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UNIVERSITÉ DU QUÉBEC À MONTRÉAL

TROIS ESSAIS SUR LES INTRODUCTIONS EN BOURSE : MOTIVATION ET PERFORMANCE A LONG TERME.

THÉSE

PRÉSENTÉE

COMME EXIGENCE PARTIELLE

DU DOCTORAT EN ADMINISTRATION

PAR

SALMA BEN AMOR

AVRIL 2014

À ma mère,

À mon père,

À mon mari,

À mes deux anges, Osswa et Sima,

À toute la famille Ben Amor et Bensalah

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RÉSUMÉ

La présente thèse examine trois questions fondamentales liées aux émissions initiales d'actions. Le premier chapitre examine les déterminants des opérations de fusions et acquisitions dans les cinq années subséquentes à l'introduction en bourse. Nos résultats montrent que le changement dans la proportion d'actions détenues par les initiés et la présence de spécialistes de capital de risque sont associés positivement à la probabilité qu'une entreprise introduite en bourse s'engage dans des opérations de fusion-acquisition. Nous montrons aussi qu'une plus grande asymétrie d'information affrontée par la cible lors de l'évaluation de l'acquéreur diminue la probabilité de s'engager dans des acquisitions par actions. En outre, il ressort de nos résultats que la probabilité de s'engager dans une série d'acquisition est liée positivement à la sous-évaluation initiale et aux émissions subséquentes.

Le deuxième chapitre examine l'effet des opérations multiples de fusion-acquisition réalisées durant la première année après l'introduction en bourse sur la performance financière à long terme et la survie des entreprises nouvellement introduites. En utilisant différentes approches, nos résultats montrent que la détérioration de la performance sur cinq ans des entreprises ayant réalisées plusieurs acquisitions, pendant la première année, est significativement plus marquée que celle des entreprises ayant effectuées une seule acquisition indépendamment de l'indice de référence utilisé. Nos tests empiriques montrent aussi que la probabilité de non-survie des entreprises introduites en bourse est associée positivement au nombre d'acquisitions réalisées durant la première année après cotation.

Dans le troisième chapitre, nous explorons la relation entre l'utilisation prévue des fonds levés lors de l'introduction en bourse et la performance financière et opérationnelle des entreprises introduites. Nous examinons quatre catégories d'utilisation prévue de fonds : investissement, réduction de la dette, marketing ou promotion des ventes et objectifs généraux. Nos résultats montrent que les entreprises qui ont annoncé que les fonds levés seront utilisés pour des fins d'investissement ont réalisé la plus faible dégradation de la performance financière ou opérationnelle sur les trois ans d'après introduction. Toutefois, lorsque l'utilisation prévue des fonds est le paiement des dettes, la sous-performance devient significativement importante. Nos résultats suggèrent que le marché réagit favorablement aux intentions d'investissement et défavorablement aux intentions de paiements de dettes annoncées par les entreprises.

Mots clés : Émission initiale d'actions, fusions, acquisitions, performance

ABSTRACT

This thesis investigates three fundamental issues regarding initial public offerings (IPOs). The first chapter examines the acquisition motive for IPOs in the five years following their going public. We find that high change in insider ownership post-IPO positively affects the likelihood of an IPO firm to engage in acquisition. Our results also show that venture-backed IPOs are more likely to make acquisitions than their counterparts. We show that high extent of information asymmetry faced by the target when evaluating the acquirer decreases the likelihood of stock-financed acquisitions and that IPO firms with higher underpricing and those conducting seasoned equity offerings (SEOs) are more likely to be frequent acquirers.

The second chapter examines whether making frequent acquisitions in the first year of the IPO affect the long-run stock performance and the survival profile of IPOs differently than do infrequent acquisitions. Using different approaches, we find that frequent acquirers experience significantly poorer performance in the five years following the IPO than infrequent acquirers regardless of the benchmark used. Our empirical tests also show that being a frequent acquirer in the first year after going public increases the probability of not surviving and that the higher the number of acquisitions is, the higher is the probability of not surviving.

In the third chapter, we explore the role of intended use of proceeds on explaining the long run stock and operating performance of IPO firms. We examine four categories of use of proceeds: investment, debt repayment, marketing and sales promotion and general corporate purposes. Our results show that IPOs stated investment as primary use of proceeds exhibits little or no underperformance in the three years following the IPO. However, when the stated use of proceeds is debt payment, IPO firms experience poor and significant underperformance. Our results suggest that the market will react favorably for IPOs specifying investment plans for the use of proceeds while it has less favorable view for those stating debt repayment.

