From IPO to M&A: further evidence

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Abstract

We investigate the acquisition motive for initial public offerings. Specifically, we adopt survival analysis technique in order to examine both the likelihood of the M&A event and its timing relative to the initial public offering of the acquirer firm. Further, we explore why some IPO firms engage in only one acquisition while some others carry out frequent acquisitions over the few years following their IPO. We find that IPO firms with greater underpricing conduct significantly more stock-financed acquisitions in the five years following the IPO. However, if the extent of information asymmetry faced by the target in evaluating the acquirer is high, the underpricing effect loses its significance. Our results also show that IPOs with lower post-IPO insider ownership and venture backed IPOs are more likely to make acquisitions than their counterparts. Further, we find that IPO firms with higher underpricing and proceeds and those with past acquisition activity are more likely to be frequent acquirers.

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1. Introduction

Why some firms go public while others remain private remains an important question in corporate finance. Despite the existence of many theories addressing this question, lack of data on private firms before they are public limits the development of empirical research. Pagano et al. (1998) is one of the few empirical studies that examine the motives for initial public offerings (IPOs). Having access to a unique data set covering accounting information for a large sample of privately and publicly Italian held firms, they find that Italian firms go public in order to rebalance their capital structure after a period of high investment and growth rather than to finance subsequent investment. Zutter et al. (2005) examine how the probability of going public is affected by various bank characteristics and find that banks with higher profits and more leverage are more likely to go public. Other studies have used surveys of corporate executives to test empirically the motivation of going public. For instance, Brau et al. (2006) survey 336 chief financial officers and find that the creation of an acquisition currency and the establishment of market price are the two most important reasons for going public. Based on Brau et al. (2006)'s findings, Celikyurt et al. (2010) explore the acquisition motive for IPOs. Their results show that 84% of firms conduct at least one acquisition within the first five years of the IPO and the typical IPO firm makes six acquisitions in this five-year period. They find that IPO firms with higher proceeds and higher degree of underpricing are more likely to conduct post-IPO acquisitions. Hovakimian et al. (2010) find that 36% of IPOs complete at least one acquisition in the three years following the IPO and, on average, an IPO firm makes two mergers and acquisitions (M&As) within the same time period. Their results confirm that IPOs facilitate subsequent acquisitions giving the cash raised at the IPO as well as the use of overvalued stocks to pay for stock financed acquisitions.

Our paper extends existing literature by examining why IPO firms are prolific acquirers. Specifically, we test three hypotheses that relate IPO characteristics to subsequent M&As activity. According to the acquisition currency hypothesis of Celikyurt et al. (2010), IPO creates publicly traded stock that can be used as a form of payment for acquisitions. This suggests that IPO firms with greater underpricing conduct more stock financed acquisitions. However, Celikyurt et al. (2010) did not consider the level of the

information asymmetry faced by the target when evaluating the IPO acquirer. In fact, an IPO firm may use their overvalued stocks to pay for acquisitions only if the target shows a willingness to accept such offer. Otherwise, the deal would not succeed. In other words, the degree of information asymmetry faced by the target in evaluating the acquirer could decrease the likelihood that an IPO firm with greater underpricing engage in stock-financed acquisition.

Our second hypothesis is related to ownership structure of IPO firms. On one hand, previous IPO literature testing the impact of going public on the post-IPO insider ownership argues that the ownership stake of officers and directors declines significantly following the going public decision. On the other hand, M&As studies show those firms with high level of insider ownership are less likely to acquire. In this paper, we relate the IPO event to the M&A one and investigate, firstly, whether the change in insider ownership after IPO affect the likelihood of making acquisitions in the post-IPO period. Secondly, we address the question whether the level of outside directors in the board structure influences management corporate decisions. Specifically, we examine the role of outside directors in explaining the acquisition activity post-IPO. Given that more than 96% of our IPO acquirers sample hold shares in the target firms, we explore whether shareholder's cross-holdings influence the payment method in post-IPO acquisitions.

Our third hypothesis is related to IPO venture capital backing. Hovakimian et al. (2010) control for IPO venture backing and find that there is no significant relation between venture backing and the likelihood of acquisition. Celikyurt et al. (2010) consider the acquisition volumes by IPO firms and find that venture backed IPOs are significantly less likely to make cash-financed acquisitions and more likely to conduct stock-financed acquisitions. Our study complements these two studies by examining directly the effect of IPO venture backing on the likelihood of conducting acquisitions. Specifically, we analyse the acquisition activity of IPO firms during the lockup period and investigate whether venture backing influence the likelihood of IPO firms to conduct acquisitions during this period.

Our results provide some support for all three hypotheses. Consistent with the acquisition currency hypothesis, we find that firms with higher degree of IPO underpricing conduct more stock-financed acquisitions after the IPO. However, the higher the extent of information asymmetry faced by the target in evaluating the acquirer, the lower the likelihood of stock being used in acquisitions. We find that higher underpricing combined with higher level of information asymmetry leads to a lower probability of making stock-financed acquisitions. Our findings also support the ownership structure hypothesis. We find that lower post-IPO insider ownership is associated with higher probability of IPO mergers and that the level of outside directors is negatively related to the probability of an IPO firm to make acquisition. Investigating the role of cross-holdings in explaining the choice of method of payment in acquisitions by IPO firms, we find that IPO acquirers with high level of cross-holdings are more likely to conduct stock-financed acquisition. Consistent with the predictions of the venture backing hypothesis, we find that the likelihood of venture backed IPOs making acquisitions is higher than non venture backed IPOs and this probability decreases during the lockup period. Our results also show that the longer the lockup period in the first year after IPO is, the higher is the likelihood of a venture backed IPO making an acquisition. Overall, our results suggest that specific IPO characteristics significantly influence not only post-IPO acquisition decision, but also the choice of the method of payment in such events. We also contribute to the IPO and M&A literature by examining the factors leading an IPO firm to be frequent acquirer in the five years following its IPO. Our results show that IPOs with higher level of underpricing and higher proceeds are more likely to engage in frequent acquisitions. Moreover, firm's past acquisition activity affects significantly its likelihood of engaging in additional acquisitions.

The paper is organized as follows. In section II, we review existing theories on the motivation of IPOs and M&As. In section III, we present our hypotheses and empirical predictions. In section IV, we discuss our sample and data. In section V, we present our empirical results and we conclude in section VI.

2. Literature review

The reason of going public to acquire has received the attention of many theoretical studies. Chemmanur et al. (1999) discuss the informational effect on the IPO decision. According to their model, a firm goes public when information gathering costs are low or when a sufficient amount of information about it is already available in the public market. Subrahmanyam et al. (1999) suggest that the public market provides a tradeoff between the duplication costs of information and the information benefits that outside investors, by chance, come across in their day-to-day activities. Their model predicts that firms prefer to go public when the benefit of this information dominates the cost of duplication. Other studies emphasize the importance of liquidity considerations in driving the IPO decision. Amihud and Mendelson (1988) argue that the going public decision can be viewed as a liquidity increasing project undertaken by the firm. Zingales (1995) argues that an IPO can serve as a first step toward selling a company through a takeover at an attractive price. He proposes that the corporate control is an important factor that should be taken into consideration in the decision of going public or not.

Other theoretical studies address the question of why firms engage in M&As activity. Two explanations are advanced to the firm's acquisition decisions: (1) The first, referred to as the neoclassical hypothesis, argues that merger waves occur when firms in industries react to "shocks" in their operating environments. Gort (1969) and Mitchell and Mulherin (1996) suggest that merger waves result from shocks to an industry's economic, technological, or regulatory environment. Shocks could reflect events such deregulations or the emergence of new technologies. Andrade et al. (2001) argue that deregulations are the dominant factor in merger and acquisition activity after the late 1980s and account for nearly half of the merger activity in 1990s. Harford (2005) argues that under the neoclassical hypothesis, once a regulatory, technological or economic shock to an industry's environment occurs, the reaction of firms inside and outside the industry is such that industry assets are reallocated through mergers and partial-firm acquisitions. (2) The second theory, referred to as the behavioral hypothesis postulates that managers use overvalued stock to buy the assets of lower-valued firms. Shleifer and Vishny (2003) suggest that clustering in merger activity is observed because a substantial portion of merger activity is driven by stock market valuations. They point out that bull markets

lead groups of bidders with overvalued stock to use the stock to buy assets of undervalued targets through mergers. Harford (2005) argue that, under the behavioral hypothesis, merger waves will occur following periods of abnormally high stock returns or market-to-book ratios.

Recent empirical studies suggest that IPO and M&As markets are not unrelated. Schultz and Zaman (2001) find that internet IPOs in the late 1990's were followed by series of acquisitions and Rau and Stouraitis (2009) observe that IPO' waves precede merger' waves. Using more than 151,000 corporate transactions over the 25-year period 1980-2004, these authors find a strong and positive correlation between issuance events (IPOs and subsequent equity offerings) and stock-financed acquisitions. They also find that stock issue volume precedes future stock-financed M&A volume confirming that equity issuances and M&A transactions are strongly related. Rosen et al. (2005) explore the going public decision of depository institutions exploiting the requirement of both public and private banks to disclose financial information to regulators. Using a sample of 140 IPOs during the period 1981-2002, they find that banks going public are more likely to become acquirers than their peers. Brau and Fawcett (2006) survey 336 CFOs and show that the creation of public shares for acquisitions and the establishment of market price or value of the firm represent the two most important reasons for going public. They show that 59% of CFO respondents agree indeed with this statement. Brau et al. (2003) argue indeed that an IPO could serve as a channel for creating public shares used as currency in acquiring other companies or being acquired in a stock deal.

The acquisition motive for IPOs has received the attention of few empirical studies. Wiggenhorn et al. (2007) find that newly public firms are more likely to use stock as a currency for acquisitions when the initial return is high in the bubble and non-bubble periods. They also show that IPO firms are more likely to use stock to pay for acquisitions when they are supported with venture capital. Hsieh et al. (2011) propose a model that link a firm's going public decision with its subsequent acquisition activity. They focus on the informational role of IPOs by suggesting that IPOs reduce the valuation uncertainty of the bidder leading to a more efficient acquisition strategy. They also test a number of empirical hypothesis that relate the likelihood and timing of IPOs and M&As to various firm and industry characteristics such as the degree of valuation

uncertainty surrounding a firm, the costs of going public and the valuation surprise realized at the time of an IPO. They find a positive relation between the likelihood of observing a post-IPO merger and the valuation surprise realized at the time of IPO. Additionally, they find that the larger the valuations surprise the shorter the time it takes a newly public firm to conduct an acquisition. Their results also show that higher pre-IPO valuation uncertainty is associated with significantly larger time spans between IPOs and subsequent mergers. Testing the relation between the cost of going public and mergers, they find that the costs of going public are positively related to the likelihood of observing a merger within five years of an IPO.

Celikyurt et al. (2010) analyze the post-IPO acquisition activity of 793 US IPOs issued between 1994 and 2004. They attempt to explain the acquisition volumes by IPO firm by testing three hypotheses: (1) First, IPOs are considered the most important channel of capital infusion. Conducting an IPO will provide companies with high amount of cash which help them to pursue subsequent cash funded acquisitions. According to the capital infusion hypothesis, the primary proceeds from an IPO should be positively related to the amount of cash financed acquisitions following the IPO. (2) The second hypothesis supposes that the IPO is a process that allows firms to pursue acquisitions by using stock as a form of payment. In a public market with information asymmetry between buyers and sellers, the ability to issue overvalued stock to pay an acquisition could provide a motive to conduct an IPO. Under the acquisition currency hypothesis, there are higher amount of stock-financed acquisitions for IPO firms with overvalued stocks. (3) The third hypothesis supposes that IPOs are a mechanism that reduces the uncertainty about the true value of firms conducting acquisitions. Hsieh et al. (2011) suggest that IPO firms that experience a greater reduction in their valuation uncertainty are more likely to engage in acquisitions. According to the uncertainty resolution hypothesis, there are more cash and stock financed acquisitions for IPO firms obtaining greater reduction in their valuation uncertainty. Empirical results show that the volume of cash-financed acquisitions made within four years after the IPO is positively and significantly correlated with IPO proceeds, supporting the first hypothesis. In addition, the analysis shows that the level of underpricing is a positive and significant determinant of stock-financed acquisitions supporting the acquisition currency hypothesis. Their results also show that

the offer price revision is positively correlated with the volume of cash-financed acquisitions and stock-financed acquisitions supporting the uncertainty resolution hypothesis.

Hovakimian et al. (2010) examine how IPOs facilitate acquisitions by testing three hypotheses relating IPOs to subsequent merger activity. (1) The first hypothesis stipulates that IPO facilitates acquisitions by easing access to debt and equity markets. According to the financing hypothesis, an IPO provides a firm with access to the public equity market and enhances its ability to access the public debt market which can be used to raise funds for future acquisitions.(2) The second hypothesis is the market timing hypothesis which stipulates that IPOs facilitate future acquisitions by providing an opportunity to take advantage of favorable stock prices.(3) The third hypothesis supposes that IPO firms benefit from information generated by outside investors and use market prices as a feedback to determine the optimal restructuring strategy. According to the market feedback hypothesis, the probability of an acquisition is positively correlated with stock returns of IPO firms. Using a sample of 2,059 IPO firms conducting 4,265 mergers between 1980 and 2006, their results show some support for all three hypotheses regarding how IPOs facilitate acquisitions. They find that firms with better access to equity financing and debt financing are significantly more likely to conduct acquisitions. In addition, IPO firms with high initial returns are more likely to conduct stock-financed acquisition. The results also indicate that the likelihood of both stock and cash mergers increases with stock returns which is consistent with the market feedback hypothesis.

3. Hypothesis Development and variables construction

A. Acquisition currency hypothesis

As suggested by Celikyurt et al. (2010), initial public offering creates publicly traded stock that can be used by newly public firms as a form of payment for acquisitions. Giving the information asymmetry between bidders and potential targets, the former could issue overvalued stocks to pay for future acquisitions. Shleifer and Vishny (2003) argue that many firms have incentive to exploit overvalued equity when making an acquisition. Their theoretical model shows that firms with overvalued stocks are more likely to conduct an acquisition, survive and grow, while firms with undervalued equity

are more likely to become takeover targets. Wiggenhorn et al. (2007) examine the acquisition activity of over 5,000 US firms that went public during the 1992-2001 time period. They find that newly public firms are more likely to use stock for acquisitions when their initial returns are high. They suggest that IPO firms benefit from the purchasing power of highly valued stock when making acquisitions. Celikyurt et al. (2010) analyse the post-acquisition activity of 1,295 US IPO firms over a 20-year period from 1985 to 2004. They find that firms with greater underpricing conduct significantly more stock financed acquisitions, especially in the first three years after the IPO. Purnanandam and Swaminathan (2004) study the valuation of IPOs using a sample of more than 2,000 US IPOs between 1980 and 1997. They find that IPOs are overvalued at the offer price relative to peer firms. Since IPO underpricing is positively correlated with stock overvaluation, we expect the underpricing's level to be positively related to stock financed acquisition. Hence, our first hypothesis is the following:

H1a: IPO firms with higher underpricing are more likely to make stock financed acquisitions.

