively well in terms of operating as well as stock performance and attract institutional investor interest, draw the attention of acquirers. Furthermore, we observe that investments made by newly listed target firms do not destroy shareholder value and have comparable profitability to investments made by newly listed firms which grow by acquisitions. Overall, firms acquired shortly after listing are on a growth trajectory similar to that of surviving firms.

1. Introduction

Do firms become acquisition targets shortly after their initial public offering (IPO) because of the success they achieve after going public? Or, is it the failure of newly listed firms that increases the likelihood of getting acquired? Whether getting acquired soon after going public is indicative of failure or success is an unexamined empirical issue in the literature.

Recent academic literature finds that hot IPO periods and merger waves are correlated (Rau and Stouraitis, 2011). Hsieh et al. (2011) propose a theoretical model that links a firm's decision to go public with its subsequent strategy of growth by acquiring other firms. In related research, Celikyurt et al. (2010) report that IPO firms become prolific acquirers shortly after going public. In contrast, we focus on why newly listed firms become acquisition targets. Our research provides additional insights into the correlation between hot IPO periods and merger waves.

One rationale for why IPO firms become acquisition targets is that a private firm may go public only to ascertain its potential value prior to eventually selling out to a prospective bidder (Zingales, 1995). However, IPO firms may become acquisition targets in the wake of looming bankruptcy as well. While the literature examines factors affecting survival of firms following an IPO (Hensler et al., 1997; Tsoukas, 2011), a comprehensive analysis of reasons explaining why recent IPOs get acquired has received limited attention. Closest to our research is the study by Jain and Kini (1999) who document the effect of *pre-IPO* characteristics on the probability of an IPO firm delisting, surviving, or becoming an acquisition target. Unlike the prior literature, we study the effect of *post-IPO* characteristics on the fate of IPO firms and explore whether acquisition of a newly listed firm occurs due to the IPO firm's growth and otherwise successful performance, or as an alternative to delisting attributable to negative outcomes such as impending bankruptcy or violation of exchange regulations. We further analyze the variations in characteristics of firms which become targets soon after an IPO and, to determine the predominant characteristics of these firms, contrast them to three distinct control groups of IPO firms which (a) remain independent and acquire other firms, (b) remain independent and grow organically, and (c) fail and get delisted. If becoming an acquisition target shortly after the IPO is due to the firm's success, the target firm's characteristics should be superior to those of firms which have gone bankrupt and comparable to firms which survive.

We find that IPO targets, when compared to firms that delist due to bankruptcy, are stronger performers and are able to attract higher institutional following. Problems emanating from reliance on short-term debt and a possible liquidity shock do not appear to play a significant role in determining which firms get acquired.

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In terms of operating performance, IPO targets resemble firms that survive following their IPOs and remain listed for over 3 years. These conclusions stand up to additional tests for robustness. With regard to the profitability of investments made after going public, IPO targets are no different from IPO firms that grow by acquisitions. Based on these results, IPO targets are on a growth path akin to that of surviving firms and are not on a declining trajectory prior to being acquired.

Our research makes several contributions. First, we document that a non-trivial number of firms are acquired shortly after their IPOs. This indicates that newly listed firms contribute to the previously empirically-observed link between IPO and merger waves (Rau and Stouraitis, 2011) not only in the role of acquirers (Celikyurt et al., 2010; Hsieh et al., 2011) but also as targets. Second, we address the success-failure dichotomy with regard to targets and demonstrate that target firms are comparable to surviving firms in terms of operating characteristics. Third, we document that operating characteristics, stock performance, and institutional ownership of newly listed firms are important attributes related to the likelihood of the firm getting acquired shortly after its IPO. Finally, we show that target IPO firms make investment decisions of comparable profitability to those of IPO firms which grow by acquisition and are not destroying shareholder wealth by their post-IPO investment decisions.

The remainder of the paper is organized as follows: Section 2 develops the analytical framework adopted for the study. Section 3 describes the sample and presents the empirical results. In Section 4 we perform robustness analysis. Section 5 concludes.

2. Analytical framework

We stratify the sample into four distinct groups: the sample of IPO firms that become targets and three other control groups. We then compare and contrast the characteristics of the IPO target group with those of the three control groups to isolate the predominant characteristics of IPO firms that eventually become targets.

2.1. Control groups

After listing their shares via IPO, firms may encounter a multitude of fates, which we broadly classify into four distinct categories. First, recent IPO firms may get delisted as a result of becoming targets of acquisitions. We refer to these firms as "Targets" or "IPO Targets". Second, newly-listed firms may post declining overall performance after going public and get delisted due to violation of listing requirements of exchanges or due to outright bankruptcy. We refer to these firms as "Delisted" or "Delisted IPOs". Third, newly listed firms could pursue a path of growth via acquisitions and become acquirers while remaining independent. We call such firms "Acquirers" or "IPO Acquirers". Finally, firms may grow organically (i.e. without engaging in acquisitions), managing to maintain or even accelerate the pre-IPO rate of growth after going public. We refer to these firms as "Other" or "Other IPOs". We impose a 3 year window on measuring the outcome experienced by the firms. The object of our study is to identify the defining characteristics of the IPO Targets vis-à-vis these three groups of firms.

Delisting due to poor post-IPO performance or eventual bankruptcy shortly after going public results in destruction of shareholder wealth and usually connotes failure. Similarly, takeover of IPO firms after they go public might be symbolic of the fact that the managers of the newly listed firm fail to effectively manage the assets of the firm. For example, an acquisition of a recently listed firm may be characterized as a failure if such acquisition occurs due to a shock to its financial liquidity leading to a fire sale of the whole company (Shleifer and Vishny, 1992; Pulvino, 1998; Ang and Mauck, 2011). However, being acquired by another firm need not necessarily be symptomatic of a negative outcome and may indeed denote a successful event for the firm and its shareholders. Acquisition of a newly public firm may occur at higher valuation than if the firm were to be acquired when private.[1]

Survival is a natural and necessary condition for continued growth and profitability. The literature studying survival of firms generally uses one aggregate sample of surviving firms as a control group (for example, Farinha and Santos, 2006; Hensler et al., 1997; Jain and Kini, 1999; Tsoukas, 2011). But newly listed firms can grow either organically or by acquiring other firms. We consider these two variants of growth strategies because there are fundamental differences between the two classes of firms. Celikyurt et al. (2010) and Hovakimian and Hutton (2010) report that IPO firms are prolific acquirers. Higher rate of acquisitions likely fuels higher growth rates and presumably leads to larger firm size. Therefore, it is reasonable to posit that IPO firms engaged in acquisitions are larger and grow more rapidly than IPO firms which grow organically. To the extent that size and rate of growth are indicators of success, IPO firms engaged in acquisitions can be classified as the most successful, followed by firms that grow organically.[2] If IPO firms become targets because of their successful performance, their characteristics should be closer to those firms that survive. Also, the comparability of IPO Targets and IPO Acquirers on any dimension would reinforce and further support the hypothesis that IPO Targets reflect on average successful performance.

2.2. Firm-specific characteristics and development of hypotheses

We analyze standard firm-specific characteristics across four subsamples of firms investigated in this study. These characteristics and their associations with success/failure of firms enable us to ascertain the success or failure of IPO Targets. We then describe the variables used, explain how they relate to the questions explored in this study, and state the hypotheses.

First, post-IPO operating performance is measured by earnings before taxes, depreciation and amortization to total assets. To estimate the extent of cash usage by the firm we calculate the ratio of the EBITDA to cash and define an indicator variable *Low Cash Burn Firm* set equal to zero if this ratio falls into the bottom third of the in-sample distribution and to one otherwise. If a firm's success increases its attractiveness as an acquisition target, higher *EBITDA/Total Assets* and low cash burn rates would be associated with firms that do indeed become acquisition targets. We propose the following hypothesis with respect to operating performance:

H1. (Operating performance hypothesis) If acquisitions of IPO firms reflect their post-IPO success, IPO Targets' operating performance, as measured by *EBITDA/Total Assets* and *Low Cash Burn Firm* indicator, is:

a. stronger than the operating performance of Delisted IPOs
b. comparable to the operating performance of Other IPOs and IPO Acquirers.

[1] Chang (1998) and Fuller et al. (2002) document that announcement returns are significantly higher for acquirers of private versus public targets. Officer (2007) argues that lower financial liquidity of private versus public firms' explains the discount at which private firms are acquired.

[2] Even though all acquisitions of prolific acquirers need not always increase shareholder wealth, we are assuming that those firms which grow by acquisitions are more successful than firms which grow organically. In support of our assumption we note that the announcement returns to IPO Acquirers are on average significantly positive.

Second, growth opportunities of the firms should be positively related to the likelihood of IPO firms becoming targets, if acquirers do indeed purchase firms which are successful or have the potential to be successful. Growth opportunities are measured by *Q* which is defined as the sum of total liabilities and market value of equity divided by total assets. We propose and test the following hypothesis:

H2. (Growth opportunities hypothesis) If acquisitions of IPO firms reflect their post-IPO success, IPO Targets' growth opportunities, as measured by *Q*, are:

a. Higher than the growth opportunities of Delisted IPOs.
b. Comparable to the growth opportunities of Other IPOs and IPO Acquirers.

Third, we hypothesize that the profitability of post-IPO investments should affect the success of the newly listed firms. We therefore study the investment behavior of firms as measured by research and development (R&D) spending and capital expenditures, both scaled by total assets. Firms performing poorly may rationally choose to limit their investment in order to conserve cash. However, it is also possible that poorly performing firms may be performing sub-par only because they invested heavily in low return projects. Therefore, the effect of R&D and capital expenditures on firm performance is an empirical issue. We investigate one other particular investment decision by IPO firms: acquisitions of other firms. Some IPO Targets in our sample also acquire other firms prior to becoming targets themselves. We explore the impact such acquisitions have on shareholder wealth by comparing the acquisition announcement returns of IPO Targets to those of IPO Acquirers to analyze whether acquisitions undertaken by IPO Targets create or destroy shareholder wealth. Specifically, we posit the following hypothesis:

H3. (Profitability of investments hypothesis) If acquisitions of IPO firms reflect their post-IPO success, IPO Targets' profitability of investments, as measured by the impact such acquisitions have on shareholder wealth around the announcement of acquisitions, is comparable to the profitability of IPO Acquirers' investments.

Fourth, high leverage, especially high reliance on short-term debt, puts firms under considerable pressure to find additional funds to support growth or in the limit to avoid ultimate bankruptcy. Therefore, low reliance on short-term debt by IPO targets would indicate financial slack and a decreased likelihood of fire sale, while high reliance on short-term debt would suggest that acquisitions of IPO firms may have been instigated by financial distress attributable to the inability of IPO firms to rollover short-term debt after going public. For completeness, we also consider long term debt to assets. We propose and test the hypothesis below:

H4. (Financial slack hypothesis) If acquisitions of IPO firms reflect their post-IPO success, IPO Target's reliance on short-term external financing, as measured by the ratio of short-term debt to total assets, is:

a. Lower than the reliance on short-term external financing of Delisted IPOs.
b. Comparable to the short-term external financing of Other IPOs and IPO Acquirers.