Keywords: initial public offerings, acquisitions, mergers, performance

INTRODUCTION GÉNÉRALE

L'introduction en bourse ou l'émission initiale d'actions représente une étape cruciale dans la vie d'une entreprise. Elle offre aux entreprises émettrices plusieurs avantages. Elle leur donne la possibilité de lever des fonds propres nécessaires pour le financement et le développement de leur croissance. Elle représente un mécanisme de sortie pour les bailleurs de fonds. Elle améliore la notoriété de la société cotée sur le plan financier et commercial, offre une visibilité permanente à travers l'attention régulière portée à l'évolution de ses résultats et renforce sa crédibilité sur le plan national et international qui constitue un vecteur important de croissance.

Les études empiriques sur les introductions en bourse ont généralement examiné le comportement boursier à court, moyen et long terme des entreprises émettrices et tenté d'expliquer plusieurs anomalies qu'on associent aux émissions initiales, par exemples, la sous-évaluation initiale ou «*underpricing*», la contre-performance à long terme et le regroupement des émissions pendant les périodes de fortes activités « *hot issues* ». Récemment, les travaux sur les introductions en bourse se sont orientés vers l'étude des décisions corporatives prises par l'entreprise après son introduction en bourse, notamment les opérations de fusion-acquisition. Ce sujet a suscité l'intérêt de plusieurs chercheurs. Par exemple, Brau et Fawcett (2006) ont envoyé un questionnaire à 336 responsables financiers afin d'identifier les motivations de s'introduite en bourse. Ces auteurs constatent que les deux principales motivations d'une entreprise à s'introduire en bourse est l'établissement d'une valeur au marché des titres et la création d'un moyen de paiement pour les prochaines acquisitions. Cependant, les études empiriques ayant tenté d'expliquer le rôle joué par l'introduction en bourse dans le développement des opérations de fusion-acquisition restent rares. Pourtant, Celikyurt et al. (2010) ont analysé l'activité des fusions et acquisitions de 1295 entreprises introduites en bourse entre 1985 et 2004 et ont constaté que l'appétit de ces entreprises à s'engager dans des transactions d'acquisition a augmenté après leurs introductions en bourse. Également, Ritter et al. (2013) ont montré que le nombre

d'entreprises nouvellement introduites en bourse qui deviennent acquéreuses ou acquises dans les années post-émission a augmenté au cours du temps. Dans ce travail de recherche, nous proposons d'explorer la relation entre l'introduction en bourse et les opérations de fusions et acquisition. Il comporte trois chapitres, visant chacune des objectifs spécifiques et se fondant sur une méthodologie propre.

Le premier chapitre examine les déterminants des opérations de fusion-acquisition réalisées par les entreprises nouvellement introduites en bourse durant les cinq années suivant l'émission. En premier temps, nous testons l'impact du changement de la structure de propriété après la cotation sur la probabilité qu'une entreprise s'engage dans des transactions d'acquisition. Notre objectif est d'évaluer l'effet du changement du pourcentage détenu par les initiés après la cotation sur la probabilité d'effectuer des opérations de fusion-acquisition durant les cinq années après l'introduction en bourse. Par ailleurs, les études antérieures ont montré que les entreprises soutenues par des capital-investisseurs ont une meilleure performance financière. Nous proposons ainsi d'évaluer si l'apport en capital de risque aide l'entreprise nouvellement introduite en bourse à s'engager dans des opérations de fusion-acquisition. En deuxième temps, nous mettons l'accent sur les facteurs qui peuvent expliquer le mode de paiement des opérations d'acquisition post-émission. Celikyurt et al. (2010) ont montré que la sous-évaluation initiale des entreprises introduites en bourse est liée positivement à la probabilité de s'engager dans des acquisitions par actions. Cependant, ces auteurs n'ont pas tenu compte de l'asymétrie d'information qui peut exister entre l'entreprise émettrice et l'entreprise cible. Nous estimons que si l'entreprise cible est confrontée à un niveau élevé d'information asymétrique, elle pourrait refuser l'offre par actions pour éviter de recevoir des actions surévaluées. Nous examinons par la suite le rôle joué par les investisseurs institutionnels dans le choix de mode de paiement. Les travaux antérieurs ont démontré que les investisseurs institutionnels qui détiennent en même temps des actions dans l'entreprise acquéreuse et dans l'entreprise cible participent activement dans la décision d'acquisition et le choix de l'entreprise cible (Matvos et Ostrovsky, 2008; Harford et al., 2011). Cependant, aucune étude empirique n'a examiné l'effet de ces investisseurs communs sur le choix du mode de paiement des acquisitions. Finalement, nous effectuons un lien entre les caractéristiques des entreprises introduites en bourse et le nombre d'acquisitions réalisées