Recall that the use of overvalued stocks to pay for acquisitions is closely related to the extent of information asymmetry between buyers and sellers in the M&A market. In fact, the success of a stock-financed acquisition depends on the willingness of the target to accept such offer. When faced an equity offer, the target could realize that IPO firm chooses overvalued stocks to pay for acquisition and thus it could refuse the offer. Chammanur et al. (2009) examine a sample of publicly traded acquirers and targets involved in 817 acquisitions announced between 1978 and 2004. They show that the greater the extent of information asymmetry faced by an acquirer in evaluating a target, the greater the likelihood of a cash offer. Similarly, they find that a higher probability of cash offer is associated with a greater information asymmetry faced by a target when evaluating an acquirer. These results suggest that the choice of the medium of exchange in acquisitions is determined by the private information held simultaneously by the acquirer and the target. Consistent with this view, we consider that the success of a stock financed acquisition is related to the degree of the information asymmetry between the bidder and the target. Our next hypothesis is the following:

H1b: Lower probability of stock financed acquisitions is associated with higher information asymmetry perceived by the target when evaluating the acquirer.

To test these two hypotheses, we use *Underpricing* defined as the price run-up in the first trading day after the IPO and measured as the difference between the first day closing price and the offer price given as a percentage of the offer price. To measure the extent of information asymmetry faced by the target when evaluating the acquirer, we use two proxies. The first one is the number of analysts following the acquirer (*NUMA*). A higher number of analysts implies a lower information asymmetry extent. Bhushan (1989) show indeed that more analysts following indicate that more private information will be disseminated to outside investors. Hongjun et al. (2007) also find that analyst activity leads to higher price information content. The second measure we consider is the standard deviation of analyst forecasts (*STDFOR*). A larger standard deviation implies a less agreement between analysts and consequently a higher level of information asymmetry. These proxies are calculated, as reported by IBES, for the last month of the fiscal year preceding the acquisition announcement.

B. Ownership structure Hypothesis

Previous IPO literature has shown that the transition from private to public ownership via an IPO has a significant effect on the firm's ownership structure. Specifically, previous results have shown that insider ownership, including management ownership, decreases while external blockholders increase at the IPO time and in the post-IPO period. Mikkelson et al. (1997) analyse a sample of 283 U.S. IPOs during the period 1980-1983. They find that the median ownership stake of officers and directors declines significantly from the year before going public to ten years later. Roosenboom et al. (2005) examine the ownership structure of 118 IPOs in Netherlands. They find that management stock ownership declines from 42.5% to 28.6% after the IPO. Alavi et al. (2008) investigate the impact of pre-issue ownership structure on the key decisions surrounding an IPO using 565 Australian firms that went public between 1995 and 2005. They find that the pre-IPO managerial ownership decreases from 46.07% to 30.18% and that new block shareholders ownership emerges, representing 3.62%. Besides the change in the ownership structure, IPOs also drive the dilution of stock ownership that could increase the agency problems

between managers and shareholders. Jensen and Meckling (1976) argue that the interest of managers and other stockholders becomes less closely aligned as manager's stakes decrease and the ownership becomes more dispersed. Post-IPO agency problems are likely to be acute during corporate control events such as acquisitions. In fact, the incentives of managers and shareholders could diverge when a newly public firm decides to make an acquisition. Managers who are afraid of losing control and motivated by managerial entrenchment are more likely to pursue self interest rather than shareholders interest during the acquisition event. Jensen (1986) suggests that managers of firms with large free cash flows are more likely to undertake low-benefit or even value-destroying mergers reducing the value of the firm. To the extent that the funds raised in the IPOs increase the free cash flows available to the firm's managers, conflicts of interest between shareholders and managers tend to be more severe. Bauguess et al. (2009) examine the effect of ownership structure on the firm's likelihood to make an acquisition using S&P500 firms from 1994 to 2005. They find that family owned firms and firms with increased levels of inside ownership are significantly less likely to acquire, and if they do, they destroy shareholder value. Gao and al. (2010) consider a sample of 1,963 firms that conducted an IPO during the period 1997-2000 and find that the presence of founder CEOs lowers the probability of post-IPO acquisition. Taking into account these results, we consider the following hypothesis:

H2a: The likelihood of an IPO firm to make an acquisition is negatively associated with their post-IPO insider ownership.

Furthermore, Bauguess et al. (2009) find that firms with a high level of outside directors are more likely to acquire which is consistent with the monitoring hypothesis. To the extent that an inherent conflict of interest exists between shareholders and managers as a result of the separation of ownership and control, outside directors can protect the interests of shareholders by ensuring that managers pursue effective strategies. In this paper, we consider that the presence of outside directors in the board structure of a newly public firm could mitigate agency conflicts between insiders and shareholders and helps to align their interests about future acquisitions. We predict the following relation between outside directors and the probability of an IPO firm to make an acquisition:

H2b: The likelihood of an IPO firm to conduct an acquisition is influenced by the level of outside directors.

Recent empirical studies emphasize the influence of shareholder cross-holdings on managerial corporate decisions including M&As. Matvos et al. (2008) suggest that institutional shareholders of acquiring companies who hold substantial stakes in the targets are more likely to vote for mergers with negative acquirer announcement returns because they can make up for the losses from the acquirers with the gains from the targets. They point out a conflict of interest between shareholders who hold only shares in the acquirer and the cross-owners. They show that cross-owners are more likely to vote for mergers with negative returns than shareholders holding only shares in the acquirer, but not in the ones with positive returns. Harford et al. (2011) suggest that cross-holdings influence target selection. They find that bidder manager considers their shareholders' cross-holdings when selecting merger targets. Nonetheless, examining whether cross-holdings affect the method of payment in acquisition has been neglected in past empirical studies. In the same vein, we find that 96.52% of bidder institutional shareholders in our IPO acquirers sample have cross-holdings in the target firm. Thus, it will be interesting to evaluate how cross-holdings influence the choice of method of payment in M&As following IPO. This leads to the following hypothesis:

H2c: Cross holdings affect the choice of method of payment in post-IPO acquisitions.

To test the ownership structure hypothesis, we use the change in insider ownership (*CHINS*) as a measure of inside ownership for each IPO firm. Insider ownership change is defined as the difference between post-IPO and pre-IPO inside ownership as reported in the Thomson Financial's SDC New Issue database. The number of outside directors (*NUMOD*) is collected from Corporate Library database (WRDS). It represents the level of outside directors for IPO firms in the quarter-end prior to the bid announcement. The information on cross-holdings comes from the Thomson Reuters Institutional (f13) holdings. There is cross-holding when a bidder shareholder holds shares in the target firm. Our main measure for the cross-ownership is the number of institutional bidder shareholders that also own shares in the target (*NUMCRH*). We also use the total

institutional ownership in the bidder's equity (*BIEQOW*) and the total institutional ownership in the target's equity (*TAREQOW*) to evaluate the impact of these holdings on the choice of the payment method in post-IPO mergers. Further, giving the fact that large shareholders are more likely to have the ability to influence bidder managerial corporate decisions, we consider that large cross-owners may have an effect on the method of payment in acquisitions. We define large cross-owner an institutional shareholder who owns more than 5% in the firm. To test this effect, we consider two variables: (1) *LARBCR*, a dummy variable taken the value of one if there is a large cross-owner in the bidder's equity, and zero otherwise; (2) *LARTCR*, a dummy variable taken the value of one if there is a large cross-owner in the target's equity, and zero otherwise.

C. Venture capital backing hypothesis

Numerous researches have examined the influence of venture capitalist (VC) stock holdings on the IPO firm valuation, the underpricing, and the long term performance. Megginson et al. (1990) examine VC certification role by comparing U.S. VC-backed IPOs to non-VC backed IPOs matched by industry and offering size between 1983 and 1987. They find that the first day returns of VC-backed IPOs are significantly lower than those of non-VC backed IPOs. Barry et al. (1990) suggest that VCs could take an active role in monitoring companies that they have invested since they own significant equity positions and therefore can participate directly in the governance of their portfolio firms. They find that the ownership, the length of board service and the number of venture capitalists invested in the pre-IPO firm are negatively related to IPO underpricing. Gompers et al. (1997) examine the effect of VCs on the long-run performance of newly public firms using a sample of 934 venture-backed IPOs and 3407 non-venture-backed IPOs during the period 1972-1992. They find that VC IPOs outperform non-VC IPOs using equal weighted returns. Masulis et al. (2007) examine the relation between several VC reputation measures and subsequent IPO issuer performance. They confirm that VC reputation affects the long-run performance of IPOs. Ragozzino et al. (2007) consider IPOs as information diffusion mechanism that can help to reduce the information asymmetry between bidders and targets in M&A activities. They suggest that the involvement of a VC at the time of an IPO can signal the quality of an entrepreneurial

firm. They find that the likelihood of being acquired for firms backed by a VC is more than one and a half times the likelihood for firms lacking venture capitalist backing. Consistent with this view, we consider that VCs facilitate post-IPO acquisitions as they provide skills and M&A expertise as well as external relationships that generally a newly public firm need. We predict the following hypothesis:

H3: The likelihood of a newly public firm to make an acquisition following its IPO is greater for VC- backed firms than for non VC- backed ones.

Nevertheless, newly public firms could suffer from the venture capitalists when conflicts of interest arise in the post-IPO period. Previous literature suggests that VCs sell their shares more aggressively than other shareholders at the expiration of the lockup period. Brav and Gompers (1999) examine the price reaction at the time of the lock-up expiration and find that VC backed IPO firms have price declines that are more than 2% greater than non VC firms at lockup expiration. They suggest that VC backed IPOs may be associated with a larger number of shares coming to market on the expiration of the lock-up. Field et al. (2001) examine insider share sales in the year after the IPO using 1,948 lockup agreements in the period from 1988 to 1997. They find that VC investors sell more aggressively than other pre-IPO shareholders. Examining the trading volume and abnormal returns around the expiration date, they find that the three day abnormal return is almost three times larger for venture financed firms than non venture financed firms. They also find that the three day abnormal volume is five times higher for venture backed firms. These results suggest that VCs have incentive to sell their shares quickly after the IPO. To the extent that VCs want to disengage from their relationship with the IPO firm and to cash out rapidly after the IPO, they could discourage any acquisition during the lockup period. Arikan et al. (2009) suggest that the desire of cash out quickly leads venture capitalists to refuse any management decision to take a new activity that could change the risk profile of the newly public firm making its valuation harder. If making an acquisition will change firm's composition and make the share unpredictable, venture capitalists tend to avoid acquisitions that should be made. This lead to the following hypothesis:

H3a: VC backed IPOs are less likely to make acquisitions during the lockup period than non VC backed IPOs.

IPO literature suggests that the lockup period is usually 180 days and it could be more in some cases. Bradley et al. (2001) examine the stock price behavior for 2,529 IPO firms in the period surrounding the lockup expiration during the period 1988 to 1997. They find that the average lockup period length is 224 days and there are 211 firms with a lockup period greater than a year. On the other hand, previous studies show that more than 30% of IPO firms are involved in M&A activity within the first year (Celikyurt et al. (2010), Brau et al. (2010)). These results raise questions about the relation between the likelihood of venture backed firms making an acquisition within the first year of their IPO and the length of the lockup period. We expect that the likelihood of a venture backed IPO firm to make an acquisition in the IPO year is positively associated with the length of the lockup period. Hence, we attempt to test the following hypothesis:

H3b: The likelihood of a venture backed IPO firm making acquisition within the IPO year is positively associated with the length of the lockup period.

To test this hypothesis, we use *VC backed,* a dummy variable that takes the value of 1 if the IPO is backed by a venture capital firm, and zero otherwise. Following Arikan et al. (2009), we construct a continuous measure for the lockup period (*LOCKUP*) by taking the natural logarithm of the number of days between the IPO date and the expiration date.

Besides the primary variables described above, we also include a number of controls that could be related to the likelihood of post-IPO acquisition and the choice between cash or stock as a payment mode. We use total gross proceeds (*Proceeds*) defined as the capital raised at the time of the IPO. We expect that IPO gross proceeds are positively related to cash- financed acquisitions (Celikyurt et al. (2010)). IPO gross proceed is also a proxy for the size of the IPO firm. We include a control for the valuation uncertainty measured by the price revision (*Price revision*) and calculated as the absolute value of the difference between the offer price and the midpoint of the initial filing range normalized by the midpoint of the initial filing range. As suggested by Celikyurt et al. (2010), this variable plays a role in explaining the probability of acquisitions as IPOs reduce in uncertainty

over true firm value. We incorporate the market to book ratio (*MB*) defined as the ratio of market value of equity measured at the end of the year preceding the merger and scaled by the book value of equity. We also control for the use of a prestigious underwriter using the rankings of Loughran and Ritter (2004). We define the variable *Prestige*, a dummy variable that takes the value of one if the IPO's underwriter is in the top tier, and zero otherwise. We use *Industry*, a dummy variable taken the value of one if the target is in the same 3 digit SIC code as the acquirer, and zero otherwise. This variable measures the degree of relatedness between the target and the acquirer. We also include a dummy variable *Private* that takes the value of one if the target is private, and zero otherwise. To capture the increased likelihood of acquisition during periods of industry consolidation, we use the industry-level merger wave (*Merger wave*). This variable is constructed as the number of acquisitions in the industry defined by the two digit SIC and scaled by the total number of industry acquisitions during the sample period. **Table 1** summarizes definitions of all the variables considered and their expected sign.

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4. Data and sample selection:

To construct our initial sample of IPOs and mergers, we use the Thomson Financial's SDC New Issues and Mergers & Acquisitions databases. Using a sample period from 1980 through 2006, our IPO dataset consists of 7,206 U.S. IPOs, excluding ADRs, unit offers and IPOs with offer price under $5. We also exclude financial firms (one-digit SIC 6) and utilities (two-digit SIC 49) from the IPO sample. Our merger sample consists of U.S. completed mergers that were announced between 1980 and 2010. We study mergers and acquisitions by public acquirers in which they hold at least 50% of the target's shares before and at least 90% of the target's equity after the acquisition. We require that the merger transaction value exceeds $1 million. Additionally, we restrict our focus only to acquisitions of private, public and subsidiary targets. The resulting set contains 31,727 acquisitions. Since our objective is to examine the decision to go public and its role in facilitating subsequent merger activity, we collect the data on M&As that take place within a five-year period following the firm's IPO including the IPO year. Thus, merger data are available through the end of 2010 and we end the IPO sample in 2006 to allow us

to track the five-year merger activity for all IPO firms in our sample. Both IPO and merger sets are combined to result in 7,107 mergers made by 3,048 IPOs. We also require that IPO firms have available data in COMPUSTAT. This results in a final sample of 2,547 IPOs involved in 5,858 mergers. The remaining IPO firms did not conduct any acquisition during the five years following the IPO date (4,158 IPOs). Data on asymmetric information measures comes from IBES while the information on institutional ownership comes from the Thomson Reuters Institutional (13f) Holdings database. The sample size varies for various tests and hypothesis due to the availability of necessary data items.