Fifth, post-IPO stock price performance of firms is measured as the market-adjusted buy-and-hold return since IPO (*BHAR since IPO*) and *Excess Return (1 Year)*. We measure *BHAR since IPO* as the buy-and-hold return of the IPO firm less the buy-and-hold return on the CRSP equal-weighted index starting the month immediately after the IPO ($t = IPO$) through the relevant month for each subsample ($t = T$), i.e. the month preceding the acquisition announcement date for IPO Targets, delisting date for Delisted IPOs, or through the fiscal year-end in the year of the measurement for Other IPOs and Acquirers. Specifically, the calculation for a firm i is:

$$BHAR_i = \prod_{t=IPO}^{T}(1 + R_{i,t}) - \prod_{t=IPO}^{T}(1 + R_{Market,t}) \quad (1)$$

Excess Return (1 Year) is the sum of monthly returns in excess of the CRSP equal-weighted index for the year preceding the relevant date (as defined in the previous paragraph) for each subsample. Specifically, the calculation for a firm i follows the equation below:

$$Excess\ Return\ (1\ Year)_i = \sum_{t=T-12}^{T-1}(R_{i,t} - R_{Market,t}) \quad (2)$$

We focus on these two overlapping time periods to assess whether it is the overall performance since the IPO or a more recent stock price change that affects the prospects of IPO firms. Firms which have superior market valuation are more likely to become acquisition targets if acquirers seek out successful targets. We test the following hypothesis:

H5. (Stock performance hypothesis) If acquisitions of IPO firms reflect their post-IPO success, IPO Targets' stock performance is:

a. higher than the stock performance of Delisted IPOs.
b. comparable to the stock performance of Other IPOs and IPO Acquirers.

Finally, we study the importance of institutional following for firms' survival. Helwege et al. (2007) document that following an IPO, firms with high valuations, strong recent stock market performance, and liquid stocks attract wide institutional ownership. Bharath and Dittmar (2010) and Mehran and Peristiani (2010) find that firms that failed to attract a critical mass of visibility by way of institutional investors interest abandon their public listing and are more likely to go private. Clearly, the ability to attract institutional investors is an indicator of post-IPO success. We measure *Total Institutional Ownership* as the total number of shares owned by institutions divided by total number of shares outstanding. We also use an alternative measure of institutional following, namely *Number of Institutional Owners,* which measures the number of institutions holding firm's shares on the date of measurement. To the extent that acquirers seek out successful IPO firms, newly listed firms with substantive increases in their institutional following should be more likely to become acquisition targets. Specifically, we propose and test the following hypothesis:

H6. (Institutional interest hypothesis) If acquisitions of IPO firms reflect their post-IPO success, IPO Targets' institutional following is:

a. Higher than the institutional following of Delisted IPOs.
b. Comparable to the institutional following of Other IPOs and IPO Acquirers.

3. Sample description and empirical results

3.1. Sample description

We compile a sample of completed U.S. IPOs between 1980 and 2006 from the Securities Data Corporation (SDC) New Issues database. We exclude IPOs with offer price less than $5 or missing, unit offerings, spinoffs, closed end funds, American depositary receipts, and real estate investment trusts. Next we use the SDC Mergers & Acquisitions database as well as CRSP delisting codes to identify the four distinct groups of firms within that sample: Targets, Delisted, Other, and Acquirers. With respect to identifying acquisitions made by recent IPO firms, we exclude acquisitions with deal value smaller than $1 million or acquisitions of less than 50% of target equity.

The distribution of our sample between these three groups is reported in Table 1 Panel A. There are a total of 6076 IPOs in our sample. 932 firms get acquired within 3 years of their IPOs (Targets), 2194 firms make at least one acquisition in the 3 years following their IPOs and remain publicly traded (Acquirers), 2490 firms remain independent and do not engage in acquisitions (Other), and 460 firms get delisted within 3 years of their IPOs (Delisted). IPO firms classified as Acquirers account for 36% of the entire sample of U.S. IPOs. This is consistent with the findings of Celikyurt et al. (2010). Targets comprise approximately 15% of all (similar) U.S. IPOs between 1980 and 2006. Other IPOs and Delisted IPOs account for 41% and 8% of the sample, respectively.

As Panel B Table 1 shows, the trends of the four subsamples of IPOs follow, in general, similar patterns. In unreported results, we note that the correlation between the time series for IPO Targets versus Delisted IPOs, Other IPOs, and IPO Acquirers are 0.94, 0.88, and 0.60, respectively. In Panel C of Table 1 we provide the distribution of the firms in each of the four subsamples across the 49 Fama-French industries.

3.2. Time-matching algorithm and sample characteristics

In our analysis we compare and contrast firm-specific characteristics of various subsamples. However, the length of time a firm is listed may have an important effect on some characteristics of the firms in our sample. As IPO firms get acquired 1, 2, or 3 years after going public and surviving firms have data for all these years, it is critical that we measure and match the data for IPO Targets with those of Other IPOs and Acquirers appropriately. For example, if an IPO firm gets acquired 1 year, i.e. within 365 calendar days after the date of the IPO, its characteristics should be compared with a surviving IPO firm's characteristics measured around its first year listing anniversary. We therefore implement a time-matching algorithm for firms that got acquired 1, 2, or 3 years after their listing using the following steps. First, we note that out of the 932 IPO Targets, 84 (9.01%) get acquired in the first year after listing, 403 (43.24%) in the second year, and 445 (47.75%) in the third year. Second, we randomly assign 9.01%, 43.24%, and 47.75% of IPO Acquirers into three distinct groups and then measure the relevant characteristics for the first, the second, and the third group 1, 2, and 3 years after the IPO, respectively. This results in a time-matched sample of Acquirer IPOs for which the length of time of listing has the same distribution as that for the sample of IPO Targets. Third, we follow the same time-matching algorithm for Other IPOs.[3]

Table 2 reports the characteristics of Targets compared to Delisted, Other, and Acquirers in a univariate setting. Prior literature documents that firms with small IPO offerings are more speculative and face higher likelihood of bankruptcy (Ritter, 1991; Loughran and Ritter, 1995). When compared to Delisted and Other IPOs, Targets are larger firms in terms of total assets and realize higher IPO proceeds. IPO Targets report intangible assets that are similar to those reported by Delisted IPOs. The intangible assets for both Delisted IPOs and IPO Targets are within the levels of intangible assets reported by Other IPOs and IPO Acquirers. While Targets are similar to Other IPOs and Acquirers with respect to age at the time of the IPO as well as with respect to having venture capital ("VC") backing,[4] they are significantly older and more likely to have VC backing than Delisted IPOs.[5]

We also collect information on the lead IPO underwriter from SDC and identify underwriter's ranking based on Loughran and Ritter (2004).[6] In our sample, 64% of IPO Targets retain highly reputable underwriters when going public. This is significantly higher than the corresponding percentages for Delisted IPOs, Other IPOs, and IPO Acquirers.

Brau et al. (2003) find that "hotness" of the IPO market increases the likelihood of a private firm pursuing an IPO in lieu of an acquisition. We examine the effects of hot and cold IPO markets at the time of a firm's IPO. We define hot and cold IPO markets based on the monthly volume of IPO issuance as in Helwege and Lian (2004). Approximately 53% of IPO Targets versus 56%, 49%, and 48% of Delisted, Other IPOs, and IPO Acquirers, respectively, went public during hot IPO periods. The difference between IPO Targets and IPO Acquirers is statistically significant at the 0.01 level. IPO Targets are significantly less likely to go public during cold IPO periods than are Other IPOs and IPO Acquirers, although the economic significance does not appear large (0.09 versus 0.11).

We also consider the effect of intensity of corporate asset transactions within an industry. Following Schlingemann et al. (2002), we construct a measure of *Industry Asset Liquidity* by first summing the values of corporate control transactions reported by SDC at a particular two-digit SIC code each year. Corporate control transactions include all completed leveraged buyouts, tender offers, spinoffs, exchange offers, minority ownership purchases, acquisitions of remaining interest, privatizations, and equity carve-outs. Next, we calculate the ratio of corporate control transactions in a particular year to the book value of total assets for firms in the two-digit SIC industry with data available for that year on Compustat. Schlingemann et al. (2002) exclude observations with fewer than ten firms in the industry and ratios larger than one and we do the same. We note that IPO Targets and Delisted IPOs go public during times of heightened *Industry Asset Liquidity*.

[3] Note that for Delisted IPOs we use the date of delisting. 0.65%, 41.30%, and 58.04% of firms delist in the first, second, and third year after their IPOs, hence, fewer firms delist shortly after their IPOs, with a typical firm delisting in the third year after an IPO. Therefore, when comparing IPO Targets and Delisted IPOs, our results should be biased toward insignificance, *ceteris paribus*.

[4] Data on age of firms at the time of the IPO is obtained from Prof. Ritter's website. Data on VC backing is obtained from SDC.

[5] In unreported results, we also analyze the effect of ownership structure of the IPO firms on our results. Specifically, following Helwege et al. (2007), we use Compact Disclosure to collect data on insider ownership (i.e. ownership reported by officers and directors of the firm) at the time of the IPO. We obtain data from Compact Disclosure starting in 1987 through 2004. We identify data for 2094 IPO firms in our sample. Given the large proportion of observations for which Compact Disclosure does not contain insider ownership data, we do not include this variable in our main analysis. However, we do perform our analyses on a subset of firms with available insider ownership data and discuss the findings. The univariate results indicate that IPO Targets are characterized by an average insider ownership of 29.26% which is significantly higher than the average insider ownership of 24.31% and 25.90% for Other IPOs and Acquirers, respectively. Delisted IPOs have an average insider ownership of 26.77%.

[6] Loughran and Ritter's (2004) underwriter ranking follows Carter and Manaster (1990) and Carter et al. (1998). Ranks of underwriters, on a scale from 0 to 9, are derived from the order observed on tombstone advertisements. We consider an IPO underwriter to be highly reputable if its score is 9, the highest ranking possible. Data on Prof. Ritter's website updates the rankings through end of our sample period.

Table 1
Total IPOs contains all IPOs between 1980 and 2006 from SDC and excludes unit offerings, issues with stock price lower than $5 or missing, spinoffs, ADRs, real estate investment trusts, closed end funds, and firms without available data on CRSP and Compustat. *Delisted* denotes firms that delisted within 3 years of their IPO. *Targets* comprises firms that became targets of an acquisition within 3 years of their IPOs. *Acquirers* comprises firms that made at least one acquisition within 3 years of their IPOs. Firms that make an acquisition and subsequently become a target or get delisted are marked as *Targets* or *Delisted*, respectively. *Other* contains remaining IPOs (i.e. it excludes IPOs already present in the *Delisted, Targets*, and *Acquirers* samples). In Panels B and C, the percent of the subsample IPOs is based on the number of IPOs in the relevant year.