dans les cinq années suivant l'émission. Notre objectif ici est d'expliquer pourquoi une entreprise tend à s'engager dans une série d'acquisitions successives alors qu'une autre ne réalise qu'une seule acquisition durant cette période. Nos résultats montrent que la probabilité de faire une acquisition durant les cinq années suivant l'émission est liée positivement au degré de changement du pourcentage d'actions détenues par les initiés et à la présence d'un capital-investisseur dans le processus d'introduction en bourse. Nous montrons aussi que l'information asymétrique affrontée par la société cible lorsqu'elle évalue les actions de l'entreprise acquéreuse est associée négativement à la probabilité de s'engager dans des acquisitions par actions. De plus, nos résultats montrent que les investisseurs institutionnels communs jouent un rôle important dans le choix de mode de paiement dans les opérations d'acquisition post-émission. Nos tests empiriques révèlent aussi que le degré de sous-évaluation et les émissions subséquentes sont liés positivement à la probabilité qu'une entreprise introduite en bourse réalise plusieurs opérations d'acquisition successives durant les cinq années subséquentes à l'introduction en bourse.

Le deuxième chapitre s'intéresse à l'impact de l'activité de fusion-acquisition sur la performance à long terme et la survie des entreprises introduites en bourse. Les études antérieures ont démontré que les entreprises introduites en bourse ont tendance à effectuer une série d'acquisitions successives dans la courte durée après leur cotation. Celikyurt et al. (2010) constatent que 77% des entreprises introduites en bourse s'engagent dans des opérations de fusion-acquisition dans les cinq années suivant l'introduction et que ces entreprises effectuent, en moyenne, 3,64 acquisitions durant la même période. D'après Hovakimian et al. (2010), les entreprises introduites en bourse accomplissent en moyenne 2 acquisitions durant les 3 ans post-émission. Ce travail se distingue des études antérieures en quatre points. Tout d'abord, nous effectuons une comparaison entre la performance financière à long terme des entreprises introduites en bourse qui ont réalisé une seule acquisition durant la première année après l'émission de celles qui ont réalisé plusieurs acquisitions durant la même période. Ensuite, nous tenons compte du problème de regroupement des acquisitions durant la période de calcul des rentabilités. Notre objectif est de corriger le biais qui peut exister dans le calcul des rendements anormaux puisque tout nouvel évènement corporatif observé durant la période de calcul des rendements peut affecter les résultats obtenus. Étant

donné que les résultats de performance dépendent étroitement du choix du groupe de comparaison dans les méthodes de calcul des rendements anormaux, nous utilisons la méthode d'appariement sur le score de propension (*propensity score matching*). Il s'agit d'une nouvelle technique statistique qui a l'avantage d'apparier les entreprises en tenant compte de plusieurs dimensions simultanément. Ainsi, elle permet de neutraliser le biais de sélection lié au choix du groupe de contrôle. La dernière section du chapitre 2 est consacrée à l'analyse de survie des entreprises introduites en bourse qui s'engagent dans des opérations d'acquisition la première année après la cotation. Nos tests empiriques montrent dans l'ensemble une plus faible sous performance pour les entreprises introduites en bourse qui ont effectué plusieurs acquisitions une année après la cotation. Notre étude de survie révèle que la probabilité de non-survie après l'introduction en bourse augmente avec le nombre d'acquisitions réalisées durant la première année après cotation.