Table 2 reports descriptive statistics for the IPO sample. The number of IPOs in our sample and the total proceeds raised vary over time. Higher levels are observed especially during the Internet bubble (1999-2000). For the whole sample, we calculate an average underpricing level of 21%. This average is influenced heavily by the 1999-2000 period, where underpricing level averaged 65%. Excluding these two years, the average underpricing in the sample drops to 13%.

***** Insert Table 2 about here *****

Table 3 presents descriptive statistics about the M&As sample. A large number of acquisitions occurred between 1994 and 2000 with an average of 1,907 acquisitions. The total acquisition amount reached its higher level in 1999 and 2000, which coincide with the highest IPO proceeds. As Rau and Stouraitis (2008) and Hovakimian and Hutton (2010) point out, this result suggests that IPO waves are followed by an increase in the aggregate merger activity. **Figures 1** and **2** confirm our observation.

***** Insert Table 3, Figure 1 and Figure 2 about here *****

Table 4 summarizes the acquisition activity undertaken by IPO firms for windows extending out to five years after the IPO date. Year 0 denotes the year of the IPO. We observe that 21% of IPO firms make at least one acquisition in their IPO year and 47% of IPO firms make at least one acquisition one year after their IPO. These results confirm those of Celikyurt et al. (2010) and Brau et al. (2010) that a significant number of firms

becomes acquirers shortly after the IPO. Moreover, we find that many firms make more than one acquisition within five years following their IPO. The average number of acquisitions by an IPO firm is 2.33, while the median number of acquisitions in the five first years after going public is 2. In **Table 4**, we also present frequent acquisitions year by year. We define frequent acquirer, an IPO firm that conducts at least two acquisitions in a given year. We find that 30.22% of IPO firms conduct more than two acquisitions in the year after the IPO. This percentage varies between 24.18% and 27.77% in the following years suggesting that IPO firms tend to be frequent acquirers in the short period following their IPOs.

***** Insert Table 4 about here *****

Figure 3 shows aggregate acquisitions, aggregate IPOs and IPOs making acquisitions by industry. We observe that, in manufacturing and services industry groups, IPO firms make more acquisitions than the other industries.

***** Insert Figure 3 about here *****

5. Results

In this section, we first discuss the summary statistics and conduct univariate tests to determine if there are any differences in means and medians between IPOs making acquisitions and IPOs not making acquisitions in one hand, and between stock-financed acquisitions and cash-financed ones, in the other hand. Second, we run a series of logit regressions to test our hypotheses. Third, we adopt survival analysis techniques to investigate both the likelihood of the M&A event and its timing relative to the IPO event. Finally, we examine the determinants of frequent acquisitions by IPO firms.

A. Univriate results

Panel A of **Table 5** presents the summary statistics for IPO firms making acquisitions and IPO firms not making acquisitions during the five years following their IPO and the tests of differences in means and medians between the two groups. We find that IPOs making acquisitions in the five years following their IPO are significantly more underpriced than IPOs not making acquisitions. The mean underpricing of IPO firm

making acquisitions is 32%, whereas it is 18% for IPO firms not making acquisitions. We find that change in insider ownership post-IPO is significantly higher for IPOs making acquisitions compared to those not making acquisitions. Specifically, we find that insider ownership drop sharply post-IPO for IPOs acquirers (an average of - 0.22) than IPOs not involved in mergers following the first five years following the IPO date (an average of -0.17). These results are in line with our hypothesis that IPOs with lower insider ownership are more likely to make acquisitions. Further, IPOs making acquisitions include more cross-owners than IPOs not making acquisitions. Our results show that there is a significant difference in means and medians between the two groups. We also find that IPOs making acquisitions have significantly higher cross-ownership in the acquirer's equity and the target's equity than IPOs not making acquisitions. The mean cross-ownership in the target's equity for IPOs acquirer is 0.17 whereas it is 0.08 for IPOs non acquirer. Additionally, our univariate analysis shows that the differences in means and medians for the *LARTCR* variable (proxy for the presence of a large cross-owner in the target's equity) between IPOs making acquisitions and those not making acquisitions are statistically significant.

Panel B of **Table 5** presents summary statistics for cash and stock acquisitions and the tests of differences in means and medians between the two groups. We find that underpricing is significantly higher for IPOs making stock acquisitions than those making cash acquisitions. The mean underpricing of IPO acquirers in stock acquisitions is 45% whereas it is 25% for IPO acquirers in cash acquisitions. The mean proceeds raised at the IPO date is significantly higher for IPOs conducted cash acquisitions than those conducted stock acquisitions, supporting the capital infusion hypothesis of Celikyurt et al. (2010). IPOs in stock acquisitions have significantly higher market to book ratio and smaller firm size than IPOs in cash acquisitions. Our results also suggest that IPO firms are more likely to pay for private target with stock.

Panel B of **Table 5** compares the means and medians of our proxies for information asymmetry. We find that *NUMA* is significantly higher for stock acquisitions than for cash acquisitions. The mean of number of analysts following the target is 6.60 for stock acquisitions, whereas it is 5.40 for cash acquisitions. Our results indicate that acquirers in stock acquisitions have larger standard deviation of analysts forecast (*STDAF*) than

acquirers in cash acquisitions. This difference is however statistically significant in means, but not in medians.

*** Insert **Table 5** about here ***

B. Determinants of the post-IPO acquisition activity

In this section, we estimate a series of regressions to test our three hypotheses. First, we run a logit regression to test if the underpricing has an effect on the probability of an IPO firm to make an acquisition. We also run a multinomial logit regression to evaluate the role of underpricing in determining the probability of an acquisition over five years period starting by the IPO year (year 0) and ending four years after the IPO date. **Table 6** reports the results of the following regression:

$$Y_i = \beta_0 + \beta_1 Underpricing_i + \beta_2 Proceeds_i + \beta_3 Price\ reviison_i + \beta_4 MB_i + \beta_5 Prestige_i + \varepsilon_i \qquad (1)$$

In Panel A, the dependant variable in regression (1) takes the value of one if an IPO firm makes at least one acquisition during the five years following its IPO. We find a positive and statistically significant relationship between the underpricing and the probability of an IPO firm to make an acquisition. That is, IPO firms with higher underpricing are more likely to involve in M&A transaction. To the extent that the underpricing is a very short event, we attempt to examine this variable in greater depth by estimating a multinomial logit model. In Panel B, the dependant variable in regression (1) takes the value of 0 if there is no acquisition in the five years following the IPO date, 1 if the IPO firm makes acquisition in the IPO year (year 0), 2 if there is an acquisition one year after the IPO date, 3 if the IPO firm makes an acquisition two years after the IPO date, 4 if there is an acquisition three years after the IPO date and 5 if the acquisition is made four years after the IPO date. The results are reported in Panel B of table 5. We find that the coefficient of underpricing is positive and statistically significant in year 0 and year 1(the IPO year and one year after the IPO), but this result does not hold when we stretch the event window to two years, three years and four years after the IPO indicating that any effect of the underpricing is short lived.

***** Insert Table 6 about here *****

C. Determinants of stock-financed acquisitions

In this section, we test the predictions of the acquisition currency hypothesis by modeling the method of payment as a function of underpricing (our proxies for the extent of information asymmetry faced by the target when evaluating the acquirer) as well as several control variables. We also include the interaction effect of the underpricing with each proxy for the extent of information asymmetry about the acquirer. We run logit regressions for each year following the IPO date (from year 0 to year 4) as well as for the whole period (year 0 to 4). Our general model is the following:

$$Y_{it} = \beta_0 + \beta_1 Underpricing_{it} + \beta_2 Price\ revision_{it} + \beta_3 Proceeds_{it} + \beta_4 + \beta_5 Prestige_{it} + \beta_6 Private_{it} + \beta_7\ Merger\ wave_{it} + \beta_8\, MB_{it} + \beta_9 NUMA_{it} + \beta_{10} STDFOR_{it} + \beta_{11} Underpricing * NUMA_{it} + \beta_{12} Underpricing * STDFOR_{it} + \varepsilon_{it} \quad (2)$$

We use Heckman method for correcting for sample selectivity bias to estimate regression (2). In the first stage, we use a probit model to estimate the selection equation based on whether the IPO firm acquire or not in the five years following the IPO. In the second stage, we estimate the regression (2) adding the inverse Mills ratio. The results are presented in **Table 7**. We find that firms with higher degree of IPO underpricing conduct more stock-financed acquisitions after the IPO. The level of underpricing is a positive and statistically significant determinant of stock-financed acquisitions at 5% level within the IPO year and one year after the IPO. However, IPO underpricing is not statistically significant in explaining stock-financed acquisitions within two, three and four years after the IPO, although we find a statistically significant effect in the two first models (colomn (1) and (2)) for three years after the IPO. Our results suggest that IPO underpricing is unlikely to be a significant driver of stock-financed acquisitions in later years. These results are also consistent to those reported in Panel B of **Table 5**.

Turning to our proxies of the extent of information asymmetry about the acquirer, we find different results across time intervals. The results for the IPO year show that the coefficient of *STDFOR* is negative and statistically significant at 5% level and those of *NUMA* is positive but not statistically significant. This implies that the higher the level of information asymmetry about the acquirer, the lower the likelihood of stock being used in acquisitions supporting the hypothesis H1b. The coefficients of the interactive variables

*NUMA*Underpricing* and *STDFOR*Underpicing* also confirm our hypothesis. Higher underpricing combined with a large number of analysts following the acquirer increases the probability of stock- financed acquisitions. However, higher underpricing combined with a large standard deviation of analysts forecast lead to a lower probability to make stock- financed acquisition. Thus, even with a high level of underpricing. IPO firm are less likely to make stock- financed acquisitions if there is a greater extent of information asymmetry about the acquirer. We also find that the coefficients of *NUMA* and *NUMA*Underpricing* are positive and statistically significant at the 1% level one year and three years after the IPO as well as in 0-4 years window. Our results also show that the total proceed raised at the time of the IPO is negatively related to the probability of stock-financed acquisitions over horizons ranging from the IPO year to four years following the IPO date. This implies that IPO firms with higher proceeds are more likely to make cash-financed acquisitions supporting the capital infusion hypothesis of Celikyurt et al. (2010).

Further, we find that the coefficient of *Private* is positive and statistically significant in most years windows, indicating that IPO firms prefer to use stock for private targets (Chang. 1998). We also find that in period of merger waves, IPO firms are more likely to make stock-financed acquisitions. The coefficient of *Merger wave* is statistically significant at the 1% significance level for almost all years window.

***** Insert Table 7 about here *****

D. Post-IPO acquisitions and ownership structure

In this section, we examine the ownership structure hypothesis by testing the following model:

$$Y_i = \beta_0 + \beta_1 Proceeds_i + \beta_2 Prestige_i + \beta_3 Price\ revision_i + \beta_4 MB_i + \beta_5 INSIDERS\ LESS\ 50\%_i + \beta_6 CHINS_i + \varepsilon_i \quad (3)$$

Panel A of **Table 8** presents results for regression (3). We are interested on insider ownership defined as the percentage of ownership by executive officers and directors. We find a negative and statistically significant relationship between *CHINS* and the probability of making acquisitions within 5 years following the IPO date at the 1% level.

This suggests that a negative change in insider ownership is associated with a higher probability of IPO mergers which provides a support for our H2a hypothesis. We also confirm this result using another proxy for post-IPO insider ownership. Column 2 of table 7 presents regression results where the ownership structure is measured by the variable *INSIDERS LESS THAN 50%*, a dummy variable that takes the value of one if the firm insiders hold less than 50% of the company post -IPO, and zero otherwise. We find that IPO firms with insiders ownership less than 50% are more likely to make acquisitions.

Panel B of **Table 8** reports the results of multinomial logit analysis to test whether changes in insider ownership after IPO affect the probability of acquisition in the IPO year and one, two, three and four years after the IPO date. We find that *CHINS* is negatively related to the probability of making an acquisition for the different years windows. This suggest that a higher decline of insider ownership after the IPO leads to a higher probability of acquisitions not only in the IPO year, but also over time intervals up to five years after the going public date.

***** Insert Table 8 about here *****

We also examine the effect of the level of outside directors in the board structure on the likelihood of acquiring. We run the following regression:

$$Y_i = \beta_0 + \beta_1 Proceeds_i + \beta_2 Prestige_i + \beta_3 Price\ revision_i + \beta_4 MB_i + \beta_5 NUMOD_i + \beta_6 INSIDERS\ LESS\ 50\%_i + \beta_7 CHINS_i + \varepsilon_i \quad (4)$$

Table 9 presents the results of the regression (4). We find that the level of outside directors is negatively related to the probability of an IPO firm to make acquisition. Column 1 of table 8 shows that the coefficient of *NUMOD* is negative and statistically significant at the 1% level and the coefficient of *CHINS* is negative but not significant. A similar conclusion can be drawn from column 2, where insider ownership is measured by *INSIDERS LESS 50%*. This evidence is consistent with our H2b hypothesis.

***** Insert Table 9 about here *****

We further investigate the role of cross-holdings in explaining the choice of method of payment in acquisitions by IPO firms by running the following regression:

$$Y_i = \beta_0 + \beta_1 Proceeds_i + \beta_2 Prestige_i + \beta_3 Price\ revision_i + \beta_4 Industry_i + \beta_5 Merger\ wave_i +$$

$$\beta_6 NUMCRH_i + \beta_7 BIEQOW_i + \beta_8 TAREQOW_i + \beta_9 LARBCR_i + \beta_{10} LARTCR_i + \varepsilon_i \quad (5)$$

We estimate the regression (5) using Heckman method for correcting for sample selectivity bias. In the first stage, we use a probit model to estimate the selection equation based on whether the IPO firm acquire or not in the five years following the IPO. In the second stage, we add the inverse Mills ratio to our explanatory variables in model (5) and estimate it using logit procedure. **Table 10** presents estimation results for the regression (5) where the dependant variable is one if the acquisition was by stock and zero if it was by cash. We find that the probability of stock-financed acquisition is positively and statistically related to the number of cross-holdings at the 1% level. This implies that the higher the number of bidder institutional owners that also own shares in the target, the higher the probability of an IPO firm to conduct a stock-financed acquisition. Columns 2 and 3 show that the higher the percentage of shares held by bidder cross-owners (*BIEQOW*), the higher is the probability of stock-financed acquisition, although this relation is not statistically significant. A similar conclusion is found between the number of shares held by target cross-owners (*TAREQOW*) and the likelihood of stock-financed acquisition. However, this relation is significant at the level of 5%. This result suggest that target institutional cross-shareholders who own a larger percentage of shares in the target prefer to receive shares of stock rather than cash in a merger transaction in order to increase their ownership and obtain influence in the combined firm. Further, we attempt to test whether a larger cross-owner in the acquirer or target's equity may influence the choice of method of payment in mergers. Columns 4 and 5 of **Table 10** show that having a large cross-owner in the acquirer's equity influence positively, but not significantly on the probability of choosing stock as mode of payment. However, there is a positive and significant relationship between the existence of large cross-owner in the target's equity and the likelihood of stock-financed acquisition at 5% significance level. These results indicate that large cross-shareholders play a role in choosing the method of payment in M&As.