Panel A	*N*	% of Total IPOs (%)
Total IPOs	6076	100.0
Firms that within 3 years of their IPOs became:		
Delisted	460	7.6
Targets	932	15.3
Acquirers	2194	36.1
Other	2490	41.0

IPO Year	Delisted		Targets		Acquirers		Other	
Panel B								
1980	2	3.8%	3	5.8%	9	17.3%	38	73.1%
1981	4	2.8%	8	5.6%	47	33.1%	83	58.5%
1982	8	13.6%	7	11.9%	16	27.1%	28	47.5%
1983	21	6.3%	32	9.5%	86	25.6%	197	58.6%
1984	10	7.4%	18	13.3%	24	17.8%	83	61.5%
1985	10	6.5%	26	17.0%	21	13.7%	96	62.7%
1986	21	6.8%	39	12.7%	69	22.5%	178	58.0%
1987	12	5.2%	39	17.0%	49	21.4%	129	56.3%
1988	7	8.1%	5	5.8%	20	23.3%	54	62.8%
1989	3	3.2%	10	10.5%	42	44.2%	40	42.1%
1990	5	5.9%	6	7.1%	42	49.4%	32	37.6%
1991	8	3.5%	15	6.5%	101	43.7%	107	46.3%
1992	12	3.5%	41	12.1%	140	41.2%	147	43.2%
1993	21	4.4%	63	13.2%	205	43.0%	188	39.4%
1994	21	5.5%	51	13.2%	156	40.5%	157	40.8%
1995	32	8.9%	75	20.8%	145	40.2%	109	30.2%
1996	73	12.9%	121	21.3%	204	36.0%	169	29.8%
1997	47	11.7%	83	20.6%	160	39.8%	112	27.9%
1998	28	11.1%	37	14.7%	120	47.6%	67	26.6%
1999	56	14.4%	88	22.6%	167	42.9%	78	20.1%
2000	31	10.3%	62	20.7%	111	37.0%	96	32.0%
2001	3	4.8%	11	17.5%	29	46.0%	20	31.7%
2002	2	2.9%	10	14.3%	25	35.7%	33	47.1%
2003	2	3.2%	6	9.7%	27	43.5%	27	43.5%
2004	3	1.6%	33	17.9%	63	34.2%	85	46.2%
2005	4	2.5%	25	15.7%	66	41.5%	64	40.3%
2006	14	9.0%	18	11.6%	50	32.3%	73	47.1%
Total	460	7.6%	932	15.3%	2194	36.1%	2490	41.0%

Fama-French Industry Groups	Delisted		Targets		Acquirers		Other	
Panel C								
1. Agriculture	0	0.0%	3	13.0%	13	56.5%	7	30.4%
2. Food Products	4	6.7%	10	16.7%	17	28.3%	29	48.3%
3. Candy and Soda	0	0.0%	1	20.0%	2	40.0%	2	40.0%
4. Beer and Liquor	2	14.3%	4	28.6%	2	14.3%	6	42.9%
5. Tobacco Products	2	50.0%	1	25.0%	0	0.0%	1	25.0%
6. Recreation	8	17.8%	3	6.7%	13	28.9%	21	46.7%
7. Entertainment	10	9.3%	16	14.8%	40	37.0%	42	38.9%
8. Printing and Publishing	1	3.6%	7	25.0%	11	39.3%	9	32.1%
9. Consumer Goods	8	11.3%	6	8.5%	20	28.2%	37	52.1%
10. Apparel	5	6.5%	5	6.5%	19	24.7%	48	62.3%
11. Healthcare	11	7.3%	36	24.0%	80	53.3%	23	15.3%
12. Medical Equipment	14	5.8%	45	18.7%	55	22.8%	127	52.7%
13. Pharmaceutical Products	7	2.1%	30	9.0%	61	18.2%	237	70.7%
14. Chemicals	5	8.5%	7	11.9%	15	25.4%	32	54.2%
15. Rubber and Plastic Products	5	11.1%	4	8.9%	16	35.6%	20	44.4%
16. Textiles	2	5.4%	4	10.8%	13	35.1%	18	48.6%
17. Construction Materials	1	1.6%	8	12.5%	25	39.1%	30	46.9%
18. Construction	10	15.2%	8	12.1%	21	31.8%	27	40.9%
19. SteelWorks	1	1.7%	8	13.6%	11	18.6%	39	66.1%
20. Fabricated Products	1	7.7%	1	7.7%	5	38.5%	6	46.2%
21. Machinery	6	4.8%	17	13.6%	37	29.6%	65	52.0%
22. Electrical Equipment	1	5.3%	1	5.3%	6	31.6%	11	57.9%
23. Automobiles and Trucks	3	5.3%	11	19.3%	28	49.1%	15	26.3%
24. Aircraft	0	0.0%	5	33.3%	6	40.0%	4	26.7%
25. Shipbuilding, Railroad Equipment	1	9.1%	1	9.1%	4	36.4%	5	45.5%
26. Defense	1	16.7%	0	0.0%	1	16.7%	4	66.7%
27. Precious Metals	0	0.0%	2	25.0%	0	0.0%	6	75.0%
28. Non-Metallic and Indstr'l Metal Mining	1	11.1%	0	0.0%	3	33.3%	5	55.6%

Table 1 (*continued*)

Fama-French Industry Groups	Delisted		Targets		Acquirers		Other	
29. Coal	0	0.0%	0	0.0%	2	28.6%	5	71.4%
30. Petroleum and Natural Gas	7	5.0%	25	17.7%	56	39.7%	53	37.6%
31. Utilities	0	0.0%	4	19.0%	9	42.9%	8	38.1%
32. Communication	20	9.2%	45	20.7%	99	45.6%	53	24.4%
33. Personal Services	7	8.3%	11	13.1%	44	52.4%	22	26.2%
34. Business Services	31	8.2%	67	17.7%	156	41.2%	125	33.0%
35. Computers	25	7.8%	40	12.5%	111	34.7%	144	45.0%
36. Computer Software	87	10.4%	189	22.6%	375	44.7%	187	22.3%
37. Electronic Equipment	20	5.5%	39	10.7%	115	31.5%	191	52.3%
38. Measuring and Control Equipment	3	2.4%	19	15.2%	40	32.0%	63	50.4%
39. Business Supplies	3	8.3%	4	11.1%	17	47.2%	12	33.3%
40. Shipping Containers	1	5.3%	3	15.8%	8	42.1%	7	36.8%
41. Transportation	15	9.9%	13	8.6%	51	33.6%	73	48.0%
42. Wholesale	18	9.0%	30	15.0%	101	50.5%	51	25.5%
43. Retail	36	9.2%	53	13.5%	113	28.8%	191	48.6%
44. Restaraunts, Hotels, Motels	16	11.9%	17	12.6%	41	30.4%	61	45.2%
45. Banking	22	9.1%	47	19.5%	75	31.1%	97	40.2%
46. Insurance	5	2.6%	31	16.3%	65	34.2%	89	46.8%
47. Real Estate	1	3.6%	9	32.1%	10	35.7%	8	28.6%
48. Trading	17	5.5%	37	11.9%	127	41.0%	129	41.6%
49.Other	16	13.2%	5	4.1%	55	45.5%	45	37.2%
Total	460	7.6%	932	15.3%	2194	36.1%	2490	41.0%

3.3. Univariate results

Next we analyze our hypotheses in univariate setting, and report the results in Table 2. First, we consider the operating performance of sample firms. The *EBITDA/Total Assets* ratio for Targets, Delisted, Other, and Acquirers is on average 2.74%, −30.23%, −0.99%, and 6.17%, respectively. Results in Fig. 1, showing the *EBITDA/Total Assets* for each of the first 3 years for each subsample, indicate that with respect to operating profitability, Targets evolve in a fashion similar to that of Acquirers. The typical firm, whether Target or Acquirer, is profitable in each of the 3 years, with profitability declining over time. Table 2 also shows that the Target sample includes significantly higher proportion of firms that are classified as *Low Cash Burn Firms* when compared to Delisted IPOs. IPO Acquirers on the other hand have the highest proportion of *Low Cash Burn Firms*. Target and Other IPOs are similar with respect to cash burn rates. Thus, when we consider operating performance, target firms are stronger performers than delisted firms and are more comparable to surviving firms, especially to firms that grow organically after their IPOs. These findings are consistent with the operating performance hypothesis.

Considering growth opportunities, IPO Targets' average and median *Q* is not statistically distinguishable from the *Q* of any of the three subsamples. Fig. 2 shows that all firms record a decline in *Q* from year one to year two relative to the IPO. With the exception of Other IPOs, growth opportunities exhibit a downward trajectory during the 3-year period following the IPO. Therefore, the univariate results are inconsistent with the growth opportunities hypothesis.

With respect to investment in R&D and capital expenditures, IPO Targets are comparable to Acquirers, even though they expend significantly less in R&D and capital expenditures than Other and Delisted IPOs. Delisted IPOs make the highest investment in R&D and capital expenditures among the four subsamples. As is typical, the median firm in all of the four subsamples has no (zero) R&D expenditures (medians are therefore omitted from the table). Our results corroborate the profitability of investments hypothesis to the extent that non-merger related investments of IPO Targets are similar to those of Acquirers. We consider the profitability of merger-related investments later in the paper.

The reliance of IPO Targets, Other IPOs, and IPO Acquirers on short-term debt is similar, while Delisted IPOs exhibit significantly higher reliance on short-term debt. There are generally smaller differences in the use of long-term debt between Targets and the three subsamples, with IPO Acquirers showing significantly higher reliance on long-term debt than IPO Targets. It is plausible that IPO Acquirers have a long-term strategy for their acquisitions and strive to have in place long-term financing to fund their acquisitions. Fig. 3 shows similar patterns for leverage for Targets and Acquirers in years one, two, and three, and increased reliance on short-term debt by delisted firms. These findings are consistent with the financial slack hypothesis.

Now we turn to the post-IPO stock price performance of firms. On average, Targets perform significantly worse than Acquirers since the IPO date and during the last year prior to the measurement date. However, the differences in medians are not statistically significant for either *BHAR since IPO* or *Excess Return (1 Year)*. When compared to Other IPOs, the average and median *BHAR since IPO* for Targets are both significantly higher, whereas Target and Other IPOs post similar stock price performance in the year prior to the measurement date. Finally, Targets outperform Delisted IPOs regardless of the stock return measure used. The results support the stock performance hypothesis.

Table 2 also shows that institutions own on average 31.7% of IPO Targets' shares while they own 11.2%, 29.3%, and 40% of Delisted, Other IPOs, and Acquirers, respectively. The differences between Targets and all three benchmark samples are statistically significant at better than 0.05 level. Using *Number of Institutional Owners*, we arrive at results consistent with the level of institutional ownership. Fig. 4 indicates that Targets are able to increase institutional following after going public and resemble Acquirers in terms of the upward trend. Other IPOs experience the highest increases in institutional ownership over time. Based on our univariate analysis for a sample of recent IPOs, lack of institutional interest does increase the likelihood of newly listed firms getting delisted, a result consistent with the institutional interest hypothesis. We note that past research shows positive relation between institutional ownership of IPO firms and their past performance (Helwege et al., 2007; Field and Lowry, 2009). Therefore, in our regression analysis, we control for the informational overlap between the firm's performance and institutional ownership variables.

Overall, based on the univariate results, we find evidence indicating that IPO Targets outperform Delisted IPOs and exhibit oper-

Table 2
Sample characteristics.