Le troisième chapitre vise à examiner la relation entre l'utilisation prévue des fonds levés lors de l'introduction en bourse et la performance financière et opérationnelle à long terme des entreprises. Les travaux antérieurs ont principalement considéré le cas des émissions subséquentes d'entreprises publiques (Walker et Yost, 2008; Autore et al., 2009) et à notre connaissance, aucune étude antérieure n'a exploré cette question de recherche pour les émissions initiales d'actions. Nous nous intéressons particulièrement à quatre utilisations souvent mentionnées dans les prospectus avant l'introduction en bourse à savoir: (i) le développement de la croissance ou investissement (autrement dit les fonds levés seront utilisés pour financer la croissance à travers soit des acquisitions, des dépenses en recherche et développement ou des dépenses d'investissement du capital), (ii) la réduction de la dette, (iii) la promotion des ventes ou marketing, et (iv) objectifs généraux (les entreprises qui ont choisi de ne pas donner une raison claire pour leur utilisation). Dans l'ensemble, nos analyses révèlent qu'il y a une différence significative entre les performances financières et opérationnelles des quatre groupes étudiés. Plus spécifiquement, une plus faible performance est observée pour les entreprises qui ont déclaré que les fonds levés seront utilisés pour payer une partie de la dette.

CHAPITRE I

ARTICLE 1

ARE IPO FIRMS HUNGRY FOR M&A?

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ABSTRACT

We investigate the acquisition motive for initial public offerings (IPO) in the five years following their IPO. We find that high change in insider ownership post-PO positively influence the likelihood of an IPO firm to engage in acquisition and that venture-backed IPOs are more likely to make acquisitions than their counterparts. We also show that high extent of information asymmetry faced by the target when evaluating the acquirer decreases the likelihood of stock-financed acquisitions. Furthermore, we find that IPO firms with higher underpricing and those that make seasoned equity offerings are significantly more likely to be frequent acquirers. Overall, our findings confirm that an IPO represents an opportunity for new issuers to become acquirers and even frequent acquirers.

JEL: G32, G34
Keywords: initial public offerings, acquisitions, mergers

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1.1 Introduction

"I see M&A as the upside to our core case. There are a lot of opportunities to build our position, both in frozen and dry (foods)."[1]

- Robert Gamgort, Pinnacle Foods CEO - after Pinnacle Foods' IPO (March 28th, 2013)

Why some firms go public while others continue to be 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 become public limits the development of empirical research. Pagano et al. (1998) have conducted one of the few empirical studies[2] 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 held firms in Italy, they find that Italian firms go public to rebalance their capital structure after a period of high investment and growth rather than finance subsequent investment. Other studies have used surveys of corporate executives to empirically test the motivation for going public. For instance, Brau and Fawcett (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 and Fawcett (2006)'s findings, Celikyurt et al. (2010) explore the acquisition motive for IPOs. Their results show that 77% of firms make at least one acquisition within the first five years of the IPO and that the typical IPO firm makes four acquisitions in this five-year period. Wiggenhorn et al. (2007) examine the acquisition activity of over 5,000 US firms that went public during the 1992-2001 time period and find that there were more than 400 acquisitions made by newly public firms within a year of going public, while less than 100 were targeted for takeovers. Hovakimian and Hutton (2010) find that 36% of IPOs complete at least one acquisition in the three years following

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[1] Robert Gamgort, Pinnacle Foods CEO was Interviewed after Pinnacle Foods' IPO (March 28th, 2013) at CNBC's "*Squawk on the Street*" and reported by Paul Toscano (http://www.cnbc.com/id/100600175).

[2] Rosen et al. (2005) also 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.

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, using the cash raised at the IPO. Ritter et al. (2013) also confirm that too many IPO firms are subsequently involved in M&A deals, either as a target or an acquirer. Hsieh et al. (2011) propose a model that links a firm's decision to go public 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 find that the costs of going public are positively related to the likelihood of observing a merger within five years of an IPO.

Our study contributes to this literature in several ways. First, we examine why IPO firms become acquirers shortly after their going public. In particular, we investigate the impact of post-IPO change in insider ownership on the likelihood of making acquisitions in the post-IPO period. Our rationale is that ownership dispersion following IPO could increase agency problems between shareholders and managers who may refuse any corporate decisions for entrenchment purposes (Jensen and Meckling, 1976; Mikkleson, 1997). Additionally, the role of venture capital in the IPO market is important and has been the subject of considerable debate in finance. For instance, numerous studies have examined the influence of venture capitalist stock holdings on IPO firm valuation, underpricing, and long-term performance (see Megginson and Weiss, 1991; Barry et al., 1990; Brav and Gompers, 1997, among others). In this paper, we contribute to this strand of literature by examining 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 influences the likelihood of IPO firms to conduct acquisitions during this period.