To summarize, the results in **Table 10** show that institutional shareholders of acquiring companies who hold substantial stakes in the targets have an influence on choosing stock as method of payment in M&As. Having a large ownership and being a large cross-owner

also increase the probability of an IPO firm to make stock-financed acquisition. We hence confirm hypothesis H2c.

***** Insert Table 10 about here *****

E. Venture backing and post-IPO acquisitions

Next, we turn to examine the VC backing hypothesis. We consider the following regression:

$$Y_i = \beta_0 + \beta_1 VC\ backed_i + \beta_2 Proceeds_i + \beta_3 MB_i + \beta_4 Prestige_i + \beta_5 Price\ revision_i + \beta_6 LOCKUP_i + \beta_7 VC\ backed * Prestige_i + \beta_8 VC\ backed * LOCKUP_i + \varepsilon_i \quad (6)$$

Table 11 presents the estimation results for regression (6), where the dependant variable takes the value of one if an IPO firm conduct acquisitions within five years following the IPO, and zero otherwise. Column 1 of Panel A shows that VC backed IPOs are more likely to conduct acquisition than non VC backed IPO in the five years following the IPO. The coefficient of *VC backed* is positive and statistically significant at the 1% level, which confirms H3a hypothesis.

By definition, during the lockup period, company insiders are forbidden to sell any of their shares. Consequently, IPO firms are restricted to make corporate events during this period. Hence, we expect that the probability of making an acquisition is negatively related to the lockup period. Column 2 of panel A show that the coefficient of *LOCKUP* is negative and statistically significant at 1% level indicating that IPO firms are less likely to make acquisitions during the lockup period. To the extent that VC backing and lockup period are complements since the earliest possible time the venture capital tends to dispose of their stakes is when the lockup agreement expires, we explore whether lockup period interacts with VC backing. Column 4 of panel A show that the probability of VC backed IPOs to make an acquisition is significantly and negatively related to the lockup period. This implies that a longer lockup period decreases the likelihood of a venture backed IPO to conduct an acquisition during the five years following its IPO. Further, given that VC backing and underwriter reputation are positively correlated, we attempt to test whether their interaction term influence the probability of making an acquisition. The results in column 3 of panel A show that the coefficient of *VC backed*Prestige* is positive and statistically significant, indicating that VC backed IPOs followed by a

prestigious underwriter are more likely to make acquisitions within five years following their IPO. A multinomial analysis reported in Panel B of **Table 11** demonstrates that the effect of VC backing on the probability of an IPO firm to conduct an acquisition varies from a period to another. The results show that there is no evidence of significant effect on the IPO year and two years after the IPO, whereas there is a positive and significant relationship between VC backing and the probability of making an acquisition in one, three and four years after the IPO.

***** Insert Table 11 about here *****

In **Table 12**, we test the determinants of an acquisition by an IPO firm during the lockup period. We run the regression (6) where the dependant variable takes the value of one if an IPO firm makes an acquisition during the lockup period, and zero otherwise. We use Heckman procedure to correct for the selection bias since we are interested only on acquirer IPOs. In the first stage, we use a probit model to estimate the selection equation based on whether the IPO firm acquire or not in the five years following the IPO. In the second stage, we add the inverse Mills ratio to our explanatory variables in model (6) and estimate it using logit procedure. The results show that VC backed IPOs are less likely to make acquisition during lockup period than non VC backed IPOs, supporting the H3b hypothesis. We also find that the longer the lockup period is, the higher is the probability of an IPO firm to make an acquisition during the lockup period. This implies that longer lockup period may increase the confidence of investors about the quality of decisions made after the IPO and encourage IPO firm to make corporate decisions such as acquisitions. We therefore test whether venture backed IPOs are more likely to make acquisitions during the lockup period using the interaction term between *VC backed* and *LOCKUP*. We find a positive and significant relationship between the interaction term and the probability of making an acquisition during the lockup period, supporting our hypothesis.

***** Insert Table 12 about here *****

Further, we examine the relationship between venture backing and lockup period and their effect on the probability of an acquisition in the IPO year since the average lockup period is 180 days. The results in **Table 13** show that the coefficient of *VCBACK* is

positive but not statistically significant. We also find that the longer the lockup period is, the higher is the probability of an IPO firm to make an acquisition in the IPO year. The interaction term's coefficient is positive and significant at the 5% level indicating that venture backed IPOs are more likely to make acquisition in the IPO year when the lockup period is long which provide a support for our H3c hypothesis.

***** Insert Table 13 about here *****

F. Acquisitions by IPO firms: Survival analysis

Few empirical studies attempt to relate the likelihood of M&A event of IPO firms and its timing relative to the initial public offering of the acquirer firm to various firm characteristics. Hiesh et al. (2009) propose a model that links the IPO decision with its subsequent takeover strategy. They are interested in the likelihood and timing of post-IPO mergers and they find that the time it takes a newly public firm to attempt an acquisition of another firm is increasing in the degree of valuation uncertainty prior to the firm's IPO and is decreasing in the valuation surprise realized at the time of the IPO. Ragozzino et al. (2007) use a survival analysis to explain why some IPO firms are acquired after going public. They find that VC backing, investment bank reputation and underpricing jointly influence the likelihood and timing of post-IPO acquisitions of entrepreneurial firms. In this section, we rely on a survival analysis technique in order to investigate both the likelihood of an acquisition by IPO firm and its timing relative to its IPO. The model estimation is done by method of partial likelihood using the proportional hazards model proposed by Cox (1972). The Cox model is a statistical technique for analysing survival data that does not require the specification of an underlying distribution. Its main assumption is that the hazard function of firm i is a multiple of an unspecified baseline hazard function. The basic model assumes the following form:

$$h_i(t) = \lambda_0(t)\exp\{\beta_1 x_{i1} + ... + \beta_k x_{ik}\} \quad (7)$$

Where $\lambda_0(t)$ is the baseline hazard function and the second part of the equation is the exponentiated set of covariates.

The regression model is the following:

$$Y = \beta_0 + \beta_1 Underpricing + \beta_2 VC\ backed + \beta_3 Price\ revision + \beta_4 Proceeds + \beta_5 MB$$
$$+\beta_6 Prestige + \beta_7 CHINS + \beta_8 INSIDER\ LESS\ 50\% + \varepsilon \quad (8)$$

Table 14 reports our survival analysis results for regression (8). Firstly, we test each hypothesis described above separately. Secondly, we test the full model which includes all the explanatory variables relative to our three hypotheses. In column 1, we test the effect of IPO underpricing on the likelihood and timing of an acquisition event. We find that IPO with higher underpricing are more likely to make acquisition. More specifically, the likelihood of making an acquisition for firm with higher underpricing is more than 1.23 ($e^{0.21}$) times the likelihood for firms with lower underpricing. Column 2 shows that VC backed IPOs are more likely to make acquisitions than their counterparts. The coefficient of VC backed is positive and significant at the 1% significance level. In column 3 and 4, we test the relation between the likelihood of post-IPO acquisition and the post-IPO ownership structure. We find that IPOs with lower post-IPO insider ownership are more likely to make acquisitions. Our results show that the likelihood of making acquisition by IPOs with lower post-IPO insider ownership is more than four times ($4.43 = e^{1.49}$) the likelihood for firms with higher post-IPO insider ownership.

The results of the full model are reported in column 5 of **Table 14**. We draw the same conclusions when we combine all the explanatory variables in the same model. We find that VC backed IPOs with higher underpricing and lower post-IPO insider ownership are more likely to make acquisitions than their counterparts.

***** Insert Table 14 about here *****

G. Determinants of frequent acquisitions by IPO firms

Empirical results of previous studies suggest that IPO firms tend to be frequent acquirers in the short period after the going public decision. Celikyurt et al.(2010) argue that 77% of firms conduct at least one acquisition within the five first years of the IPO, and the typical IPO firm makes four acquisitions in this five-year period. Hovakimian et al. (2010) show that many firms make more than one acquisition after the IPO, averaging slightly over two mergers per firm. The statistics descriptive of our sample confirm indeed this evidence. The results in Table 6 show that more than 54% of IPO firms

conduct more than two acquisitions in the IPO year and one year after the IPO. The natural question to ask at this point is why some IPO firms engage in only one acquisition while some others carry out serial acquisitions over the few years following their IPO? In this section, we examine the determinants of frequent acquisitions of initial public offerings. Following Billet et al. (2008), we define frequent acquirer an IPO firm announcing at least two acquisitions within five years following the IPO. Based on this definition, our initial sample of 2547 IPO acquirers includes 1350 frequent acquirers making 4583 acquisitions in the five years following the IPO. The remaining IPO firms (1197) constitute our single acquirers sample. The sample size varies for various tests due to the availability of necessary data items.

We investigate the effect of IPO characteristics on the acquisition activity after the IPO. The agency theory of Jensen (1995) suggests that managers use overvalued equity to make value-destroyed acquisitions to sustain the overvaluation. Hutton et al. (2010) consider that not only equity issuance documents market timing patterns, but also acquisition activity can be driven by market valuations. They retain the market timing hypothesis which states that IPOs facilitate future acquisitions by providing an opportunity to take advantage of favorable stock prices and make acquisitions on more attractive terms. Specifically, they find that overpricing resulting in high IPO underpricing and post-IPO returns increase the likelihood of acquisitions, suggesting that market timing is a stronger factor in acquisitions. Thus, IPO underpricing would influence positively the likelihood of being frequent acquirer.

We also expect that IPO firm with high proceeds are more likely to be frequent acquirer giving the fact that funds raised in the IPOs increase the free cash flows available to the firm. According to the free cash flow theory of Jensen (1986), managers of high free cash flow firms are more likely to invest it in even value-destroying mergers rather than pay it out to shareholders. Further, IPOs followed by a prestigious underwriter would also be frequent acquirer. IPO literature demonstrates that high prestige underwriter with valuable reputation and superior information about the issuing firm's prospects can credibly certify the value of issues that they underwrite (Chemmanur et al. (1999)). When choosing an underwriter, an IPO firm consider its effectiveness services not only at the time of the IPO, but also during the post-IPO period. In particular, the underwriter

services would be useful when the issuing firm considers making acquisitions following its IPO. Arikan et al. (2010) argue that an acquisition advisor served as lead underwriter may reduce search costs when matching the newly public acquirer with target firms, reduce information asymmetry between the IPO acquirer and the target and provide superior technical and financial expertise in merger negotiations. Thus, we also expect that IPO firms that retain their lead underwriter as acquisition advisor increase their probability to frequently acquire.

Table 15 reports descriptive statistics and Univariate tests for single and frequent IPO acquirers respectively. The results show that frequent IPO acquirers have significantly higher proceeds and high level of underpricing than single acquirers. The mean underpricing of single IPO acquirers is 28% whereas it is 35% for frequent IPO acquirers. This difference is significant at 10% level. We also find that IPO firms where the underwriter plays the same role as the acquisition advisor are more likely to be frequent acquirers. The differences in means and medians are significant at the 5% level.

***** Insert Table 15 about here *****

We then run the following multivariate logit regression where the dependant variable takes the value of one if the IPO firm makes at least two acquisitions within five years of the IPO, and zero otherwise.

$$Y_i = \beta_0 + \beta_1 Underpricing_i + \beta_2 Proceeds_i + \beta_3 Prestige_i + \beta_4 VC\ backed_i + \beta_5 MB_i$$
$$+\beta_6 Price\ revision_i + \beta_7 ADVISOR_i + \beta_8 ADVISOR * prestige_i + \varepsilon_i \quad (9)$$

The results of estimation of regression (9) are reported in **Table 16**. We find that the coefficient of *Proceeds* is positive and statistically significant at the 5% level suggesting that IPO firms with higher proceeds are more likely to frequently acquire. We also find that IPO firms that retain their underwriter as acquisition advisor are significantly more likely to be frequent acquirer. We test whether an IPO followed by a prestigious underwriter who also acts as an acquisition advisor tends to be frequent acquirer. The coefficient of the interaction term *ADVISOR*Prestige* is positive and statistically significant at the 5% level however the underpricing variable is positive but not statistically significant, indicating that the level of underpricing seems to have no effect

on the likelihood of being frequent acquirer. Meanwhile, giving the fact that IPO underpricing is a short time period event (calculated in the first trading day after the IPO), we reexamine its effect on the likelihood of an IPO firm to be frequent acquirer including only a one-year time window for acquisition after the firm's IPO. The result reported in column 3 of **Table 16** shows that underpricing increases significantly the probability of an IPO firm to frequently acquire in the first year after the IPO.

***** Insert Table 16 about here *****

Billet et al. (2008) examine the effect of previous acquisition activity in explaining future acquisitions. Using a panel dataset of 99.807 firm-year observations during the period 1985-2002, they point out the importance of past acquisition activity in predicting future acquisitions. Given the importance of previous acquisition activity in explaining future acquisitions, we construct a panel dataset of 1360 IPO acquirers over the first five years of the IPO. Our dataset consists of 5346 firm-year observations. We then estimate the following model where the dependant variable in the logit analysis takes the value of 1 if the IPO firm conducts an acquisition in any year during the five year period and zero otherwise.

$$Y_{it} = \beta_0 + \beta_1 PREACQ_{it} + \beta_2 Procceds_{it} + \beta_3 Underpricing_{ti} + \beta_4 VC\ backed_{it} + \beta_5\ Prestige_{it} + \beta_6 MB_{it} + \varepsilon_{it} \quad (10)$$

Colomn 4 in **Table 16** reports our estimation results for regression (10). We find that the coefficient of *PREACQ* is positive and statistically significant at the 1% level, indicating that IPO firms with acquisition experience are more likely to engage in additional acquisitions.

6. Conclusion

In this paper, we investigate the acquisition motive for newly public firms. Our result suggests that IPO underpricing have a significant effect for the IPO year and one year after the IPO. However, it loses significance for the longer windows that extend to two years after the IPO date and beyond. When we consider the extent of information asymmetry faced by the target when evaluating the IPO acquirer, we find that higher level of information asymmetry decrease the likelihood of an IPO firm to conduct stock financed acquisition. Contrary to Celikyurt et al. (2010), our results show that high underpricing combined with high level of information asymmetry between target and IPO acquirer leads to a lower probability to engage in stock-financed acquisition. We also find that post-IPO insider ownership significantly influence the acquisition activity after IPO. Our findings support the view that IPO firms with high post-IPO insider ownership are less likely to engage in M&A activity, not only in the IPO year, but also over time intervals up to five years after the IPO. We also show that firms with high level of outside directors are less likely to make acquisitions, which suggests that the monitoring role played by outside directors restricts managers to undertake value-destroyed acquisitions often observed in firms with high level of free cash flow such as IPOs. Further, we find that cross-holdings influence the likelihood of stock-financed acquisitions and that having a large cross-owner in the target's equity also influence positively the likelihood of stock-financed acquisition. When we examine the role of IPO VC backing in explaining the likelihood of M&A events following IPO, we find that VC backed IPOs are more likely to conduct acquisition than non VC backed IPO in the five years following the IPO. This probability decreases during the lockup period, suggesting that venture capitalists avoid any acquisition during the lockup period as their objective is to disengage from their relationship with the IPO firm and to cash out rapidly after the IPO. Nevertheless, our results show that longer lockup period encourages venture backed IPOs to make acquisitions during the IPO year. We also find that IPO firms with higher proceeds, IPOs where the underwriter acts as acquisition advisor and IPO firms with acquisition experience are significantly more likely to be frequent acquirers after the IPO, while the likelihood of being frequent acquirer is increasing with the level of underpricing in the first year after the IPO.