		Targets	Delisted	Other	Acquirers
Total Assets (millions)	*Ave*	701.74	249.10***	398.92**	1389.68**
	Med	97.02	27.56***	65.16***	135.75***
IPO Proceeds (millions)	*Ave*	90.38	42.76***	62.74***	97.91
	Med	37.80	14.00***	25.00***	37.50
Intangible Assets/Total Assets	*Ave*	9.53%	9.50%	3.54%***	11.71%***
	Med	0.00%	0.00%	0.00%***	2.28%***
Age at IPO	*Ave*	16.02	7.26***	16.03	16.40
	Med	8.00	4.00***	8.00	8.00
VC Backed	*Ave*	0.40	0.28***	0.37	0.38
High Rank Underwriter	*Ave*	0.64	0.31***	0.49***	0.58***
Hot IPO Market	*Ave*	0.53	0.56	0.49**	0.48***
Cold IPO Market	*Ave*	0.09	0.07	0.11**	0.11**
Industry Asset Liquidity	*Ave*	2.61%	2.66%	1.85%***	2.04%***
	Med	1.15%	1.13%	0.81%***	0.86%***
EBITDA/Total Assets	*Ave*	2.74%	−30.23%***	−0.99%***	6.17%***
	Med	9.35%	−15.24%***	7.99%*	10.74%***
Low Cash Burn Firm	*Ave*	0.70	0.33***	0.68	0.77***
Q	*Ave*	2.65	2.50	2.45	2.43
	Med	1.67	1.58	1.63	1.63
R&D/Total Assets	*Ave*	5.61%	9.00%***	8.55%***	5.34%
Capex/Total Assets	*Ave*	7.58%	10.86%***	8.24%*	7.33%
	Med	4.35%	6.05%***	4.90%**	4.56%
Short-Term Debt/Total Assets	*Ave*	29.11%	37.37%***	29.62%	28.38%
	Med	23.44%	29.22%***	24.02%	23.30%
Long-Term Debt/Total Assets	*Ave*	16.33%	16.77%	14.73%*	18.01%*
	Med	4.71%	4.19%	4.57%	8.30%***
BHAR since IPO	*Ave*	−10.69%	−78.20%***	−19.96%**	3.57%***
	Med	−26.87%	−86.92%***	−42.17%***	−29.43%
Excess Return (1 Year)	*Ave*	−9.16%	−62.56%***	−7.02%	−4.12%**
	Med	−15.90%	−73.28%***	−18.40%	−15.05%
Total Institutional Ownership	*Ave*	31.66%	11.23%***	29.25%**	39.99%***
	Med	24.43%	4.64%***	20.51%***	33.62%***
Number of Institutional Owners	*Ave*	33.85	10.65***	27.65***	43.68***
	Med	21.00	4.00***	14.00***	27.00***

This table reports the test of means and medians of IPO Targets versus Delisted IPOs, Other IPOs, and IPO Acquirers. Sample is described in Table 1. Accounting, stock return, and institutional ownership variables are as of the fiscal year end prior to the relevant date. The relevant day for IPO Targets is the acquisition announcement and for Delisted IPOs the date of delisting. For Other IPOs and IPO Acquirers, the relevant date is based on an algorithm that randomly assigns firms into three groups (year 1–3) based on the distribution of acquisitions of IPO Targets, as described in Section 3.2. Accounting data is obtained from Compustat. *Total Assets* is total assets. *IPO Proceeds* is as reported by SDC (all proceeds all markets). *Age at IPO* is the number of years that the firm has been founded at the time of the IPO; data obtained from Prof. Ritter's website. *Intangible Assets/Total Assets* is set equal to zero if missing. *VC Backed* is an indicator variable set equal to one if SDC reports that the IPO had backing by venture capital firms and zero otherwise. *High Rank Underwriter* is an indicator variable if the lead IPO underwriter is identified as high rank. We obtain data on IPO underwriter ranking from Loughran and Ritter (2004) as updated on Prof. Ritter's website. Loughran and Ritter (2004) rank underwriters on a scale from 0 to 9, based on the order observed on tombstone advertisements. We consider an underwriter to be highly reputable if its score is 9 at the time of the IPO, i.e. the highest ranking possible. *Hot/Cold IPO Market* is defined as the top 25%/33% of in-sample distribution of the sum of IPOs occuring in the period +/−1 month of the IPO date (as in Helwege and Liang (2005)). *Industry Asset Liquidity* is calculated as the ratio of all completed corporate control transactions reported in SDC and sum of the total assets of firms in the same two-digit SIC code in a particular year as in Schlingemann et al. (2002). *EBITDA/Total Assets* is earnings before interest, taxes, and depreciation/amortization divided by total assets. *Low Cash Burn Firm* is indicator variable equal to zero if the ratio of EBITDA to cash fall into the highest tercile and one otherwise. *Q* equals market value of equity plus book value of debt divided by total assets. Market value of equity equals number of shares outstanding times the FY end stock price. *R&D/Total Assets* is research and development divided by total assets. *Capex/Total Assets* is capital expenditures divided by total assets. *Short-Term Debt/Total Assets* (*Long-Term Debt/Total Assets*) is the ratio of short-term (long-term) debt to total assets. *BHAR from IPO* measures the buy-and-hold return on the firm's stock less the buy-and-hold return on CRSP equal-weighted market index, starting the month after the IPO until 1 month prior to the relevant day for each subsample. *Excess Return (1 Year)* is the firm's cumulative monthly return in excess of CRSP equal-weighted market index, ending 1 month prior to the relevant day for each subsample. *Total Institutional Ownership* is the sum of institutional holdings as of the calendar quarter ending immediately prior to the relevant date scaled by number of shares outstanding. *Number of Institutional Owners* reports the number of institutional owners reporting ownership in the quarter ending immediately prior to the relevant date.

* Statistical significance at 10% relative to IPO Targets sample.
** Statistical significance at 5% respectively relative to IPO Targets sample.
*** Statistical significance at 1% relative to IPO Targets sample.

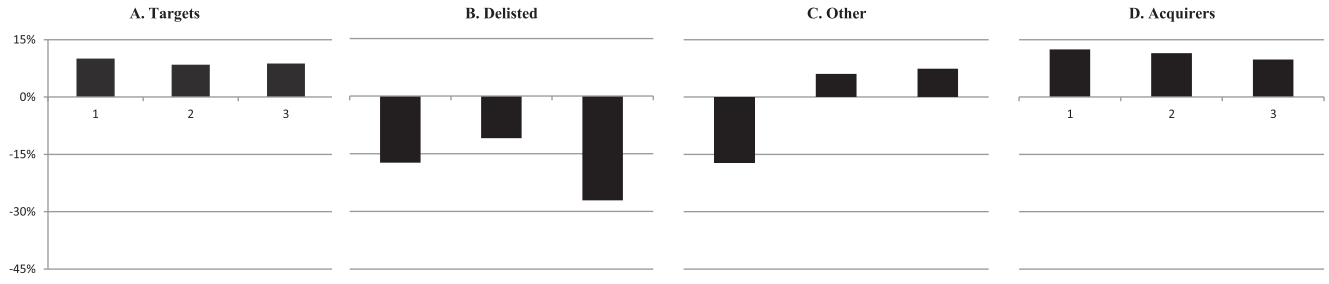

Fig. 1. Median EBITDA/total assets for IPOs.

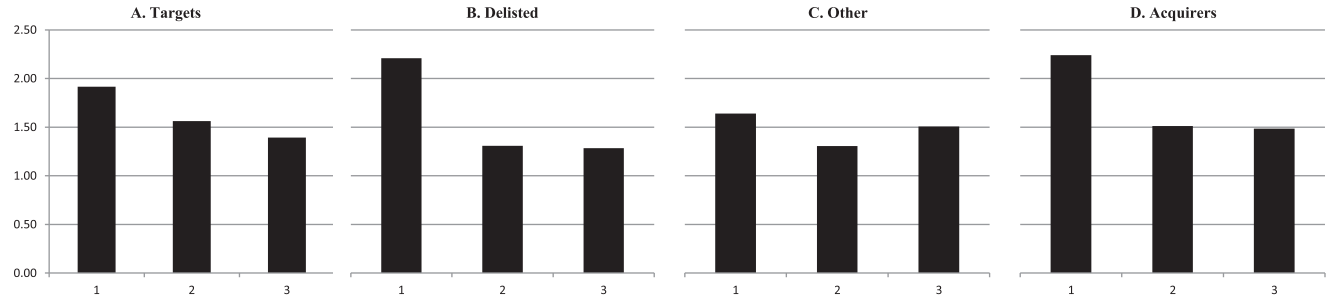

Fig. 2. Median *Q*.

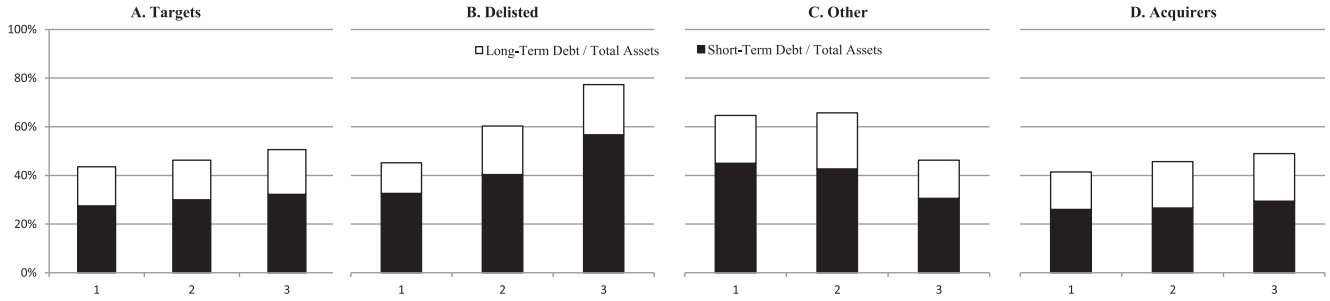

Fig. 3. Average leverage and composition of debt for IPOs.

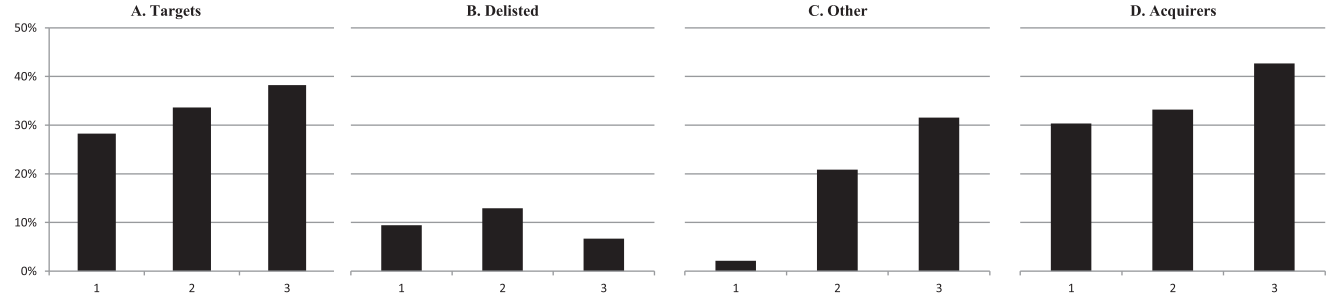

Fig. 4. Median institutional ownership for IPOs.

ating performance second only to Acquirers. It is reasonable to infer that IPO Targets are not, on average, in the same category of firms which get delisted after going public. IPO Targets' performance characteristics corroborate the hypothesis that they are acquired, on average, because of their strong post-IPO performance. With respect to institutional following, IPO Targets are also second only to Acquirers, indicating that IPO Target firms share many characteristics with surviving firms, often with IPO Acquirers.