Second, we investigate the method of payment in M&As following IPO. Celikyurt et al. (2010) show that an IPO creates publicly traded stock that can be used as a form of payment for acquisitions. They suggest that IPO firms with greater underpricing conduct more stock-financed acquisitions. However, these authors do not consider the level of information asymmetry faced by the target firm when evaluating the IPO acquirer. We expect that an IPO firm could use their overvalued stocks to pay for acquisitions only when the target shows a willingness to accept such an offer. Otherwise, the deal would not succeed. In other words,

the degree of information asymmetry faced by the target when evaluating the acquirer could decrease the likelihood of an IPO firm with high level of underpricing to engage in a stock-financed acquisition. In addition, we explore whether institutional cross-holdings influence the payment method in post-IPO acquisitions. This issue is not addressed in prior literature although previous studies argue that institutional shareholders could affect managerial corporate decisions including M&As (Harford and Li, 2007; Harford et al., 2011).

Third, our paper innovates by distinguishing between frequent and infrequent acquirers and examining why some IPO firms engage in only one acquisition while others carry out frequent acquisitions in the years immediately following their IPO. The comparison between these two types of acquirers could indeed add to our understanding of managerial behaviour.

Finally, we cover the period from January 1980 to December 2010 and use a larger sample of IPOs[3] (6,705) than those found in previous studies which allows us to draw conclusions with greater confidence.

We find that higher change in insider ownership following IPO increases the probability of IPO mergers in the five years following the IPO, suggesting that IPOs in which post-IPO insider ownership remains high tend to avoid acquisitions in the post-IPO period. This result could be explained by managerial entrenchment purposes. Consistent with the predictions of the venture backing hypothesis, we find that venture-backed IPOs are more likely to engage in acquisitions within five years following IPO than non-venture-backed IPOs. However, they are less likely to engage in M&A activity during the lockup period, suggesting that the pressure of venture capitalists to disengage from the IPO firm may drive them to avoid acquisitions during this period as any new corporate event will change the fundamentals and the risk profile of the company.

Examining the determinants of payment method in post-IPO acquisitions, we find that IPOs with high degree of underpricing conduct more stock-financed acquisitions after the

[3] Our final sample includes 2,547 IPOs firms involved in 5,853 mergers and 4,158 IPOs firms that did not conduct any acquisitions during the five years following the IPO date. Hovakimian and Hutton (2010)'s sample, for example, includes 2,059 IPO firms conducting 4,265 mergers and 3,712 IPO firms without any acquisitions in the first three years after the IPO. Celikyurt et al. (2010) consider 1,295 IPOs with IPO proceeds greater than $100 million (in 2004 dollars).

IPO. However, higher extent of information asymmetry faced by the target when evaluating the acquirer decreases the likelihood of stock being used in acquisitions. Our results show that IPO firms may not be able to exploit their overvalued stocks to pay for acquisitions when there is a high level of information asymmetry between the acquirer and the target. Investigating the role of cross-holdings in explaining which acquisition payment method IPO firms may choose, we find that IPO acquirers with a high level of cross-holdings are more likely to conduct stock-financed acquisitions.

Overall, our results suggest that specific IPO characteristics significantly influence not only post-IPO acquisition decisions, but also the choice of the payment method in such events. Our findings also show that IPOs with higher underpricing and those that make seasoned equity offerings are significantly more likely to be frequent acquirers

The paper is organized as follows. In section 2, we present our hypotheses. Data and sample selection are discussed in section 3. In section 4, we present our empirical results. Section 5 analyses the determinants of frequent acquisitions by IPO firms. In section 6, we run some robustness tests. Section 7 concludes.

1.2. Hypotheses development and construction of variables

Our first and second hypotheses focus on the effects of ownership structure and venture capital backing on the likelihood of an acquisition, while our third and fourth hypotheses focus on the effects of information asymmetry and cross-holdings on the acquisition method of payment in post-IPO M&As.

1.2.1 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 after the IPO. Mikkelson et al. (1997) analyse a sample of 283

U.S. IPOs that occurred during the 1980-1983 period. They find that the median ownership stake of the officers and directors declines significantly from the year before the IPO to ten years later. Roosenboom and Goot (2005) examine the ownership structure of 118 IPOs in the 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 the pre-issue ownership structure on 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 blockholder ownership emerges, representing 3.62%. Besides the change in the ownership structure, IPOs also drive the dilution of stock ownership, which could increase agency problems between managers and shareholders. Jensen and Meckling (1976) argue that the interest of managers and other stockholders becomes less closely aligned as managers' 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 newly public firms decide to engage in acquisition. Managers who are afraid of losing control and motivated by managerial entrenchment are more likely to pursue their own interest rather than that of the shareholders in 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 their firms. To the extent that the funds raised in IPOs increase the free cash flow available to the firms' managers, conflicts of interest between shareholders and managers tend to be more severe. Taking these results into account, we expect that IPO firms with high change in their insider ownership may be inclined to engage in more acquisitions following IPO. Therefore, we predict the following:

H1: The likelihood of an IPO firm to engage in an acquisition is positively associated with the change in their insider ownership.