References

Alavi, A., P. Kien Pham, and T. My Pham, 2008, "Pre-IPO ownership structure and its impact on the IPO process," *Journal of Banking and Finance* 32, 2361-2375.

Amihud, Y. and H. Mendelson, 1988, "Liquidity and Asset Prices: Financial Management Implications," *Financial Management* 17, 5-15.

Andrade, G., M. Mitchell, and E. Stafford, 2001, "New Evidence and Perspectives on Mergers," *Journal of Economic Perspectives* 15, 103-120.

Arikan, A. and L. Capron, 2010, "Do newly public acquirers benefit or suffer from their pre-IPO affiliations with underwriters and VCs?" *Strategic Management Journal* 31, 1257–1289.

Barry, C., C. Muscarella, J. Peavy, and M. Vetsuypens, 1990, "The role of venture capital in the creation of public companies: Evidence from the going-public process," *Journal of Financial Economics* 27, 447-472.

Bauguess, S. and M. Stegemoller, 2009, "Corporate governance structure and the value of acquisition activity," *Working paper*.

Billett, M. T. and Y. Qian, 2008," Are Overconfident CEOs Born or Made? Evidence of Self-Attribution Bias from Frequent Acquirers," *Management Science* 54, 1037-1051.

Bhushan, R., 1989, "Firm characteristics and analyst following," *Journal of accounting and economics* 11, 255–274.

Bradley, D.J., B.D. Jordan, I. Roten, and H.C. Yi, 2001, "Venture capital and IPO lockup expiration: An empirical analysis," *Journal of Financial Research* 24, 465-493.

Brau, J., B. Francis, and N. Kohers, 2003, "The Choice of IPO Versus Takeover: Empirical Evidence," *Journal of Business* 76, 583-612.

Brau, J. and S. Fawcett, 2006, "Initial Public Offerings: An Analysis of Theory and Practice," *Journal of Finance* 61, 399-436.

Brav, A. and P. Gompers, 1997, "Myth or reality? The long-run underperformance of initial public offerings: Evidence from venture and non venture capital-backed companies," *Journal of Finance* 52, 1791-1821.

Brav, A. and P.A. Gompers, 1999, "Insider trading subsequent to Initial Public Offerings: Evidence from expirations of Lock-Up provisions," *Working paper*.

Celikyurt, U., M. Sevilir, and A. Shivdasani, 2010, "Going public to acquire: The acquisition motive for IPOs," *Journal of Financial Economics* 96, 345–363.

Chemmanur, T. and P. Fulghieri, 1999, "A theory of the going public decision," *Review of Financial Studies* 12, 249-279.

Chemmanura, T.J., I. Paeglisb, and K. Simonyan, 2009, "The medium of exchange in acquisitions: Does the private information of both acquirer and target matter?" *Journal of Corporate Finance* 15, 523–542.

Field, L.C. and G. Hanka, 2001, "The expiration of IPO share lockups," *Journal of Finance* 56, 471-500.

Gao, N. and B. Jain, 2012, "Founder management and the market for corporate control for IPO firms: The moderating effect of the power structure of the firm", *Journal of Business Venturing* 27, 112-126.

Gort, M., 1969, "An economic disturbance theory of mergers," *Quarterly Journal of Economics* 83, 624-642.

Harford, J., 2005, "What drives merger waves?" *Journal of Financial Economics* 77, 529-560.

Harford, J., D. Jenter, and K. Li, 2011, "Institutional cross-holdings and their effect on acquisition decisions," *Journal of Financial Economics* 99, 27–39.

Hongjun, Z., H. Xianjie, and T. Lin, 2007, "Can securities analysts improve the efficiency of capital market in china: empirical evidence based on stock price synchronicity and stock price informativeness," *Journal of Financial Research* 30, 110–121.

Hovakimian, A. and I. Hutton, 2010, " Merger-Motivated IPOs," *Financial management* 39, 1547–1573.

Hsieh, J., E. Lyandres, and A. Zhdanov, 2011, "A Theory of Merger-Driven IPOs," *Journal of Financial and Quantitative Analysis* 46, 1367–1405.

Jensen, M. And W. Meckling, 1976, "Theory of the Firm, Managerial Behavior, Agency Costs, and Ownership Structure," *Journal of Financial Economics* 3, 305-360.

Jensen, M., 1986, "Agency costs of free cash flow, corporate finance, and takeovers.," *American Economic Review* 76, 323-329.

Krishnan, C.N.V., Masulis, R.W, and A.K. Singh, 2007, "Does venture capital reputation matter? Evidence from subsequent IPO performance," *SSRN* working paper.

Matvos, G. And M. Ostrovsky, 2008, "Cross-ownership, returns, and voting in mergers," *Journal of Financial Economics* 89, 391–403.

Megginson, W. and K. Weiss, 1991, "Venture capitalist certification in initial public offerings," *Journal of Finance* 46, 879-903.

Mitchell, M. and J.H. Mulherin, 1996, "The impact of industry shocks on takeover and restructuring activity," *Journal of Financial Economics* 41, 193–229.

Mikkelson, W.H., M.M. Partch, and K. Shah, 1997, "Ownership and operating performance of companies that go public," *Journal of Financial Economics* 44, 281 – 307.

Purnanandam, A. and B. Swaminathan, 2004, "Are IPOs really underpriced?" *Review of Financial Studies* 17, 811–848.

Ragozzino, R. And J.J. Reuer, 2007, "Initial Public Offerings and the Acquisition of Newly-Public Firms," SSRN working paper.

Rau, P.R., Stouraitis, A., 2011, "Patterns in the timing of corporate event waves", *Journal of Financial and Quantitative Analysis* 46, 209–246

Roosenboom, P. and T. Goot, 2005, "The effect of ownership and control on market valuation: Evidence from initial public offerings in The Netherlands," *International Review of Financial Analysis* 14, 43– 59.

Rosen, R.J., S.B. Smart and C.J. Zutter, 2005, "Why do firms go public? Evidence from the Banking Industry," SSRN working paper.

Schultz, P.H. and M. Zaman, 2001, "Do the Individuals Closest to Internet Firms Believe They Are Overvalued?" *Journal of Financial Economics* 59, 347-381.

Shleifer, A. and R. Vishny, 2003, "Stock Market Driven Acquisitions," *Journal of Financial Economics* 70, 295–311.

Subrahmanyam, A. and S. Titman, 1999, "The Going Public Decision and the Development of Financial Markets," *Journal of Finance* 54, 1045–1082.

Wiggenhorn, J., K.C. Gleason,and J. Madura, 2007, "Going public to pursue acquisitions," *The Quarterly Review of Economics and Finance* 47, 331-351.

Figure 1

Aggregate IPO activity, aggregate acquisition activity and acquisition activity by IPOs

This figure presents aggregate IPO, aggregate acquisition activity and acquisitions by IPO firms. Annual aggregate IPO activity is scaled by the total number of IPOs during the sample period. Annual aggregate acquisition activity is scaled by the total number of acquisitions during the sample period. Annual acquisition values by IPO firm are scaled by the total number of acquisitions conducted by IPOs.

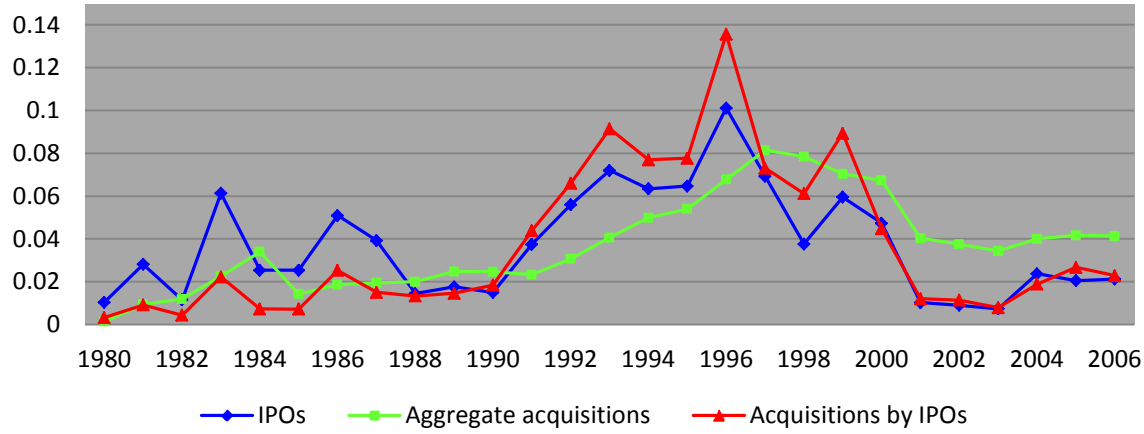

Figure 2

Acquisition deal values and IPO proceeds by year

This figure represents acquisition deal values and IPO proceeds scaled by the sum of acquisition values and the sum of IPO proceeds during the sample period respectively.

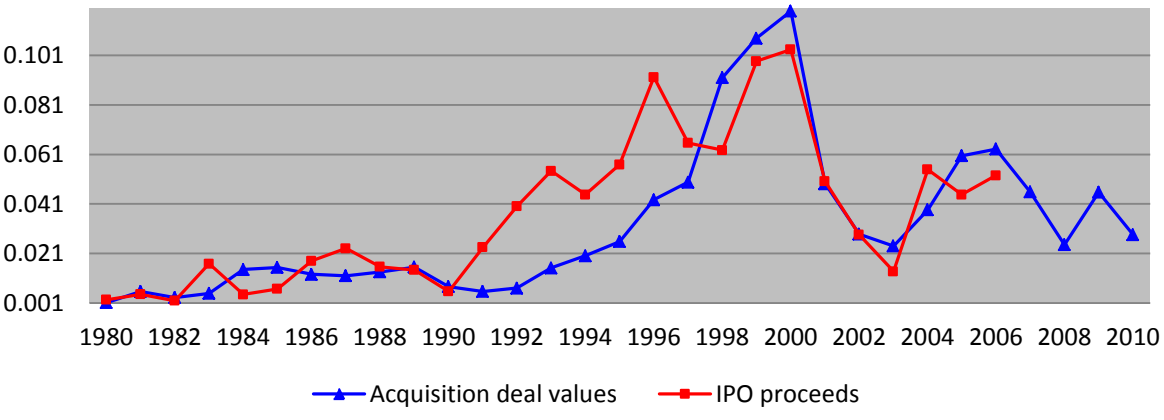

Figure 3
Number of acquisitions, number of IPOs and number of IPOs making acquisitions by industry

This figure illustrates the total number of acquisitions by IPOs, the total number of IPOs and the aggregate acquisition activity classified by industry. Acquisitions by IPOs in each industry are scaled by the total number of acquisitions made by IPOs in all studied industries. Total number of IPOs by industry is scaled by the sum of IPOs in all industries. Aggregate acquisitions by industry are scaled by all acquisitions in all studied industries.

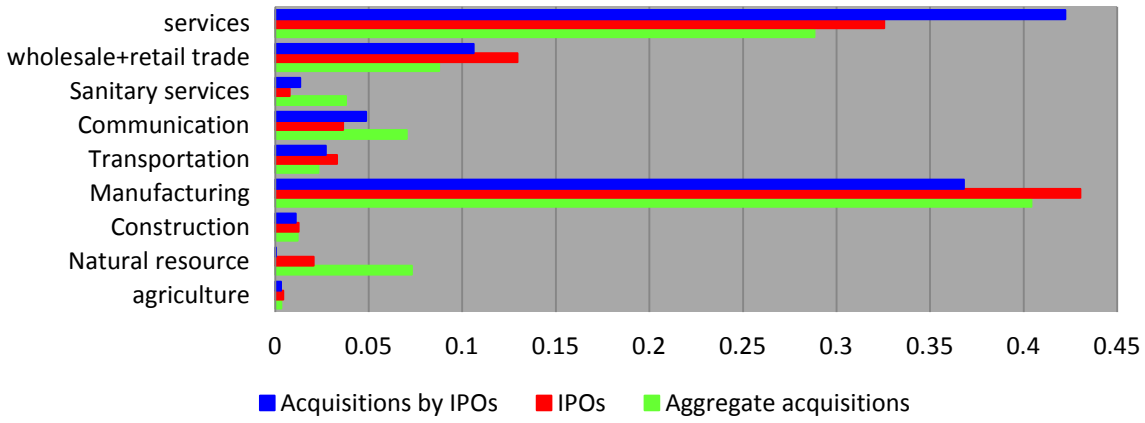

Table 1
Variables descriptions and their expected signs

Variable name	Description	Expected sign
Key variables		
Acquisition currency hypothesis		
Underpricing	The difference between the first day closing price and the offer price given as a percentage of the offer price	(+)
NUMA	The number of analysts following the acquirer	(+)
STDFOR	The standard deviation of analyst forecasts	(-)
Ownership structure hypothesis		
CHINS	Insider ownership changes defined as the difference between post-IPO and pre-IPO inside ownership	(-)
NUMOD	The number of outside directors	(-)/(+)
NUMCRH	The number of cross-holdings	(+)
BIEQOW	The total of institutional ownership in the bidder's equity	(+)
TAREQOW	The total institutional ownership in the target's equity	(+)
LARBCR	Dummy variable: 1 if there is a large cross-owner in the bidder's equity and zero otherwise.	(+)
LARTCR	Dummy variable: 1 if there is a large cross-owner in the target's equity and zero otherwise.	(+)
Venture backing hypothesis		
VC backed	Dummy variable: 1 if the IPO is backed by a venture capital firm and zero otherwise.	(+)
LOCKUP	The natural logarithm of the number of days between the IPO date and expiration date.	(-)/(+)
Control variables		
Proceeds	The natural logarithm of total proceeds	(-)/(+)
Price revision	The absolute value of the difference between the offer price and the midpoint of the initial filing range normalized by the midpoint of the initial filing range	(+)
MB	Market to book ratio	(+)
Prestige	Dummy variable: 1 if the underwriter is top tier. and 0 otherwise	(+)
Industry	Dummy variable: 1 if the target is in the same 3 digit SIC code as the acquirer and zero otherwise.	(+)
Private	Dummy variable: 1 if the target is private and zero otherwise.	(-)/(+)
Merger wave	The number of acquisitions in the industry defined by the two digit SIC and scaled by the total number of industry acquisitions during the sample period.	(+)