3.4. Regression analysis

We rely on multinomial logistic regression analysis since the four distinct outcomes cannot be, *ex ante*, ordered in a meaningful way. When estimating a multinomial logistic regression, we select IPO Targets as the reference group against which we contrast the Delisted, Other IPOs, and Acquirer groups. We use the time-matched samples of Other IPOs and Acquirers, as described earlier in Section 3.2.

In all regressions, we control for the size of the offering and total assets of the firm, and include control variables that capture the amount of intangible assets, account for hot/cold IPO market conditions at the time of the listing, and reflect industry takeover activity. Finally, we control for VC backing of the IPO firms and the IPO underwriter quality. As is customary, all regressions include acquisition year indicators.[7]

Table 3 reports the results. In regression (1) we include control variables as well as variables related to the operating characteristics and stock price performance of IPO firms. *EBITDA/Total Assets* and *Low Cash Burn Rate* affect the probability of becoming an

[7] We report correlations between the independent variables in the Appendix Table A1. We also perform variance inflation tests for our regressions. Only *EBITDA/Total Assets* and *Number of Institutional Owners* have variance inflation statistics higher than 2.5 (a commonly used cutoff for logistic regressions) – specifically, the variance inflation statistics are 2.6 and 2.9, respectively. In unreported results we find that our conclusions are largely unaffected when we exclude these two variables from our regression models.

Table 3
Multinomial logistic regression.

	Regression (1)			Regression (2)		
	Targets/Delisted	Targets/Other	Targets/Acquirers	Targets/Delisted	Targets/Other	Targets/Acquirers
EBITDA/Total Assets	1.129***	0.258	−0.523**	1.282***	0.252	−0.490*
	(0.00)	*(0.28)*	*(0.05)*	*(0.00)*	*(0.29)*	*(0.06)*
Low Cash Burn Firm	0.741***	−0.131	−0.283**	0.828***	−0.133	−0.291**
	(0.00)	*(0.32)*	*(0.04)*	*(0.00)*	*(0.32)*	*(0.04)*
Q	−0.008	0.008	0.021	−0.002	0.008	0.020
	(0.72)	*(0.51)*	*(0.12)*	*(0.92)*	*(0.54)*	*(0.13)*
R&D/Total Assets	0.470	−1.535***	−1.061**	0.673	−1.586***	−1.198**
	(0.41)	*(0.00)*	*(0.02)*	*(0.24)*	*(0.00)*	*(0.01)*
Capex/Total Assets	−1.612***	−0.115	−0.051	−2.252***	−0.066	0.181
	(0.00)	*(0.79)*	*(0.91)*	*(0.00)*	*(0.88)*	*(0.69)*
Short-Term Debt/Total Assets	−0.931***	0.344*	0.221	−1.153***	0.361*	0.256
	(0.00)	*(0.09)*	*(0.29)*	*(0.00)*	*(0.08)*	*(0.22)*
Long-Term Debt/Total Assets	−1 014***	0.145	−0.263	−0.829***	0.150	−0.321
	(0.00)	*(0.50)*	*(0.20)*	*(0.01)*	*(0.48)*	*(0.12)*
BHAR since IPO	0.027	0.145***	−0.100**	0.119	0.148***	−0.108**
	(0.82)	*(0.00)*	*(0.03)*	*(0.33)*	*(0.00)*	*(0.02)*
Excess Return (1 Year)	2.192***	−0.146*	−0.013	2.063***	−0.150*	−0.010
	(0.00)	*(0.07)*	*(0.87)*	*(0.00)*	*(0.07)*	*(0.90)*
Number of Institutional Owners[#]				0.011**	0.001	−0.003*
				(0.03)	*(0.50)*	(0.07)
Total Institutional Ownership[#]				1.394***	−0.374*	−0.807***
				(0.00)	*(0.06)*	*(0.00)*
IPO Proceeds (billions)	0.538	0.073	0.210	−0.088	0.006	0.427**
	(0.40)	*(0.74)*	*(0.23)*	*(0.83)*	*(0.98)*	*(0.03)*
Total Assets	0.003	0.019	−0.016	0.007	0.016	−0.019*
	(0.92)	*(0.24)*	*(0.13)*	*(0.75)*	*(0.27)*	*(0.06)*
Intangible Assets/Total Assets	−0.516	3.602***	−0.615**	−0.619	3.584***	−0.609**
	(0.20)	*(0.00)*	*(0.01)*	*(0.13)*	*(0.00)*	*(0.02)*
Hot IPO Market	−0.024	0.144	0.011	−0.016	0.134	−0.008
	(0.87)	*(0.13)*	*(0.91)*	*(0.92)*	*(0.16)*	*(0.93)*
Cold IPO Market	−0.168	−0.031	0.112	−0.229	−0.023	0.131
	(0.59)	*(0.87)*	*(0.55)*	*(0.47)*	*(0.90)*	*(0.48)*
Industry Asset Liquidity	0.533	4.762***	2.530***	0.191	4.785***	2.571***
	(0.70)	*(0.00)*	*(0.01)*	*(0.89)*	*(0.00)*	*(0.00)*
VC Backed	0.533***	0.230**	−0.044	0.422***	0.249***	0.023
	(0.00)	*(0.01)*	*(0.63)*	*(0.01)*	*(0.01)*	*(0.80)*
High Rank Underwriter	1.220***	0.291***	0.459***	1.010***	0.317***	0.586***
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
Max. Rescaled *R*-Squared		0.311			0.326	
Pr(Likelihood Ratio)		0.000			0.000	
N		5994			5994	

This table shows estimates of multinomial logistic regressions modeling the probability of an IPO firm getting acquired within the first 3 years following the IPO. The sample is described in Table 1; variables and time-matching algorithm are described in Table 2 and Section 3.2. All models include year indicators (not reported). Numbers in parentheses show *p*-values associated with individual coefficients.

* Statistical significance at 10%.
** Statistical significance at 5%.
*** Statistical significance at 1%.
[#] A variable orthogonolized with respect to other independent variables (results of first stage models are reported in Appendix A Table A2.

acquisition target positively relative to Delisted IPOs, negatively relative to Acquirers, and have no effect relative to Other IPOs. This is consistent with the operating performance hypothesis in that the Targets are similar to Other IPOs. Consistent with our univariate results, growth opportunities (*Q*) do not have a statistically significant impact on the probability of becoming an acquisition target, indicating again lack of support for the growth opportunities hypothesis. Amount of short-term debt affects the probability of becoming an acquisition target significantly negatively for the reference group of Delisted IPOs only, indicating that IPO Targets are unlikely to be acquired because of their inability to roll over short-term debt and thereby supporting the financial slack hypothesis. With respect to market pricing, *BHAR since IPO* has statistically significant positive effect on the probability of becoming a target relative to the Other IPOs group, while it has significant negative effect for the reference group of Acquirers, and insignificant effect for the group of Delisted IPOs. Results for *Excess Return (1 Year)* imply a significant positive (negative) effect on the probability of becoming a target for a reference group of Delisted (Other) IPOs, while there is no statistically reliable effect for the IPO Acquirers benchmark group. These results are generally consistent with the stock performance hypothesis in that for at least one control group of surviving firms, the stock performance of IPO Targets is either better or not significantly different.[8]

Prior literature identifies a significant relation between institutional ownership and firms' post-IPO performance (Helwege et al., 2007; Field and Lowry, 2009). This could lead to potentially incorrect inferences regarding the effect of post-IPO performance on the likelihood of becoming a target, since some of the informational content of the institutional following variables is in fact related to the firm's post-IPO performance. To address this concern, we estimate a first stage OLS regression that identifies the effect of

[8] When we restrict our analysis to the 2094 firms with available insider ownership data, we note that our conclusions about IPO Targets with respect to the reference group of Delisted IPOs are not affected. However, for the reference group of IPO Acquirers the coefficients of *EBITDA/Total Assets*, *Low Cash Burn Firm* indicator, and *BHAR since IPO* are not longer significant, further supporting our findings that IPO Targets are comparable to surviving firms. Inclusion of insider ownership does not affect these results. Insider ownership at the time of the IPO enters with positive and significant coefficient for the control groups of Other IPOs and IPO Acquirers.

firm's characteristics and performance on institutional ownership. In our logistic model we use the unexplained portion of the change in institutional ownership from the first step regressions in lieu of the actual institutional ownership variable. Specifically, we estimate an OLS regression with *Institutional Ownership* as a dependent variable and performance, operating, and size characteristics as independent variables. From this OLS regression, we obtain *Institutional Ownership#*, the institutional ownership unexplained by a firm's post-IPO performance and characteristics, and include it in our logistic regression analysis. We obtain *Number of Institutional Owners#* in a similar manner. Results of the first step OLS regression are reported in Table A2 in the Appendix A.

The results of the logistic regression (2) in Table 3 show that institutional ownership increases the likelihood of becoming an acquisition target relative to Delisted IPOs while the effect of institutional ownership is negative and significant for the control groups of Other IPOs and Acquirers. The effect of *Number of Institutional Owners#* is generally consistent with the effect of institutional ownership. However, significant coefficients are only observed for the control groups of Delisted IPOs and Acquirers. These results indicate that attracting institutional ownership is important for continued survival of firms, thus offering mixed support for the institutional interest hypothesis.[9]

Overall, the results indicate that becoming a target shortly after an IPO does not appear to be an indication of failure on the part of the IPO Targets as they (Targets) post better operating and stock performance compared to Delisted IPOs. We find mixed support for the institutional interest hypothesis. Specifically, institutional following of IPO Targets immediately prior to acquisition is lower than the institutional following of surviving firms; however, it is higher than the institutional following of Delisted IPOs. Finally, growth opportunities do not affect the likelihood of becoming a target.

3.5. Analysis of investment behavior

In this section, we test whether the profitability of post-IPO investments is related to the success of the newly listed firms as formally stated in Hypothesis 3 by investigating a particular type of investment: acquisitions. An acquisition is an important corporate investment decision that provides immediate market feedback to the firm about the effects such investments have on shareholder value. Some IPO Targets in our sample make at least one acquisition after the IPO but prior to being acquired themselves. This offers us an opportunity to examine whether the acquisition decisions of IPO Targets and IPO Acquirers differ systematically in terms of their impact on shareholder value. If newly listed firms become acquisition targets because they make value destroying acquisitions, we should observe lower acquisition announcement returns for IPO Targets versus Acquirers.

We identify acquisitions made by IPO Targets and Acquirers from the SDC database subject to the same selection criteria as outlined in Section 3.1. We find that 269 Targets make 496 acquisitions prior to being acquired themselves. Acquirers in our sample make a total of 5559 acquisitions within the 3 year window following their IPOs. For all acquisitions, we measure *Acquirer CAR(−2,+2)* as the 5 day return in excess of CRSP equal-weighted index centered on the announcement date of the acquisition. For IPO Targets, the average *Acquirer CAR(−2,+2)* for acquisitions paid for by cash and equity is 2.58% and 1.46%, respectively. IPO Acquirers post comparable average abnormal return of 1.57% and 1.14% when paying for acquisitions with cash and equity, respectively. For both IPO Targets and Acquirers, the average *Acquirers CAR(−2,+2)* is significantly higher than zero at the 0.05 level. The average announcement returns for IPO Targets and Acquirers are not significantly different from each other.