To test this 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 absolute value of the difference between post-IPO and pre-IPO inside ownership as reported in the Thomson Financial's SDC New Issues database.

1.2.2 Venture capital backing hypothesis

Numerous studies have examined the influence of venture capitalist (VC) stock holdings on IPO firm valuation, underpricing, and long-term performance. Megginson and Weiss (1991) examine the role of VC certification 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 in since they own significant equity positions and therefore can participate directly in the governance of their portfolio firms. They find that ownership, the length of board service, and the number of venture capitalists invested in the pre-IPO firm are negatively related to IPO underpricing. Brav and Gompers (1997) examine the effect of VCs on the long-run performance of newly public firms using a sample of 934 venture-backed IPOs and 3,407 non-venture-backed IPOs during the period 1972-1992. They find that VC IPOs outperform non-VC IPOs using equally weighted returns. Krishnan et al. (2011) examine the relation between several VC reputation measures and subsequent IPO issuer performance. They confirm that VC reputation affects the long-term performance of IPOs. Ragozzino and Reuer (2007) consider IPOs as an information diffusion mechanism that can help to reduce the information asymmetry between bidders and target firms in M&A activity. They suggest that the involvement of a VC at the time of an IPO can signal the quality of an entrepreneurial firm. 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 a newly public firm generally needs. We predict the following hypothesis:

H2a: VC-backed IPO firms are more likely to conduct an acquisition after the offering that non-VC-backed ones.

Nevertheless, newly public firms could suffer from the venture capitalist involvement 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 could be associated with a larger number of shares coming to market when the lock-up expires. Field and Hanka (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 an 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. This leads to the following hypothesis:

H2b: VC-backed IPOs are less likely to make acquisitions during the lockup period than non-VC-backed IPOs.

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 and Capron (2010), 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 expiration date.

1.2.3 Information asymmetry and the acquisition currency hypothesis

Prior empirical studies argue that an IPO creates publicly traded stock that can be used by newly public firms as a form of acquisition payment. Given the information asymmetry

between bidders and potential target firms, 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 acquisitions, survive, and grow, while firms with undervalued equity are more likely to become takeover targets. Celikyurt et al. (2010) find that IPO firms with high degree of underpricing conduct more stock-financed acquisitions after the IPO. They suggest that firms go public to exploit acquisition opportunities when their equity is overvalued. However, 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 an offer. When faced with an equity offer, the target might realize that the IPO firm wishes to use overvalued stocks to pay for the acquisition and thus might refuse the offer. Chemmanur et al. (2009) examine a sample of publicly traded acquirers and target firms involved in 817 acquisitions announced between 1978 and 2004. They find that a higher probability of cash offerings is associated with high extent of information asymmetry faced by the target when evaluating the acquirer. They suggest that the choice of the exchange medium in acquisitions is determined by the private information held simultaneously by the acquirer and target firm. Consistent with this view, we consider that the success of a stock-financed acquisition using overvalued stocks is related to the degree of the information asymmetry the target faces when evaluating the acquirer. Thus, we propose the following:

H3: The probability of stock-financed acquisitions is negatively associated with the extent of information asymmetry faced by the target in its evaluation of the acquirer.

Following Celikyurt et al. (2010), we use *Underpricing* as a measure of overvaluation around the IPO, which is 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 over the offer price. To measure the extent of information asymmetry faced by the target when evaluating the acquirer, we use two proxies as Chemmanur, Paeglis, and Simonyan (2009). The first one is the number of analysts following the acquirer (*NUMA*). A higher number of analysts implies lower information asymmetry. Bhushan (1989) shows that more analysts following indicates 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 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.