Table 2
Descriptive statistics of IPO sample

IPO year	Number of IPOs	% of IPOs making acquisitions	Average % of IPO Underpricing	Avarage IPO proceeds($mil)	Sum of IPO proceeds($mil)
1980	75	18.67	NA	16.21	1 215.93
1981	203	21.67	NA	11.72	2 378.95
1982	83	24.10	NA	12.27	1 018.39
1983	442	22.62	NA	20.12	8 893.69
1984	183	19.67	NA	12.72	2 327.84
1985	183	19.13	3.70	19.20	3 513.99
1986	367	28.61	12.42	25.88	9 497.04
1987	283	24.03	5.07	43.06	12 186.81
1988	104	39.42	5.48	79.26	8 242.91
1989	127	36.22	8.99	59.55	7 563.46
1990	108	61.11	11.48	27.65	2 986.64
1991	270	49.26	20.46	46.01	12 422.79
1992	403	48.88	10.88	52.53	21 171.03
1993	519	48.94	14.68	55.34	28 720.81
1994	457	45.30	10.05	51.76	23 653.36
1995	466	49.36	21.93	64.57	30 088.9
1996	729	48.29	18.92	66.86	48 741.84
1997	499	45.89	12.12	69.54	34 699.62
1998	271	53.51	27.18	122.37	33 161.68
1999	429	61.07	72.70	121.59	52 165.32
2000	341	48.97	57.25	160.26	54 649.84
2001	74	56.76	18.33	358.15	26 503.51
2002	65	50.77	12.06	231.97	15 078.14
2003	53	43.40	13.29	136.89	7 255.45
2004	171	38.60	10.52	169.84	29 043.79
2005	148	46.62	10.89	159.94	23 670.82
2006	153	41.83	11.83	181.38	27 752.32
1980-2006	7206	42.30	20.89	73.35	528 604.98

Table 3
Descriptive statistics of M&A sample

Acquisition year	Number of acquisitions by public firms	% of acquisitions by public firms	Average deal transaction ($mil)	Sum of deal transaction ($mil)
1980	40	0.13	222.51	8 900.57
1981	269	0.85	163.60	44 007.80
1982	339	1.07	74.09	25 116.31
1983	644	2.03	59.13	38 080.01
1984	966	3.04	117.59	113 589.98
1985	405	1.28	296.64	120 139.50
1986	530	1.67	185.42	98 274.54
1987	553	1.74	169.58	93 775.07
1988	569	1.79	186.72	10 6243.35
1989	704	2.22	172.35	12 1335.94
1990	701	2.21	85.17	59 701.86
1991	662	2.09	67.17	44 467.68
1992	873	2.75	62.85	54 866.60
1993	1156	3.64	102.91	118 964.97
1994	1419	4.47	110.96	157 448.51
1995	1536	4.84	131.90	202 604.48
1996	1928	6.08	173.61	334 711.99
1997	2316	7.30	168.61	390 498.76
1998	2232	7.04	323.30	721 614.07
1999	2003	6.31	422.69	846 642.23
2000	1914	6.03	487.12	932 352.21
2001	1147	3.62	336.11	385 519.13
2002	1067	3.36	211.46	225 625.10
2003	978	3.08	192.29	188 056.95
2004	1138	3.59	265.70	302 637.60
2005	1185	3.74	400.28	474 334.09
2006	1177	3.71	420.97	495 479.96
2007	1176	3.71	305.68	359 480.51
2008	831	2.62	231.45	192 334.25
2009	628	1.98	570.64	358 363.62
2010	640	2.02	350.29	224 184.23
1980-2010	31726	100	228.03	783 9351.85

Table 4

Acquisition activity of IPO firms over time

	Year 0	Year 1	Year 2	Year 3	Year 4
Total number of IPO firms making acquisitions	2547	2547	2547	2547	2547
Number of IPOs making at least one acquisition	525	1201	918	736	660
Percentage of IPO firms making at least one acquisition	20.61	47.15	36.04	28.89	25.91
Number of IPOs making frequent acquisitions	130	363	255	178	165
Percentage of IPOs making frequent acquisitions	24.76	30.22	27.77	24.18	25
Total number of acquisitions by IPO firms	708	1827	1356	1022	940
Percentage of acquisitions	12.09	31.21	23.16	17.46	16.06

Table 5
Summary statistics and Univariate tests

This table resumes summary statistics and Univariate tests. Panel A reports the results for IPOs not making any acquisition within the five years following the IPO and IPOs making at least one acquisition within the same time period respectively. Panel B reports results for cash financed and stock financed acquisitions respectively. *Underpricing* is the price run-up in the first trading day after the IPO defined as the difference between the first day closing price and the offer price given as a percentage of the offer price. *Proceeds* is the natural log of the total capital raised at the time of the IPO. *MB* is the market to book ratio of the acquirer measured at the IPO date. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is in the top tier and 0 otherwise. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. CHINS is the difference between post -IPO and pre-IPO inside ownership. *NUMOD* is the natural logarithm of the number of outside directors post-IPO. *NUMCRH* is the natural logarithm of the number of cross-holdings. *BIEQOW* is the total number of shares held by bidder cross-owners. *TAREQOW* is the total number of shares held by target cross-owners. Holdings are in percentages of all shares outstanding. as of the end of the last quarter prior to the announcement date. *LARBCR* is a dummy taking the value of one if there is a large bidder cross-owners and zero otherwise. *LARTCR* is a dummy taking the value of one if there is a large target cross-owners and zero otherwise. *VC backed* is a dummy taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *Private* is a dummy that takes the value of 1 if the target is privately held firm and zero otherwise. *Industry* is a dummy variable that takes the value of 1 if the acquirer and the target are in the same industry and 0 otherwise. *Merger wave* is the number of mergers in the acquirer's industry during the acquisition year scaled by the total number of industry mergers during our sample period. *NUMA* is the number of analysts following the acquirer. *SDTFOR* is the standard deviation of analyst earnings forecasts about the acquirer. The results of t-tests for the difference in means and non-parametric Wilcoxon rank-sum tests for the difference in medians are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels respectively.

Panel A : Summary statistics and Univariate tests for IPOs not making acquisitions and IPOs making acquisitions

	Total	IPOs not making acquisitions				IPOs making acquisitions				Difference	Difference
		N	Mean	Median	STD	N	Mean	Median	STD	in means	in medians
Underpricing	3331	1492	0.18	0.07	0.50	1839	0.32	0.15	0.60	-0.13	-0.08
										(-7.02)***	(-10.96)***
Proceeds	3331	1492	3.43	3.40	1.11	1839	3.89	3.78	0.96	-0.46	-0.38
										(-12.86)***	(-13.16)***
MB	2982	1492	1.58	1.07	1.83	1490	5.73	2.06	19.04	-4.14	-0.99
										(-8.36)***	(-20.10)***
Prestige	3331	1492	0.60	1	0.48	1839	0.73	1	0.44	-0.13	0.00
										(-8.36)***	(-8.28)***
Price revision	3331	1492	0.17	0.12	0.15	1839	0.19	0.14	0.19	-0.02	-0.02
										(-3.97)***	(-3.29)***
CHINS	1754	908	-0.17	-0.16	0.13	846	-0.22	-0.17	0.36	0.05	-0.01
										(3.95)***	(4.23)***
NUMOD	167	90	6.5	6	1.46	77	5.9	6	1.49	0.60	0.00
										(2.57)***	(2.45)***
NUMCRH	164	48	11.79	8	13.43	116	20.18	12	22.12	-8.33	-4
										(2.44)***	(-2.66)***
BIEQOW	164	48	0.08	0.03	0.13	116	0.13	0.08	0.14	-0.05	-0.05
										(-2.22)***	(-3.52)***
TAEQOW	164	48	0.08	0.04	0.11	116	0.17	0.12	0.16	-0.08	-0.08
										(-3.38)***	(-3.92)***
LARBCR	164	48	0.18	0.00	0.39	116	0.27	0.00	0.43	-0.08	0.00
										(-1.18)	(-1.18)
LARTCR	164	48	0.14	0.00	0.35	116	0.39	0.00	0.49	-0.25	0.00
										(-3.20)***	(-3.11)***
VC backed	2698	1492	0.40	0.00	0.49	1206	0.48	0.00	0.50	-0.07	0.00
										(-4.14)***	(-4.13)***

Panel B: Summary statistics and Univariate tests for cash financed and stock financed acquisitions

	Total	Cash financed acquisitions				Stock financed acquisitions				Difference	Difference
		N	Mean	Median	STD	N	Mean	Median	STD	in means	in medians
Underpricing	1820	1180	0.25	0.125	0.53	640	0.45	0.22	0.69	-0.20	-0.095
										(-7.10)***	(-8.89)***
Proceeds	1820	1180	3.97	3.96	0.98	640	3.77	3.63	0.88	0.19	0.33
										(4.22)***	(4.67)***
MB	1480	971	5.09	2.01	20.07	509	6.97	2.32	17.06	-1.88	-0.31
										(-1.80)*	(-1.72)
Prestige	1820	1180	0.69	1	0.45	640	0.80	1	0.39	-0.11	0.00
										(-5.13)***	(-5.10)***
Private	1820	1180	0.56	1	0.49	640	0.70	1	0.45	-0.14	0.00
										(-6.09)***	(-6.03)***
Industry	1820	1180	0.62	1	0.48	640	0.60	1	0.49	0.02	0
										(0.92)	(0.92)
Prive revision	1820	1180	0.17	0.12	0.17	640	0.23	0.18	0.23	-0.06	-0.06
										(-6.57)***	(-7.38)***
Merger wave	1820	1180	0.06	0.05	0.03	640	0.06	0.06	0.02	-0.01	-0.01
										(-5.36)***	(-6.90)***
NUMA	1755	1144	5.40	4	5.06	611	6.60	4	6.58	-1.20	0.00
										(-4.25)***	(-3.64)***
STDFOR	1395	926	0.04	0.01	0.15	469	0.06	0.01	0.27	-0.02	0
										(2.02)**	(-0.32)

Table 6
Regressions of acquisition activity by initial public offerings

We consider the following regression:

$$Y_i = \beta_0 + \beta_1\, Underpricing + \beta_2\, Proceeds + \beta_3\, Price\ revision + \beta_4\, MB + \beta_5\, Prestige + \varepsilon_i$$

The dependant variable in Panel A takes the value of 1 if an IPO firm makes at least one acquisition in the 5 years following the IPO and 0 otherwise. The dependant variable in Panel B takes the value of 0 if there is no acquisition in the five years following the IPO, 1 if the IPO firm makes at least one acquisition in the IPO year (year 0), 2 if the IPO firm makes at least one acquisition one year after the IPO, 3 if the IPO firm makes at least one acquisition 2 years after the IPO, 4 if the IPO firm makes at least one acquisition 3 years after the IPO and 5 if the IPO firm makes at least one acquisition 4 years after the IPO . *Underpricing* is the price run-up in the first trading day after the IPO defined as the difference between the first day closing price and the offer price given as a percentage of the offer price. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *Proceeds* is a measure of the size of the IPO firm defined as the natural log of the total capital raised at the time of the IPO. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *MB* is the market to book ratio of the acquirer measured at the IPO date. The regressions also include a constant term and industry dummies. For each independent variable, the first row reports its estimated coefficient; the second row the corresponding robust t-statistic. ***, **, and * indicate statistical significance at the 1%, 5% and 10% level respectively.

Panel A: Logit estimates

	(1)	(2)
Intercept	-0.764	-0.803
	(4.89)***	(4.99)***
Underpricing	0.244	
	(2.05)**	
Proceeds	0.238	0.130
	(5.13)***	(1.50)
MB	0.017	0.023
	(1.88)*	(2.08)**
Prestige	0.036	0.019
	(0.37)	(0.20)
Price revision		0.356
		(1.51)
Industry	yes	yes
Observations	2698	2698
Pseudo R^2	0.05	0.05

Panel B: Multinomial Logit estimates

	Year 0	Year 1	Year 2	Year 3	Year 4
Underpricing	0.376	0.449	0.166	0.060	0.111
	(2.15)**	(3.16)***	(1.08)	(0.38)	(0.70)
Proceeds	0.487	0.438	0.336	0.332	0.328
	(6.05)***	(7.58)***	(5.23)***	(4.50)***	(4.28)***
Price revision	0.057	-0.095	0.110	-0.220	-0.305
	(0.13)	(-0.29)	(0.30)	(-0.47)	(-0.68)
Prestige	-0.139	0.061	0.240	0.204	0.441
	(-0.72)	(0.47)	(1.71)*	(1.31)	(2.38)**
MB	0.012	-0.056	0.018	0.024	0.024
	(0.84)	(-1.42)	(2.05)**	(2.91)**	(2.84)**
Industry	yes	yes	yes	yes	yes
Observations	3169	3169	3169	3169	3169
Pseudo R^2	0.05	0.05	0.05	0.05	0.05

Table 7
Logit regressions regarding the choice of the method of payment

This table shows the results of the following regression model:

$$Y_{it} = \beta_0 + \beta_1 Underpricing + \beta_2\, Price\ revision + \beta_3\, Proceeds + \beta_4\, Industry + \beta_5\, Prestige + \beta_6\, Private + \beta_7\, Merger\ wave + \beta_8\, MB + \beta_9\, NUMA + \beta_{10} STDFOR + \beta_{11} Underpricing * NUMA + \beta_{12}\, Underpricing * STDFOR + \varepsilon_{it}$$

The dependent variable is equal to one for stock financed acquisitions and zero for cash financed acquisitions over the period from year 0 (the IPO year) to year 4 following the IPO, with t = 0, 1, 2, 3, 4 denoting the number of years after the IPO. *Underpricing* is the price run-up in the first trading day after the IPO defined as the difference between the first day closing price and the offer price given as a percentage of the offer price. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *Proceeds* is the natural log of the total capital raised at the time of the IPO, taken as a measure of the acquirer size. *Industry* is a dummy variable that takes the value of 1 if the acquirer and the target are in the same industry and 0 otherwise. *Private* takes on the value of 1 if the target is privately held firm and 0 otherwise. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *Merger wave* is the number of mergers in the acquirer's industry during the acquisition year scaled by the total number of industry mergers during our sample period. *MB* is the market to book ratio of the acquirer measured at the end of the pre-merger year. *NUMA* is the number of analysts following the acquirer. *STDFOR* is the standard deviation of analyst earnings forecasts about the acquirer. We estimate the model using Heckman procedure. The inverse Mills ratio is included in the table. Regressions include a constant term and year dummies. For each independent variable, the first row reports its estimated coefficient; the second row reports the corresponding robust t-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level respectively.