We next compare *Acquirer CAR(−2,+2)* for the two samples in a regression setting controlling for the customary target, acquirer, and deal characteristics. Consistent with prior literature,[10] we identify acquisitions of public and private firms as well as subsidiaries and define two indicator variables: *Private Indicator* and *Subsidiary Indicator*. Lang et al. (1989, 1991) and Servaes (1991) report that acquirers' announcement returns are positively related to their Tobin's *Q*. Moeller et al. (2004) show that size is an important determinant of acquirer announcement returns. We use natural log of acquirer's total assets as a measure of size. Asquith et al. (1983), Jarrell and Poulsen (1989), and Servaes (1991) find that acquirer returns are positively related to the target's size relative to the acquirer. We define *Relative Size* as the ratio of deal value to the sum of acquirer's market value of equity and book value of total liabilities. Attitude (Servaes (1991)) and form of payment (Travlos, 1987; Huang and Walkling, 1987; Wansley et al., 1983) are both important deal-specific determinants of acquirer announcement returns. We therefore control for attitude and form of payment by including indicator variables *Friendly* and *Consideration = Cash* whose values are based on the information available in the SDC database. Industry and year indicators are included in all regressions.

Results of regression analyses are reported in Table 4. The variable of interest is *IPO Target Indicator* which is set equal to one if the acquisition is made by a firm that subsequently gets acquired (i.e. IPO Targets) and to zero otherwise. The results in regression (1) indicate that Targets experience 0.40% higher *Acquirer CAR(−2,+2)* than do Acquirers but the coefficient is not significant. In regression (2) we interact *IPO Target Indicator* with the listing status of the target in the current acquisition to examine differences in acquisitions of private and subsidiary targets. Coefficients of both interaction variables are positive, but neither is statistically significant.[11] Based on the results in Table 4, we conclude that IPO Targets, which engage in acquisitions as acquirers prior to becoming targets themselves, do not destroy shareholder value by virtue of their post-IPO investment decisions. This evidence is consistent with the profitability of investments hypothesis which states that, on average, IPO Targets and Acquirers make investments of comparable profitability.

3.6. Two-stage sale and shareholder wealth[12]

So far, the results show that, on average, newly listed firms get acquired due to their strong performance. In this section we examine whether in the cross-section of IPO Targets, the decision to list via IPO affords the firm bargaining power to obtain higher

[9] Note that if the regressions in Table 3 were OLS, the coefficients on the operating and stock performance characteristics in regression (2) should be identical to those in regression (1). However, in a logistic regression the variance of the underlying latent independent variable changes as it is regressed on increasing number of independent variables. This is due to the fact that in a logistic regression, the latent variable is normalized by fixing its residual variance. Since the residual variance is fixed, as more independent variables are added to the model, the explained variance increases, and the total variance of the independent variable increases. Therefore, even when the dependent variables are perfectly uncorrelated (via linear regression), we observe slight changes in coefficients for operating and stock characteristics. Note that the coefficients on independent variables that were not used in the orthogonalization regressions do not change, as would be expected.

[10] For discussion of literature, see, Faccio et al. (2006).

[11] We note that the adjusted *R*-squared in both regression is approximately 0.019. Other research reports adjusted *R*-squared for regression of acquirer announcement returns to be between 0.035 and 0.073 (for example, Fuller et al. (2002) and Ang and Mauck (2011)). Therefore, our results indicate that standard explanatory variables used in analyses of acquirer announcement returns have lower ability to explain the variation of such returns for acquirers that are recent IPO firms than for acquirers that are seasoned firms.

[12] We thank the anonymous referee for suggesting this analysis.

Table 4
Acquirer CAR (−2, +2).

	(1)	(2)
Intercept	0.011	0.011
	(0.527)	*(0.521)*
IPO Target Indicator	0.004	−0.009
	(0.516)	*(0.564)*
Private Indicator	0.029***	0.028***
	(0.000)	*(0.000)*
Subsidiary Indicator	0.035***	0.033***
	(0.000)	*(0.000)*
IPO Target × Private Indicator		0.009
		(0.616)
IPO Target × Subsidiary Indicator		0.032
		(0.105)
Acquirer *Q*	0.660	0.670
	(0.315)	(0.309)
Log(Acquirer TA)	−0.002*	−0.002*
	(0.064)	(0.067)
Relative Size (/1000)	−0.127	−0.134
	(0.398)	*(0.376)*
Friendly	−0.019	−0.018
	(0.165)	*(0.178)*
Consideration = Cash	0.005*	0.005
	(0.099)	*(0.139)*
Adjusted *R*-Squared	0.0187	0.0192
Observations	6055	6055

This table shows estimates of OLS regressions analyzing abnormal returns to acquirers. The sample includes IPO Acquirers as well as IPO Targets that acquired other firms prior to being acquired themselves. *IPO Target Indicator* is set equal to one if the acquiring firm is IPO Target and to zero otherwise. *Private (Subsidiary) Indicator* is set equal to one if the target is a private firm (subsidiary) and to zero otherwise. Firm-specific variables are measured at the fiscal year end immediately preceding the announcement of the acquisition analyzed. *Acquirer Q* is the ratio of market value of equity plus book value of debt divided by book value of total assets (coefficient is multiplied by 1000). *log(Acquirer TA)* is the natural log of total assets. *Relative Size* the deal value divided by the sum of market value of equity and book value of liabilities (coefficient is multiplied by 1000). *Friendly* is an indicator variable equal to one if SDC characterizes the attitude as friendly and to zero otherwise. *Consideration = Cash* is an indicator variable equal to one if SDC reports that at least 90% of the consideration offered is cash and to zero otherwise. All models include acquisition year and industry indicators (not reported). Numbers in parentheses show *p*-values associated with individual coefficients, determined using heteroskedastic standard errors clustered at the firm level.

* Statistical significance at 10%.
** Statistical significance at 5%.
*** Statistical significance at 1%.

Table 5
Analysis of shareholder wealth changes for IPO targets.

Industry Asset Liquidity: Time From IPO to Acquisition:		Low Long (*N* = 227) (%)	High Short (*N* = 229) (%)	*p*-Value
IPO Underpricing	*Ave*	11.66	28.09	*0.000*
	Med	5.36	7.69	*0.048*
Premium				
Cash consideration	*Ave*	31.64	24.89	*0.266*
	Med	21.88	24.26	*0.506*
Stock consideration	*Ave*	17.50	18.94	*0.739*
	Med	18.53	14.89	*0.286*
BHAR Including IPO Underpricing (Monthly)				
Cash consideration	*Ave*	−0.64	−0.90	*0.705*
	Med	−1.81	−1.13	*0.681*
Stock consideration	*Ave*	−1.14	−0.47	*0.524*
	Med	−2.45	−2.51	*0.448*

This table reports the test of means and medians of IPO Targets sorted based on *Industry Asset Liquidity (Low/High)* and time between IPO and acquisition *(Long/Short)*. The IPO Target sample is split by medians of each variable using independent sorts. Sample is described in Table 1. *IPO Underpricing* is the return on the first trading day starting at the IPO price. *Premium* is the 5 day return in excess of CRSP equal-weighted market return, centered on the announcement date of the acquisition (the announcement date is not available for all observations). *BHAR Including IPO Underpricing* is the buy-and-hold return starting from the IPO price through delisting minus the buy-and-hold return for CRSP equal-weighted market over the same time period. *p* value is for the two-tailed test of means and medians.

value for their shareholders. We focus on how shareholder wealth is affected by length of listing and industry-specific activity in the market for corporate control.[13] Firms that end up being acquired shortly after their IPOs and firms going public during a period of high industry liquidity are likely to be firms pursuing an IPO with the intent of selling the firm to an interested acquirer.[14] On the other hand, firms becoming takeover targets long after their IPOs may have pursued listing with intentions other than selling out to an acquirer.

To measure the effect of the above-described characteristics on shareholder wealth, we calculate *IPO Underpricing* as the percentage change from the IPO price to the first day close and *Premium* as the 5 day cumulative excess return over the equal-weighted CRSP market return centered on the announcement date of the acquisition. For completeness, we also calculate the *BHAR Including IPO Undepricing* as the buy-and-hold return from the IPO price through delisting less the buy-and-hold return on the equal-weighted CRSP market return over the same period. Since the *BHAR Including IPO Undepricing* for the two subsamples is measured over periods of different length, we adjust it to reflect the monthly average (i.e. we divide the returns by the number of months between the IPO and the delisting dates).

In Table 5, we report results when we split the sample into four groups based on the medians of industry acquisition activity and the time between the IPO and acquisition. We then focus on the groups of IPO Targets (i) with short time between IPO and acquisition and high industry acquisition activity (229 firms) versus (ii) IPO Targets with long time between IPO and acquisition and low industry acquisition activity (227 firms). The findings are consistent with the notion that firms that get acquired shortly after their IPOs at a time of high industry acquisition activity experience significantly higher IPO day return (*IPO Underpricing*). However, there does not appear to be any effect of the sorting characteristics on premium or the stock price performance as measured by *BHAR Including IPO Underpricing*. Overall, shareholders of firms that get acquired shortly after their IPOs and at a time of high industry acquisition activity, experience significantly higher increases in their wealth on the listing day than other IPO Targets. However, the premiums and the market-adjusted buy and hold returns are not significantly higher.

4. Robustness analysis

4.1. Hazard model

The multinomial logistic regression analysis does not take into account the time between the IPO and subsequent acquisition for Targets (or delisting for Delisted IPOs) and neither does it capture the changing characteristics of firms over time. For example, multinomial logistic regression model treats an IPO firm acquisition occurring in the first year in the same fashion as an acquisition of an IPO firm occurring in the third year and does not capture the changing characteristics of firms between the first and third

[13] Short of performing a survey of or interviews with managers, it is impossible to infer the intent to sell the firm at the time of the listing.
[14] Since all of IPO Targets delist as a result of the acquisition and the acquirers purchase all their shares in the acquisition, we cannot consider the impact of partial sales.

Table 6
Hazard models (counting process).

	Targets/ Delisted (1)	Targets/ Other (2)	Targets/ Acquirers (3)
EBITDA/Total Assets	0.616***	−0.063	−0.403***
	(0.00)	*(0.67)*	*(0.01)*
	[1.852]	*[0.939]*	*[0.669]*
Low Cash Burn Firm	0.276***	0.115	−0.150*
	(0.00)	*(0.18)*	*(0.08)*
	[1.318]	*[1.122]*	*[0.861]*
Q	−0.005	0.004	−0.021**
	(0.61)	*(0.65)*	*(0.02)*
	[0.995]	*[1.004]*	*[0.980]*
R&D/Total Assets	0.277	−1.076***	0.042
	(0.26)	*(0.00)*	*(0.88)*
	[1.319]	*[0.341]*	*[1.043]*
Capex/Total Assets	−0.521*	−0.377	0.047
	(0.05)	*(0.16)*	*(0.86)*
	[0.594]	*[0.686]*	*[1.048]*
Short-Term Debt/Total Assets	−0.374***	0.327***	0.368***
	(0.01)	*(0.01)*	*(0.01)*
	[0.688]	*[1.387]*	*[1.444]*
Long-Term Debt/Total Assets	−0.242*	0.237*	0.077
	(0.06)	*(0.06)*	*(0.57)*
	[0.785]	*[1.268]*	*[1.080]*
BHAR since IPO	−0.001	0.005	0.010
	(0.88)	*(0.50)*	*(0.25)*
	[0.999]	*[1.005]*	*[1.010]*
Excess Return (1 Year)	0.164***	−0.006	−0.137***
	(0.00)	*(0.87)*	*(0.00)*
	[1.178]	*[0.994]*	*[0.872]*
Number of Institutional Owners[#]	0.000	0.002*	−0.001
	(0.67)	*(0.06)*	*(0.45)*
	[1.000]	*[1.002]*	*[0.999]*
Total Institutional Ownership[#]	0.302**	0.243*	−0.001
	(0.03)	*(0.07)*	*(0.99)*
	[1.353]	*[1.275]*	*[0.999]*
IPO Proceeds (billions)	0.009	−0.218	0.125
	(0.95)	*(0.21)*	*(0.25)*
	[1.009]	*[0.804]*	*[1.133]*
Total Assets	0.001	0.013	−0.011*
	(0.88)	*(0.10)*	*(0.06)*
	[1.001]	*[1.013]*	*[0.989]*
Intangible Assets/Total Assets	−0.312*	1.484***	−0.221
	(0.06)	*(0.00)*	*(0.19)*
	[0.732]	*[4.409]*	*[0.801]*
Hot IPO Market	0.006	0.077	−0.023
	(0.93)	*(0.22)*	*(0.71)*
	[1.006]	*[1.080]*	*[0.977]*
Cold IPO Market	−0.044	−0.200*	−0.093
	(0.72)	*(0.10)*	*(0.44)*
	[0.956]	*[0.819]*	*[0.912]*
Industry Asset Liquidity	0.402	1.692***	1.283**
	(0.50)	*(0.00)*	*(0.01)*
	[1.495]	*[5.431]*	*[3.609]*
VC Backed	0.147**	0.194***	0.020
	(0.02)	*(0.00)*	*(0.74)*
	[1.158]	*[1.214]*	*[1.020]*
High Rank Underwriter	0.308***	0.124**	0.209***
	(0.00)	*(0.04)*	*(0.00)*
	[1.360]	*[1.132]*	*[1.232]*
Pr(Likelihood Ratio)	0.000	0.000	0.000

This table shows estimates of proportional Cox hazard model using the counting process, modeling the probability of an IPO firm becoming an acquisition target within first 3 years following its IPO. Covariates are allowed to vary every year. Models 1–3 use the sample of Delisted, Other IPOs, and Acquirers as the control group, respectively. The sample is described in Table 1 and variables are defined in Table 2. Hazard ratios for each coefficient are reported in brackets.

* Statistical significance at 10%.
** Statistical significance at 5%.
*** Statistical significance at 1%.
[#] A variable orthogonolized with respect to other independent variables (results of first stage models are reported in Appendix A Table A2. All models include year indicators (not reported). Numbers in parentheses show *p*-values associated with individual coefficients.

years. We therefore estimate a hazard model using the counting process that allows for the independent variables to change over time (Cox, 1972; Andersen and Gill, 1982).

Hazard model assesses the conditional probability of an event, given that the event has not occurred up to the present time (i.e. the hazard rate). The counting process further allows for multiple measurement intervals prior to the censoring event and allows for the independent variables to change over time (Andersen and Gill, 1982). The positive (negative) effect of an independent variable in hazard model is interpreted as accelerating (decelerating) the time-to-event, hence, increasing (decreasing) the probability of an event. The event in our study is the acquisition of an IPO firm. However, since hazard models can be used to distinguish only between two outcomes, we estimate three separate hazard models using three distinct control groups: (i) Delisted IPOs, (ii) Other IPOs, and (iii) Acquirers.

Table 6 reports the hazard model results. In regressions (1) through (3) the signs and significance levels of coefficients on *EBITDA/Total Assets* and *Low Cash Burn Firm* are consistent with our prior results. Namely, positive and significant coefficients for Delisted IPOs control group, insignificant coefficients for Other IPOs control group, and negative and significant coefficients for Acquirers. Future growth opportunities, measured by *Q*, which were previously insignificant for all control groups, now enter with negative and significant coefficient for the control group of Acquirers. Amount of short-term debt affects the probability of becoming a target significantly negatively for reference group of Delisted IPOs and positively for both Other IPOs and Acquirers. With respect to stock performance, the hazard model results are consistent with our prior conclusions, although *BHAR since IPO* is not significant for any control group while *Excess Return (1 Year)* is positive and significant for reference group of Delisted IPOs and negative and significant for reference group of Acquirers. Finally, institutional following does not have a significant effect on the probability of becoming an acquisition target when Acquirers are the control group. However, when using Delisted IPOs and Other IPOs as the control groups, institutional ownership has a positive and significant impact on the probability of becoming a target. This indicates that IPO Targets are able to attract and retain institutional ownership, and the results provide stronger support of the institutional interest hypothesis than implied by the multinomial logit regressions.

The stronger results likely reflect the time-varying nature of the institutional ownership variables. Examining the patterns in Fig. 4, we note that institutional ownership of IPO Targets exceeds the institutional ownership of Other IPOs in years one and two and exhibits higher increase than is experienced by IPO Acquirers in year two. While this variation is not taken into account by the multinomial logistic regression, it affects the hazard model estimates.

Overall, our conclusion that acquisition of IPO Target firms is not a reflection of their failure is not affected by the choice of a modeling technique. Furthermore, the results for institutional following of IPO firms indicate that IPO Targets are able to attract sufficient institutional ownership. The hazard model results corroborate our earlier findings of firms becoming targets shortly after listing due to their success.

4.2. 1999–2000 IPO period

Since our sample period includes the hot IPO market of 1999 and 2000 (“IPO bubble”), we examine the sensitivity of our results to exclusion of targets that went public during the IPO bubble. We define the IPO bubble period to last from January 1999 through the end of 2000 (Loughran and Ritter, 2004; Bradley et al., 2008). We

Table 7
Multinomial logistic regression: robustness.

	Regression (1)			Regression (2)		
	Targets/Delisted	Targets/Other	Targets/Acquirers	Targets/Delisted	Targets/Other	Targets/Acquirers
EBITDA/Total Assets	0.289	0.178	−0.953*	2.266***	0.858***	−0.116
	(0.57)	*(0.68)*	*(0.05)*	*(0.00)*	*(0.00)*	*(0.72)*
Low Cash Burn Firm	0.564	−0.740*	−0.523	0.849***	−0.035	−0.290*
	(0.31)	*(0.06)*	*(0.15)*	*(0.00)*	*(0.82)*	*(0.07)*
Q	−0.024	0.031	0.023	0.050	0.004	−0.016
	(0.48)	*(0.28)*	*(0.32)*	*(0.18)*	*(0.85)*	(0.42)
R&D/Total Assets	−2.239*	−2.574**	−3.053***	1.816***	−0.601	0.038
	(0.06)	*(0.02)*	*(0.01)*	*(0.01)*	*(0.19)*	*(0.94)*
Capex/Total Assets	−1.577	1.647	−0.411	−1.780***	−0.246	−0.030
	(0.35)	*(0.36)*	*(0.80)*	*(0.00)*	(0.59)	(0.95)
Short-Term Debt/Total Assets	0.264	0.260	−0.826	−1.042***	0.494**	0.474**
	(0.77)	*(0.71)*	*(0.20)*	*(0.00)*	*(0.02)*	*(0.04)*
Long-Term Debt/Total Assets	−3.315***	−1.258	−0.842	−0.643*	0.353	−0.150
	(0.00)	*(0.14)*	*(0.30)*	*(0.06)*	*(0.11)*	*(0.48)*
BHAR since IPO	0.361	−0.404	−0.194	−0.051*	0.030**	0.032**
	(0.59)	*(0.12)*	*(0.42)*	*(0.06)*	*(0.05)*	(0.03)
Excess Return (1 Year)	2.461***	−0.011	−0.160	2.044***	−0.012	−0.038
	(0.00)	*(0.96)*	*(0.43)*	*(0.00)*	*(0.80)*	*(0.43)*
Number of Institutional Owners#	0.002	0.006	0.004	0.019***	0.003	−0.004**
	(0.84)	*(0.21)*	*(0.36)*	*(0.01)*		*(0.04)*
Total Institutional Ownership#	1.115	−1.092	−0.473	1.052*	−0.331	−0.885***
	(0.35)	*(0.15)*	*(0.49)*	*(0.06)*	*(0.11)*	*(0.00)*
IPO Proceeds (billions)	−2.349	−1.080	−1.139	−0.085	−0.079	0.637**
	(0.13)	*(0.20)*	*(0.16)*	*(0.89)*	(0.77)	*(0.01)*
Total Assets	1.251*	0.017	0.006	0.013	0.030	−0.028**
	(0.06)	*(0.37)*	*(0.74)*	*(0.55)*	*(0.14)*	(0.03)
Intangible Assets/Total Assets	−1.913**	4.525***	−1.885***	−0.176	3.593***	−0.412
	(0.02)	*(0.00)*	*(0.00)*	*(0.72)*	*(0.00)*	*(0.14)*
Hot IPO Market	0.135	−0.352	−0.436*	−0.091	0.192*	0.060
	(0.67)	*(0.19)*	*(0.06)*	*(0.60)*	*(0.07)*	(0.58)
Cold IPO Market	11.934	−0.080	1.002	−0.347	−0.127	−0.117
	(0.97)	*(0.91)*	*(0.17)*	*(0.32)*	(0.55)	*(0.58)*
Industry Asset Liquidity	6.148	3.235	−5.009	−0.367	3.833***	2.599***
	(0.30)	*(0.47)*	*(0.21)*	*(0.81)*	*(0.00)*	*(0.01)*
VC Backed	0.482	0.365	−0.654**	0.514***	0.108	−0.053
	(0.19)	*(0.23)*	*(0.02)*	*(0.00)*	(0.29)	(0.61)
High Rank Underwriter	1.242***	−0.367	0.292	1.344***	0.253***	0.352***
	(0.00)	*(0.33)*	*(0.38)*	*(0.00)*		*(0.00)*
Max. Rescaled *R*-Squared		0.497			0.324	
Pr(Likelihood Ratio)		0.000			0.000	
N		678			5316	

This table shows estimates of multinomial logistic regressions modeling the probability of an IPO firm getting acquired within the first 3 years following the IPO for IPOs taking place during 1999–2000 period (regression (1)) and for IPOs excluding IPOs taking place during 1999–2000 period (regression (2)). The sample is described in Table 1 and variables are defined in Table 2. All models include year indicators (not reported). Numbers in parentheses show *p*-values associated with individual coefficients.

* Statistical significance at 10%.

** Statistical significance at 5%.

*** Statistical significance at 1%.

\# A variable orthogonolized with respect to other independent variables (results of first stage models are reported in Appendix A Table A2.

note fewer than 11% of the IPOs in our sample take place during the 1999–2000 IPO bubble period.