Panel A: Logit regressions where the dependant variable takes the value of one if the method of payment was stock and zero if it was cash

	Year 0					Year 1				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Intercept	6.359	5.940	11.829	5.014	8.996	13.554	12.809	9.268	11.139	7.667
	(1.59)	(1.46)	(2.20)**	(1.21)	(1.68)*	(2.91)***	(2.72)***	(1.67)*	(2.33)**	(1.38)
Underpricing	0.478	0.472	0.430			0.625	0.630	0.525		
	(2.19)**	(2.17)**	(1.97)**			(2.33)**	(2.38)**	(2.24)**		
Price revision				1.611	5.953				1.676	2.235
				(1.51)	(3.29)***				(1.54)	(1.90)*
Proceeds	-1.194	-1.122	-1.664	-1.066	-1.397	-2.027	-2.275	-1.707	-1.997	-1.610
	(2.93)***	(2.73)***	(2.98)***	(2.51)**	(2.61)***	(4.15)***	(4.66)***	(3.07)***	(4.05)***	(2.87)***
Industry	0.240	0.391	0.402	0.341	0.420	0.707	0.672	1.073	0.790	1.182
	(0.60)	(0.91)	(0.72)	(0.81)	(0.71)	(1.69)*	(1.56)	(2.12)**	(1.87)*	(2.40)**
Private	0.996	0.960	0.533	1.095	0.542	0.752	0.824	0.695	0.739	0.718
	(2.43)**	(2.32)**	(1.09)	(2.47)**	(0.94)	(2.66)***	(2.89)***	(2.26)**	(2.66)***	(2.32)**
Prestige	0.660	0.595	0.640	0.630	0.503	-0.141	-0.197	-0.190	-0.123	-0.145
	(1.79)*	(1.58)	(1.36)	(1.63)	(1.03)	(0.56)	(0.79)	(0.67)	(0.49)	(0.51)
Merger wave	16.673	15.213	28.136	12.667	18.820	11.175	12.763	9.976	11.415	10.334
	(2.71)***	(2.45)**	(3.71)***	(2.39)**	(2.43)**	(3.01)***	(3.41)***	(2.61)***	(3.07)***	(2.73)***
NUMA		0.005					0.204			
		(0.04)					(4.63)***			
STDFOR			-2.279					0.354		
			(2.30)**					(1.92)*		
*NUMA*Underpricing*				0.057					0.137	
				(0.70)					(2.65)***	
*STDFOR*Underpricing*					-6.219					0.306
					(2.72)***					(1.97)**
MB						-0.439				
						(1.41)				
Invmills	-3.127	-3.013	-5.659	-2.643	-4.644	-5.959	-5.721	-4.253	-4.968	-3.609
	(1.95)*	(1.83)*	(2.56)**	(1.63)	(2.14)**	(2.82)***	(2.69)***	(1.68)*	(2.32)**	(1.44)
Observations	193	184	133	184	133	411	411	319	411	319
Pseudo R^2	0.14	0.14	0.20	0.14	0.26	0.19	0.21	0.18	0.21	0.19

Panel B: Logit regressions where the dependant variable takes the value of one if the method of payment was stock and zero if it was cash .

	Year 2					Year 3				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Intercept	2.328	2.591	3.702	2.093	3.076	3.482	0.921	3.991	1.877	4.109
	(1.04)	(1.41)	(1.65)*	(1.11)	(1.35)	(1.38)	(0.44)	(1.65)*	(0.90)	(1.72)*
Underpricing	0.357	0.261	0.185			0.659	0.643	0.499		
	(1.61)	(1.46)	(1.05)			(2.04)**	(2.17)**	(1.47)		
Price revision				0.367	1.422				-0.105	-0.129
				(0.66)	(2.10)**				(0.14)	(0.15)
Proceeds	-0.461	-0.553	-0.734	-0.481	-0.723	-0.466	-0.600	-0.451	-0.413	-0.447
	(2.48)**	(3.38)***	(3.63)***	(2.97)***	(3.44)***	(2.16)**	(3.38)***	(2.15)**	(2.12)**	(2.19)**
Industry	0.508	0.560	0.336	0.585	0.241	0.229	0.425	0.246	0.353	0.304
	(1.30)	(1.92)*	(0.97)	(2.02)**	(0.69)	(0.57)	(1.34)	(0.62)	(1.12)	(0.78)
Private	0.171	0.220	0.241	0.221	0.241	0.614	0.527	0.681	0.524	0.657
	(0.68)	(1.06)	(0.98)	(1.07)	(0.97)	(2.20)**	(2.12)**	(2.46)**	(2.15)**	(2.39)**
Prestige	-0.213	-0.210	-0.216	-0.224	-0.234	-0.142	0.026	-0.249	-0.103	-0.254
	(0.88)	(1.01)	(0.86)	(1.08)	(0.95)	(0.52)	(0.11)	(0.94)	(0.44)	(0.97)
Merger wave	7.773	5.088	7.697	4.982	8.099	13.214	7.224	5.035	7.713	5.261
	(1.88)*	(1.62)	(2.00)**	(1.58)	(2.06)**	(2.78)***	(1.75)*	(1.07)	(1.91)*	(1.13)
NUMA		0.032					0.092			
		(1.65)*					(3.82)***			
SDTFOR			0.017					0.212		
			(0.15)					(1.15)		
*NUMA*Underpricing*				0.040					0.105	
				(1.57)					(3.22)***	
*SDTFOR*Underpricin g*					1.902					0.387
					(1.75)*					(2.00)**
MB	0.044					-0.001				
	(2.81)***					(0.36)				
Invmills	-2.089	-1.729	-1.915	-1.451	-1.585	-2.891	-1.017	-3.014	-1.694	-3.030
	(1.67)*	(1.68)*	(1.54)	(1.39)	(1.27)	(2.22)**	(0.91)	(2.38)**	(1.56)	(2.40)**
Observations	364	481	342	481	342	289	379	294	379	294
Pseudo R^2	0.11	0.05	0.06	0.05	0.08	0.08	0.10	0.06	0.07	0.05

Panel C: : Logit regressions where the dependant variable takes the value of one if the method of payment was stock and zero if it was cash .

	Year 4					Year 0-4				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Intercept	2.943	1.060	1.074	0.763	0.663	0.884	0.383	0.968	0.503	0.582
	(2.18)**	(0.98)	(0.85)	(0.64)	(0.50)	(1.86)*	(0.78)	(1.88)*	(1.02)	(1.03)
Underpricing	0.469	0.441	1.138			0.581	0.568	0.588		
	(0.98)	(0.95)	(1.79)*			(3.72)***	(3.63)***	(3.84)***		
Price revision				2.200	2.436				1.118	1.632
				(1.99)**	(1.74)*				(2.95)***	(3.71)***
Proceeds	-0.538	-0.597	-0.510	-0.487	-0.475	-0.572	-0.636	-0.540	-0.562	-0.552
	(3.03)***	(3.48)***	(2.20)**	(2.41)**	(2.08)**	(6.26)***	(7.71)***	(5.49)***	(6.04)***	(5.04)***
Industry	0.599	0.942	0.818	0.737	0.661	0.652	0.743	0.634	0.671	0.627
	(1.33)	(2.18)**	(1.70)*	(1.73)*	(1.32)	(3.89)***	(4.28)***	(3.37)***	(3.99)***	(3.25)***
Private	0.363	0.449	0.263	0.413	0.240	0.586	0.570	0.533	0.563	0.540
	(1.14)	(1.40)	(0.72)	(1.29)	(0.64)	(4.61)***	(4.35)***	(3.73)***	(4.28)***	(3.54)***
Prestige	0.125	0.121	0.089	0.150	0.171	-0.051	-0.045	-0.106	-0.058	-0.060
	(0.39)	(0.37)	(0.24)	(0.46)	(0.45)	(0.42)	(0.37)	(0.78)	(0.47)	(0.43)
Merger wave	2.173	-2.010	0.320	2.413	2.038	8.896	8.304	8.164	8.653	8.811
	(0.36)	(0.34)	(0.05)	(0.39)	(0.30)	(4.53)***	(4.21)***	(3.86)***	(4.48)***	(4.03)***
NUMA		0.040					0.055			
		(1.66)*					(3.84)***			
STDFOR			2.509					0.030		
			(0.92)					(1.06)		
*NUMA*Underpricing*				0.007					0.067	
				(0.33)					(3.62)***	
*STDFOR*Underpricing*					23.384					0.128
					(1.29)					(1.25)
MB	-0.051									
	(2.25)**									
Invmills	-1.770	-0.763	-0.846	-0.885	-0.838	-1.558	-1.217	-1.657	-1.380	-1.291
	(3.45)***	(2.66)***	(2.74)***	(3.11)***	(2.66)***	(6.44)***	(4.57)***	(6.28)***	(5.42)***	(4.59)***
Year dummies						yes	yes	yes	yes	yes
Observations	228	227	170	228	170	1827	1762	1461	1768	1312
Pseudo R^2	0.13	0.12	0.10	0.12	0.11	0.07	0.09	0.07	0.08	0.07

Table 8
Insider ownership and post-IPO acquisition activity

This table presents the results of the following regression model:

$$Y_i=\beta_0+\beta_1\text{Proceeds}+\beta_2\text{MB}+\beta_3\text{Prestige}+\beta_4\text{Price revision}+\beta_5\text{CHINS}+\beta_6\text{INSIDERS LESS 50\%}+\varepsilon_i$$

In Panel A, the dependant variable takes the value of 1 if an IPO firm makes at least one acquisition in the 5 years following the IPO date and 0 otherwise. In panel B, the dependant variable takes the value of 0 if there is no acquisition in the five years following the IPO, 1 if the IPO firm makes at least one acquisition in the IPO year (year 0), 2 if the IPO firm makes at least one acquisition one year after the IPO, 3 if the IPO firm makes at least one acquisition 2 years after the IPO date, 4 if if the IPO firm makes at least one acquisition 3 years after the IPO date and 5 if the IPO firm makes at least one acquisition 4 years after the IPO date. *Proceeds* is the natural log of the total capital raised at the time of the IPO. *MB* is the market to book ratio of the acquirer measured at the IPO date. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *CHINS* is the difference between post -IPO and pre-IPO inside ownership. *Insiders less 50%* is a dummy taking the value one if the firm insiders hold less than 50% of the company post -IPO, and zero otherwise. The regressions also include a constant term. For each independent variable, the first row reports its estimated coefficient; the second row the corresponding robust t-statistic. ***, ** and * indicate statistical significance at the 1%, 5%, and 10% level respectively.

Panel A: Logit regression results

	(1)	(2)
Intercept	-1.683	-0.943
	(-6.802)***	(-4.140)***
Proceeds	-0.0200	-0.0257
	(-0.278)	(-0.368)
MB	0.0110	0.00799
	(1.892)*	(1.702)*
Prestige	0.0984	-0.00514
	(0.808)	(-0.0430)
Price revision	0.0798	-0.0325
	(0.263)	(-0.109)
CHINS	-2.171	
	(-5.921)***	
INSIDERS LESS 50%		-0.175
		(-1.711)*
Industry	yes	yes
Observations	1.658	1.658
Pseudo R^2	0.0504	0.0331

Panel B: Multinomial logit regressions

	Year 0	Year 1	Year 2	Year 3	Year 4
Intercept	-3.686	-3.374	-2.762	-2.767	-3.098
	(-8.224)***	(-9.534)***	(-7.793)***	(-7.255)***	(-7.235)***
Proceeds	0.088	0.104	-0.047	-0.128	-0.124
	(0.724)	(1.098)	(-0.510)	(-1.241)	(-1.147)
MB	-0.007	0.002	0.016	0.0148	0.0156
	(-0.359)	(0.321)	(2.836)	(2.374)**	(2.567)**
Prestige	0.047	0.033	0.109***	0.202	0.366
	(0.192)	(0.166)	(0.618)	(1.061)	(1.560)
Price revision	0.029	0.047	-0.867	-0.898	-1.305
	(0.0567)	(0.121)	(-1.933)*	(-1.755)*	(-2.645)***
CHINS	-2.301	-2.154	-2.418	-1.262	-1.466
	(-3.886)***	(-4.433)***	(-4.496)***	(-2.471)**	(-2.082)**
Industry	yes	yes	yes	yes	yes
N = 1882					
Pseudo R^2= 0.10					

Table 9
Outside directors and post-IPO acquisition activity

This table shows the results of the following model:

$$Y_i = \beta_0 + \beta_1 Proceeds + \beta_2 Prestige + \beta_3 Price\ revision + \beta_4 MB + \beta_5 NUMOD + \beta_6 INSIDERS\ LESS\ 50\% + \beta_7 CHINS + \varepsilon_i$$

The dependant variable takes the value of 1 if an IPO firm makes at least one acquisition in the 5 years following the IPO date and 0 otherwise. *Proceeds* is the natural log of the total capital raised at the time of the IPO. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *MB* is the market to book ratio of the acquirer measured at the IPO date. *NUMOD* is the log of the number of outside directors post -IPOs. *INSIDER LESS 50%* is a dummy taking the value one if the firm insiders hold less than 50% of the company and zero otherwise. *CHINS* is the difference between post -IPO and pre-IPO inside ownership. The regressions also include a constant term. For each independent variable, the first row reports its estimated coefficient; the second row the corresponding robust t-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level respectively.

	Logit estimates	
	(2)	(3)
Intercept	1.857	2.500
	(1.087)	(1.491)
Proceeds	0.259	0.235
	(1.191)	(1.037)
Prestige	0.279	0.263
	(0.701)	(0.642)
Price revision	-2.059	-2.399
	(-1.193)	(-1.311)
MB	0.0214	0.0208
	(1.233)	(1.253)
NUMOD	-1.883	-1.917
	(-2.775)***	(-2.825)***
INSIDERS LESS 50%		-0.306
		(-0.918)
CHINS	-1.324	
	(-1.012)	
Observations	167	167
Pseudo R^2	0.08	0.07

Table 10
Cross-holdings and method of payment in post-IPO acquisitions

The table below shows the results of the following regression:

$$Y_i = \beta_0 + \beta_1 Proceeds + \beta_2\, Prestige + \beta_3\, Price\ revision + \beta_4\, Industry + \beta_5 Merger\ wave + \beta_6\, NUMCRH + \beta_7\, BIEQOW + \beta_8\, TAREQOW + \beta_9\, LARBCR + \beta_{10}\, LARTCR + \varepsilon_i$$

The dependent variable is equal to one for stock financed acquisitions and zero for cash financed acquisitions over the five years following the IPO. *Proceeds* is the natural log of the total capital raised at the time of the IPO, taken as a measure of the acquirer size. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *Industry* is a dummy variable that takes the value of 1 if the acquirer and the target are in the same industry and 0 otherwise. *Merger wave* is the number of mergers in the acquirer's industry during the acquisition year scaled by the total number of industry mergers during our sample period. *NUMCRH* is the log of the number of cross-holdings. *BIEQOW* is the total number of shares held by bidder cross-owners. *TAREQOW* is the total number of shares held by target cross-owners. Holdings are in percentages of all shares outstanding as of the end of the last quarter prior to the merger. *LARBCR* is a dummy taking the value of one if there is a blockholder (Owns more than 5% in the acquirer) in the bidder cross-owners, and zero otherwise. *LARTCR* is a dummy taking the value of one if there is a blockholder (more than 5%) in the target cross-owners, and zero otherwise. The regressions also include a constant term and invmills ratio from the Heckman estimation. For each independent variable, the first row reports its estimated coefficient; the second row the corresponding robust *t*-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level respectively.

	Logit estimates				
	(1)	(2)	(3)	(4)	(5)
Intercept	13.80	15.94	15.96	15.51	14.74
	(2.579)***	(3.005)***	(3.156)***	(2.847)***	(2.813)***
Proceeds	-2.000	-2.014	-2.052	-1.893	-1.835
	(-4.204)***	(-4.099)***	(-4.440)***	(-4.048)***	(-4.086)***
Prestige	-1.084	-1.255	-1.242	-1.273	-1.156
	(-1.273)	(-1.501)	(-1.495)	(-1.462)	(-1.364)
Price revision	-0.737	-0.913	-0.814	-0.937	-0.801
	(-0.694)	(-0.859)	(-0.774)	(-0.856)	(-0.743)
Industry	0.0286	0.190	0.0615	0.259	0.189
	(0.0677)	(0.478)	(0.155)	(0.622)	(0.468)
Merger wave	0.275	1.527	-0.679	-0.131	-0.483
	(0.0385)	(0.219)	(-0.0961)	(-0.0198)	(-0.0707)
NUMCRH	0.607				
	(2.824)***				
BIEQOW		4.283			
		(1.191)			
TAREQOW			5.862		
			(2.300)**		
LARBCR				0.406	
				(0.795)	
LARTCR					1.135
					(2.119)**
Invmills	-3.620	-4.411	-4.361	-4.166	-3.967
	(-1.858)*	(-2.265)**	(-2.376)**	(-2.087)**	(-2.061)**
Observations	150	150	150	150	150
Pseudo R^2	0.20	0.18	0.21	0.15	0.18

Table 11
Venture capital backing and post-IPO acquisitions

This table shows the results of the following regression model:

$$Y_i = \beta_0 + \beta_1 VC\ backed + \beta_2 Proceeds + \beta_3 MB + \beta_4 Prestige + \beta_5 Price\ revision + \beta_6 LOCKUP + \beta_7\ VC\ backed * Prestige + \beta_8 VC\ backed * LOCKUP + \varepsilon_i$$

The dependant variable in Panel A takes the value of 1 if an IPO firm makes at least one acquisition in the 5 years following the IPO date and 0 otherwise. In Panel B, the dependant variable takes the value of 0 if there is no acquisition in the five years following the IPO, 1 if the IPO firm makes at least one acquisition in the IPO year (year 0), 2 if the IPO firm makes at least one acquisition one year after the IPO, 3 if the IPO firm makes at least one acquisition 2 years after the IPO date, 4 if the IPO firm makes at least one acquisition 3 years after the IPO date and 5 if the IPO firm makes at least one acquisition 4 years after the IPO date. *VC backed* is a dummy taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *Proceeds* is the natural log of the total capital raised at the time of the IPO. *MB* is the market to book ratio of the acquirer measured at the IPO date. Prestige is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *LOCKUP* is the natural logarithm of the number of days between the IPO date and expiration date (lockup). The regressions also include industry dummies and a constant term. For each independent variable, the first row reports its estimated coefficient; the second row reports the corresponding robust *t*-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% evel respectively.

Panel A : Logit regression results

	(1)	(2)	(3)	(4)
Intercept	-1.124	1.866	-1.005	-0.502
	(-6.041)***	(2.063)**	(-5.609)***	(-2.238)**
VC backed	0.301	0.0434		4.418
	(3.375)***	(0.442)		(2.746)***
Proceeds	0.0301	0.108	-0.00206	0.122
	(0.572)	(1.033)	(-0.0428)	(1.166)
MB	0.00267	0.0104	0.00277	0.0103
	(1.260)	(2.569)**	(1.312)	(2.604)***
Prestige	-0.124	0.0713		0.0741
	(-1.225)	(0.650)		(0.673)
Price revision	0.00287	-0.206	-0.0114	-0.204
	(0.0105)	(-0.723)	(-0.0418)	(-0.724)
LOCKUP		-0.434		
		(-2.774)***		
VC backed * Prestige			0.256	
			(2.831)***	
VC backed * LOCKUP				-0.837
				(-2.712)***
Industry	yes	yes	yes	yes
Observations	2.782	2.135	2.782	2.135
Pseudo R^2	0.15	0.06	0.15	0.06

Panel B: Multinomial logit regression results

	Year 0	Year 1	Year 2	Year 3	Year 4
VC backed	0.37	0.31	0.10	0.35	0.50
	(2.20)	(2.30)**	(0.85)	(2.51)**	(3.36)***
Proceeds	0.13	0.16	-0.03	-0.04	-0.03
	(1.53)	(2.44)**	(-0.50)	(-0.47)	(-0.40)
Price revision	0.48	0.40	-0.01	-0.49	-0.54
	(1.16)	(1.18)	(-0.03)	(-1.12)	(-1.26)
Prestige	-0.37	-0.12*	-0.02	-0.17	0.03
	(-1.84)	(-0.79)	(-0.20)	(-1.03)	(0.18)
MB	-0.02	-0.003	0.003	0.004	0.005
	(-1.15)	(-0.70)	(1.26)	(1.45)	(1.65)
Industry	yes	yes	yes	yes	Yes
N = 2824					
Pseudo R^2 = 0.09					

Table 12
Post-IPO acquisitions during the lockup period

This table shows the results of the following regression model:

$$Y_i = \beta_0 + \beta_1\, VC\ backed + \beta_2\, Price\ revision + \beta_3\, Proceeds + \beta_4\, MB + \beta_5\, Prestige + \beta_6 LOCKUP + \beta_7\, VC\ backed * LOCKUP + \beta_8\, VC\ backed * Prestige + \varepsilon_i$$

The dependant variable takes the value of 1 if an IPO firm makes an acquisition during the lockup period, and zero otherwise. *VC backed* is a dummy taking the value of one if the IPO is backed by a venture capital firm, and zero otherwise. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *Proceeds* is the natural log of the total capital raised at the time of the IPO. *MB* is the market to book ratio of the acquirer measured at the IPO date. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *LOCKUP* is the natural logarithm of the number of days between the IPO date and expiration date (lockup). The regressions also include industry dummies, constant term and invmills ratio from the Heckman estimation. For each independent variable, the first row reports its estimated coefficient and the second row reports the corresponding robust *t*-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level respectively.

	Logit estimates			
	(1)	(2)	(3)	(4)
Constant	4.038	-5.042	3.072	3.101
	(3.114)***	(-2.662)***	(2.305)**	(2.447)**
VC backed	-0.0446		-4.064	
	(-0.275)		(-1.830)*	
Price revision	-0.288	-0.0174	-0.0426	-0.123
	(-0.633)	(-0.0393)	(-0.0923)	(-0.269)
Proceeds	0.0347	-0.236	-0.345	-0.0235
	(0.302)	(-1.385)	(-2.018)**	(-0.202)
MB	-0.0276	-0.0231	-0.0233	-0.0295
	(-1.414)	(-1.485)	(-1.483)	(-1.347)
Prestige	-0.684	-0.523	-0.686	
	(-3.771)***	(-2.779)***	(-3.736)***	
LOCKUP		1.423		
		(5.476)***		
VC backed*LOCKUP			0.781	
			(1.837)*	
VC backed*Prestige				-0.354
				(-2.126)**
Invmills	-3.308	-2.601	-2.656	-2.357
	(-3.169)***	(-2.513)**	(-2.478)**	(-2.330)**
Industry	yes	yes	yes	yes
Observations	1.135	902	902	1.135
Pseudo R^2	0.140	0.0777	0.0497	0.132

Table 13
Post-IPO acquisitions during the lockup period in the IPO year

This table shows the results of the following regression model:

$$Y_i = \beta_0 + \beta_1 VC\ backed + \beta_2 Proceeds + \beta_3 MB + \beta_4 Prestige + \beta_5 Price\ revision + \beta_6 LOCKUP + \beta_7 VC\ backed * Prestige + \beta_8 VC\ backed * LOCKUP + \varepsilon_i$$

The dependant variable takes the value of 1 if an IPO firm makes an acquisition in the IPO year during the lockup period and zero otherwise. *VC backed* is a dummy taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *Proceeds* is the natural log of the total capital raised at the time of the IPO. *MB* is the market to book ratio of the acquirer measured at the IPO date. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *LOCKUP* is the natural logarithm of the number of days between the IPO date and expiration date (lockup). Regressions also include industry dummies and a constant term. For each independent variable, the first row reports its estimated coefficient; the second row the corresponding robust *t*-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level respectively.

	Logit estimates			
	(1)	(2)	(3)	(4)
Intercept	0.739	-10.99	1.056	0.660
	(0.840)	(-1.682)*	(1.267)	(0.734)
VC backed	0.569			
	(1.554)			
Proceeds	0.524	-0.330	0.439	-0.236
	(2.109)**	(-0.688)	(1.875)*	(-0.501)
MB	-0.107	-0.0418	-0.122	-0.0746
	(-1.427)	(-0.528)	(-1.580)	(-0.940)
Prestige	-0.494	-0.354		-0.645
	(-1.219)	(-0.923)		(-1.584)
Price revision	1.408	1.996	1.435	1.828
	(2.084)**	(2.181)**	(2.081)**	(1.957)*
LOCKUP		2.323		
		(1.905)**		
VC backed prestige*			0.301	
			(0.817)	
*VC backed*LOCKUP*				0.152
				(2.086)**
Observations	191	156	191	156
Pseudo R^2	0.24	0.06	0.23	0.05

Table 14
Survival analysis results

The following model is estimated for the likelihood of M&A event and its timing relative to the IPO:

$$Y_i = \beta_0 + \beta_1 Underpricing + \beta_2 VC\ backed + \beta_3 Price\ revision + \beta_4 Proceeds + \beta_5 MB + \beta_6 Prestige + \beta_7 CHINS + \beta_8 INSIDER\ LESS\ 50\% + \varepsilon_i$$

Underpricing is the price run-up in the first trading day after the IPO defined as the difference between the first day closing price and the offer price given as a percentage of the offer price. *VC backed* is a dummy taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *Proceeds* is the natural log of the total capital raised at the time of the IPO. *MB* is the market to book ratio of the acquirer measured at the IPO date. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *CHINS* is the difference between post -IPO and pre-IPO inside ownership. *INSIDER LESS 50%* is a dummy taking the value one if the firm insiders hold less than 50% of the company, and zero otherwise. For each independent variable, the first row reports its estimated coefficient; the second row the corresponding robust t-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level respectively.

	Cox regression estimates				
	(1)	(2)	(3)	(4)	(5)
Underpricing	0.210				0.222
	(3.164)***				(3.437)***
VC backed		0.188			0.154
		(3.639)***			(2.709)***
Price revision		0.330	0.274	0.175	
		(2.140)**	(1.632)	(1.037)	
Proceeds	0.246	0.336	0.283	0.257	0.282
	(7.271)***	(7.121)***	(8.280)***	(7.568)***	(8.121)***
MB	0.00144	0.000591	0.00227	0.00162	0.00196
	(3.489)***	(0.938)	(5.174)***	(3.948)***	(4.949)***
Prestige	0.0770	-0.0792	0.172	0.0897	0.118
	(1.200)	(-1.325)	(2.628)***	(1.387)	(1.745)*
CHINS			-1.497		-1.587
			(-9.979)***		(-10.48)***
INSIDER LESS 50%				-0.117	
				(-2.199)**	
Observations	2.298	3062	2.298	2.294	2.298
Wald_test	111.5	124.1	194.5	105.7	220.6
Log_likelihood	-10544	-12843	-10505	-10518	-10493

Table 15
Descriptive statistics and Univariate tests

This table presents summary statistics and Univariate tests for differences in means and medians for single and frequent IPO acquirers respectively. *Proceeds* is the natural log of the total capital raised at the time of the IPO. *Underpricing* is the price run-up in the first trading day after the IPO defined as the difference between the first day closing price and the offer price given as a percentage of the offer price. *VC backed* is a dummy taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *MB* is the market to book ratio of the acquirer measured at the IPO date. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *ADVISOR* is a dummy variable taking the value of one if the underwriter from IPO is the same as the acquisition advisor, and zero otherwise. The results of t-tests for the difference in means and non-parametric Wilcoxon rank-sum tests for the difference in medians are reported in parentheses. ***, **and * indicate significance at the 1%, 5% and 10% levels respectively.

	Single IPO acquirers					Frequent IPO acquirers				Difference in means	Difference in medians
	All	N	Mean	STD	Median	N	Mean	STD	Median		
Proceeds	901	406	3.68	0.96	3.68	495	3.83	0.97	3.80	-0.14 (-2.27)**	-0.12 (-2.39)**
Underpricing	901	406	0.28	0.51	0.14	495	0.35	0.69	0.15	-0.07 (-1.76)*	-0.01 (-1.64)*
VC backed	901	406	0.49	0.50		495	0.49	0.50		0.00 (0.12)	
Prestige	901	406	0.68	0.46		495	0.71	0.45		-0.03 (-1.00)	
MB	901	406	5.13	8.96	3.26	495	5.88	12.75	3.47	-0.75 (-1.00)	-0.21 (-0.93)
Price revision	901	406	0.18	0.19	0.13	495	0.20	0.20	0.15	-0.01 (-1.00)	-0.02 (-1.49)
ADVISOR	392	126	0.23	0.42		266	0.35	0.48		-0.12 (-2.53)**	

Table 16
IPO characteristics and the likelihood of frequent acquisitions by IPO firms

This table presents the results of the following regression model:

$$Y_i = \beta_0 + \beta_1 Underpricing_i + \beta_2 Proceeds_i + \beta_3 Prestige_i + \beta_4 VC\ backed_i + \beta_5 MB_i$$
$$+\beta_6 Price\ revision_i + \beta_7 ADVISOR_i + \beta_8 ADVISOR * prestige_i + \varepsilon_i$$

In model 1, 2 and 3, the dependant variable takes the value of 1 if an IPO firm makes at least two acquisitions in the five years following the IPO and zero otherwise. In model 4, the dependant variable takes the value of one if the IPO firm becomes acquirer in a given year in the five years following its IPO and zero otherwise. *Underpricing* is the price run-up in the first trading day after the IPO defined as the difference between the first day closing price and the offer price given as a percentage of the offer price. *Proceeds* is the natural log of the total capital raised at the time of the IPO. *Prestige* is a dummy variable that takes the value of 1 if the underwriter is top tier and 0 otherwise. *VC backed* is a dummy taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *MB* is the market to book ratio of the acquirer measured at the IPO date. *Price revision* is defined as the absolute value of the revision of the offer price relative to the midpoint of the initial filing range. *ADVISOR* is a dummy variable taking the value of one if the underwriter from IPO is the same as the acquisition advisor and zero otherwise. *PREAQC* is the natural logarithm of one plus the number of previous acquisitions by the IPO firm over the five years following the IPO date. For each independent variable, the first row reports its estimated coefficient and the second row reports the corresponding robust *t*-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level respectively.

	(1)	(2)	(3)	(4)
Intercept	-0.322	-0.164	-0.572	-1.024
	(0.53)	(0.27)	(-1.69)*	(7.64) ***
Underpricing	0.173	0.180	0.344	-0.029
	(0.87)	(0.93)	(2.47)**	(0.49)
Proceeds	0.284	0.279	0.113	0.078
	(1.99)**	(1.97)**	(1.34)	(1.85)*
Prestige	-0.355	-0.509		0.045
	(1.18)	(1.66)*		(0.48)
VC backed	-0.275	-0.289	0.075	0.020
	(1.13)	(1.19)	(0.41)	(0.25)
MB				0.006
				(2.18)**
Price revision	0.911	0.856	-0.405	
	(1.46)	(1.37)	(-0.88)	
ADVISOR	0.515			
	(2.02)**			
*ADVISOR*Prestige*		0.644		
		(2.28)**		
PREACQ				0.386
				(6.30)***
Observations	392	392	535	3230
Pseudo R^2	0.04	0.04	0.01	
Log likelihood				-2064.63