In Table 7, we report results of multinomial logistic regressions for subsample of IPOs taking place during the 1999–2000 period (regression (1)) and outside of the 1999–2000 IPO period (regression (2)). During the IPO bubble period (regression (1)), the results are weaker and generally insignificant. In regression (2), better operating performance increases the probability of becoming target against the reference groups of Delisted and Other IPOs, while it does not have a significant effect on the probability when Acquirers are used as a reference group. Similar to prior results, coefficients on *Q* are insignificant for all reference groups. The coefficient for the *BHAR since IPO* is significantly positive for the reference group of Delisted IPOs and significantly negative for the reference group of Acquirers. This indicates that operating characteristics of Target IPOs outside of the 1999–2000 period are actually stronger, further supporting the finding that Targets are well managed firms on par with surviving IPOs. Furthermore, outside of the IPO bubble period, IPO Targets exhibit stock price performance similar to Other IPOs. With respect to institutional following, the results of regression (2) are similar those in Table 3, with one exception: institutional ownership does not affect the likelihood of IPO firms getting acquired when using Other IPOs as the reference group.

4.3. Target versus bidder initiated acquisitions

The identity of the party initiating the acquisitions of IPO Targets has the potential of providing additional insights into our analysis. To the extent that in the sample of IPO Targets, target initiated and bidder initiated acquisitions are systematically different, some of our prior results may reflect the motivation behind the acquisition subsequent to the IPO that was present at the time of the IPO. We therefore collect the information on the identity of the originating party from the transaction description contained in the SEC filings around the acquisition. Due to the labor intensive

nature of the data collection process, we analyze a random sample of observations, specifically focusing on IPOs taking place in the last 7 years of our sample period, a period for which SEC filings are reliably available on www.edgar.gov. We further focus on acquisitions made by public acquirers, to ensure availability of SEC filings for both the target and the acquirer. The period is noted for declining IPO and merger activity. We obtain data from the SEC filings available at www.sec.gov and review each filing containing the description of the proposed transaction and record the identity of the initiating party as 'target initiated' or 'bidder initiated' or 'unclear'.

Results reported in Table 8 show that for a subsample of Targets that went public between 2000 and 2006, the numbers of acquisitions undertaken is evenly distributed between the categories 'target initiated', 'bidder initiated', and 'unclear'. The results indicate that target initiated acquisitions involve IPO firms with higher cash burn rates, lower growth prospects (Q), higher capital expenditures, and lower institutional following. We also collect additional information for these acquisitions and the acquirers from the SDC Mergers and Acquisitions database. We note that target initiated acquisitions involve higher proportion of cash consideration paid. However, with respect to attitude, presence of multiple bidders, and relative size of the target and the bidder, there are no significant differences. Finally, we do not observe systematic differences between the target and bidder initiated acquisitions with respect to acquirer size, diversifying acquisitions, amount of shares held by the acquirer at the time of the offer, and nationality of the acquirer.

Overall, the results indicate that while the majority of the firms that get acquired attract acquirers on account of their experiencing success after the IPO, some of the firms actively seek out an acquirer as a direct result of their weak growth prospects. However, these results have to be interpreted with caution because we are studying IPO firms during a time period characterized by relatively low IPO activity.

Table 8
Random IPO targets sub-sample.

		Target Initiated	Bidder Initiated	Unclear
Sample Size	*N % of Sample*	43	44	41
		33.6%	34.4%	32.0%
Target Characteristics:				
Total Assets (million)	*Ave*	$540	$283	$541
	Med	$101	$128	$88
EBITDA/Total Assets	*Ave*	−13.5%	−15.8%	−24.6%
	Med	−1.4%	−12.0%	−6.5%
Low Cash Burn Firm	*Ave*	0.63	0.82**	0.73
Q	*Ave*	1.82	4.87***	3.52**
	Med	1.33	2.62***	1.95*
R&D/Total Assets	*Ave*	8.6%	9.8%	9.2%
	Med	6.0%	6.3%	7.3%
Capex/Total Assets	*Ave*	7.5%	4.2%**	6.3%
	Med	4.9%	3.0%**	4.7%
Short-Term Debt/Total Assets	*Ave*	23.4%	18.3%	23.4%
	Med	16.9%	15.2%	16.8%
Total Institutional Ownership	*Ave*	26.0%	35.6%*	26.4%
	Med	21.9%	34.4%	14.2%
Number of Institutional Owners	*Ave*	28.6	50.0***	36.3
	Med	19.0	44.5***	23.0
Acquisition Characteristics:				
% Cash Consideration	*Ave*	52.2%	35.0%*	35.1%*
	Med	55.3%	0.0%**	0.0%*
% Stock Consideration	*Ave*	40.5%	62.7%**	62.6%**
	Med	0.0%	97.1%**	100.0%**
Friendly Indicator	*Ave*	1.00	0.95	0.95
Multiple Bidder Indicator	*Ave*	0.07	0.05	0.00*
Relative size	*Ave*	29.1%	24.3%	29.9%
	Med	17.3%	13.8%	18.7%
Acquirer Characteristics:				
Market Capitalization (million)	*Ave*	$17,463	$25,836	$18,486
	Med	$1163	$2827*	$1306
Same Industry Acquirer	*Ave*	0.44	0.30	0.37
Toehold	*Ave*	33.8%	94.3%	48.0%
	Med	0.0%	0.0%	0.0%
International Acquirer	*Ave*	0.05	0.00	0.12

This table analyzes a random subset of 128 IPO Targets by public acquirers for which acquisitions occurred after 1999 and SEC filings are available describing the details of the acquisition. IPO Targets sample is described in Table 1. *Target* or *Bidder Initiated* or *Unclear* classifications are obtained by reviewing relevant SEC filings and determining whether the initiating party of the acquisition was the target, bidder or is unclear. All other variables are defined Table 2.

* Statistical significance at 10% relative to *Target Initiated* sample.
** Statistical significance at 5% relative to *Target Initiated* sample.
*** Statistical significance at 1% relative to *Target Initiated* sample.

5. Conclusions

We study why recent IPOs get acquired and specifically address the question of whether becoming an acquisition target shortly after an IPO is symptomatic of success or failure of the newly listed firm. Using a sample of firms going public between 1980 and 2006, we identify four distinct groups of firms within that sample: firms that became acquisition targets within 3 years after going public; firms that delisted due to negative reasons; firms that acquired other firms after becoming public and remained independent 3 years after the IPO; and firms that did not get involved in an acquisition within 3 years following their IPOs but remained independent at the end of the 3 years after the listing.

We address the success-failure dichotomy with regard to IPO firms that become targets shortly after listing and find that such firms are comparable to surviving rather than to delisted firms. In particular, we document that operating characteristics, stock performance, and institutional ownership of newly listed firms are important characteristics affecting the likelihood of firms getting acquired shortly after listing. Firms which do well operationally, post superior stock returns, and attract institutional investor interest, draw the attention of acquirers. We also observe that the target IPO firms that make acquisitions prior to becoming targets themselves realize positive announcement period abnormal returns, comparable to those posted by the group of IPO firms labeled Acquirers in our study.

Overall, based on the evidence presented in this paper, acquisitions of newly listed firms are motivated, on average, by the firms' successful post-IPO performance.

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Appendix A

See Tables A1 and A2.

Table A1
Correlation matrix.

Target characteristics	EBITDA/ Total Assets	Low Cash Burn Firm	*Q*	R&D/ Total Assets	Capex/ Total Assets	Short-Term Debt/Total Assets	Long-Term Debt/Total Assets	BHAR since IPO	Excess Return (1 Year)	Number of Institutional Owners	Total Institutional Ownership	IPO Proceeds	Total Assets	Intangible Assets/Total Assets	Hot IPO Market	Cold IPO Market	Industry Asset Liquidity	VC Backed
Low Cash Burn Firm	−0.66																	
Q	−0.14	0.16																
R&D/Total Assets	−0.60	0.40	0.21															
Capex/Total Assets	0.03	−0.02	−0.02	−0.07														
Short-Term Debt/Total Assets	−0.11	−0.05	−0.06	−0.01	−0.08													
Long-Term Debt/Total Assets	0.14	−0.21	−0.16	−0.22	0.12	−0.15												
BHAR since IPO	0.25	−0.24	0.32	−0.09	−0.01	−0.05	−0.01											
Excess Return (1 Year)	0.18	−0.18	0.22	−0.03	−0.05	−0.03	−0.03	0.62										
Number of Institutional Owners	0.17	−0.17	0.14	−0.07	−0.06	−0.02	0.06	0.36	0.17									
Total Institutional Ownership	0.25	−0.26	0.05	−0.09	−0.04	−0.11	0.09	0.37	0.21	0.60								
IPO Proceeds	0.06	−0.09	−0.03	−0.06	−0.03	0.05	0.10	0.03	0.00	0.53	0.17							
Total Assets	0.02	−0.04	−0.03	−0.04	−0.04	0.13	0.01	0.04	−0.01	0.34	0.06	0.48						
Intangible Assets/Total Assets	0.07	−0.07	−0.08	−0.13	−0.13	−0.08	0.18	−0.01	−0.05	0.12	0.10	0.10	0.00					
Hot IPO Market	0.00	0.00	−0.01	−0.02	0.05	−0.04	0.01	0.01	0.02	−0.16	−0.14	−0.07	−0.02	−0.07				
Cold IPO Market	0.02	−0.02	−0.01	−0.01	−0.06	0.04	0.03	0.01	0.00	0.24	0.19	0.15	0.05	0.09	−0.34			
Industry Asset Liquidity	−0.04	0.06	0.04	0.00	0.04	−0.05	−0.04	−0.04	−0.04	−0.02	−0.02	−0.03	−0.03	0.05	0.04	−0.04		
VC Backed	−0.17	0.26	0.13	0.31	−0.04	−0.18	−0.19	−0.01	0.01	0.02	0.10	−0.10	−0.06	−0.06	−0.04	0.01	0.06	
High Rank Underwriter	0.08	−0.03	0.06	0.02	−0.07	−0.10	0.08	0.06	0.01	0.36	0.31	0.20	0.07	0.12	−0.08	0.07	0.05	0.17

This table reports Pearson correlation coefficients. The sample is described in Table 1. Variables and the time-matching algorithm are described in Table 2 and Section 3.2.

Table A2
First stage OLS regression: Institutional following.

	Institutional Ownership (1)	Number of Institutional Owners (2)
EBITDA/Total Assets	*11.44****	0.08***
	(0.00)	*(0.00)*
Low Cash Burn Firm	4.61***	0.09***
	(0.00)	*(0.00)*
Q	1.04***	−0.003**
	(0.00)	(0.02)
R&D/Total Assets	11.23***	0.13***
	(0.00)	*(0.00)*
Capex/Total Assets	−24.33***	−0.16***
	(0.00)	(0.00)
Short-Term Debt/Total Assets	−7.42***	−0.14***
	(0.00)	*(0.00)*
Long-Term Debt/Total Assets	13.28***	0.07***
	(0.00)	(0.00)
BHAR since IPO	13.81***	0.09***
	(0.00)	*(0.00)*
Excess Return (1 Year)	−5.37***	−0.02**
	(0.00)	(0.02)
Total Assets	1.83***	0.002***
	(0.00)	(0.00)
Adjusted *R*-Squared	0.259	0.192
N	5995	5995

This table shows estimates of OLS regressions analyzing institutional following after IPO. The sample is described in Table A2; variables and time-matching algorithm are described in Table 2 and Section 3.2. Numbers in parentheses report *p*-values associated with individual coefficients based on heteroskedasticity consistent standard errors.

* Statistical significance at 10%.
** Statistical significance at 5%.
*** Statistical significance at 1%.

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