1.2.4 Cross-holdings hypothesis

Recent empirical studies emphasize the influence of shareholder cross-holdings on managerial corporate decisions including M&As. Matvos and Ostrovsky (2008) suggest that institutional shareholders of acquiring companies which hold substantial stakes in the target firms are more likely to vote for mergers with negative acquirer announcement returns because they can make up for the acquirers' losses 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 the bidder managers consider their shareholders' cross-holdings when selecting merger targets. Other studies argue that deals driven by acquirer stock overvaluation do not produce the necessary synergy gains (Harford and Li, 2007; Gu and Lev, 2011). Fangjian et al. (2012) find a decrease in the acquirer's stock price and an increase in the target's stock price after the deal announcement for acquisition motivated by acquirer stock overvaluation. They suggest that targets in acquisition by overvalued acquirers realize higher premiums.

Nonetheless, examining whether cross-holdings affect the method of acquisition payment has been neglected in past empirical studies. We expect that IPO firms tend to use stocks to pay for future acquisitions if high level of IPO institutional shareholders own shares in the target firms as they could offset their potential losses on acquirer shares with gains in target ones. Therefore, we propose the following hypothesis:

H4: The probability of stock-financed acquisitions is positively associated with the level of institutional cross-holdings.

Cross-holding exists when a bidder shareholder also holds shares in the target firm. Our main measure for cross-ownership is the number of institutional bidder shareholders that own shares in the target (*NUMCRH*). We also use *COM_HOLD*, a variable that measures the percentage of the bidder and target firm's shares that are cross held. We likewise 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 payment method in post-IPO mergers. Furthermore, given the fact that large shareholders are more likely to have the ability to influence the corporate decisions of the bidding managers, we consider that large cross-owners could have an effect on the payment method in acquisitions. We define a large cross-owner as an institutional shareholder who owns more than 5% in the firm. To test this effect, we consider two variables: (1) *LARBCR*, a dummy variable taking the value of one if there is a large cross-owner in the bidder's equity, and zero otherwise; (2) *LARTCR*, a dummy variable taking the value of one if there is a large cross-owner in the target's equity, and zero otherwise.

1.2.5 Control variables

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 payment method. We use total gross proceeds (*Proceeds*) defined as the raised capital at the time of the offering. The total gross proceeds is also a proxy for IPO firm size. We also control for the use of a prestigious underwriter, using the rankings of Loughran and

Ritter (2004)[4]. We define the variable *Prestige*, a dummy variable that takes the value of one if the IPO's underwriter is in the top tier (ranks 8 and 9), and zero otherwise. We also include a dummy variable *Private* that takes the value of one if the target is a private firm, and zero otherwise. We also use *Relatedness*, a dummy variable that takes the value of 1 if the target firm is in the same 3 digit SIC code as the acquirer, and zero otherwise.

To control for the effect of periods of high M&A activity, we use Harford's (2005) industry merge wave indicator. A merger wave is identified when the number of acquisitions over 24 months exceeds the 95th percentile of the simulated probability distribution based on ten years of M&A activity. We define *Merger wave,* a dummy variable taken the value of 1 if an M&A wave occurs in any of the five post-IPO years we consider.

To control for subsequent raised capital in the five years following the IPO, we define *SEO*, a dummy variable that takes the value of 1 if the IPO firm conducts an SEO during the five years following the IPO, and zero otherwise. We also use *Bubble*, a dummy variable that takes the value of 1 for IPOs during 1999 and 2000, and zero otherwise to control for the bubble period. Table 1.1 summarizes the definitions of all the variables considered and their expected sign.

[4] We thank Professor Jay. R. Ritter for making IPO underwriter reputation rankings data available on his web site.

Table 1.1 Variables, descriptions and their expected signs

Variable name	Description	Expected sign
Primary variables		
CHINS	Insider ownership changes defined as the absolute value of the difference between post-IPO and pre-IPO inside ownership	(+)
NUMCRH	The number of cross-holdings	(+)
COM_HOLD	The percentage of bidder and target shares that are cross held.	(+)
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.	(+)
VC backed	Dummy variable: 1 if the IPO is backed by a venture capital firm and zero otherwise.	(+)
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	(-)
Control variables		
Proceeds	The natural logarithm of total proceeds	(-)
Prestige	Dummy variable: 1 if the underwriter is top tier and 0 otherwise	(+)
Private	Dummy variable: 1 if the target is private and zero otherwise.	(+)
Merger wave	Dummy variable: dummy variable taken the value of 1 if an M&A wave occurs in any of the five post-IPO years we consider, and zero otherwise.	(+)
Bubble	Dummy variable: 1 for bubble IPO market, and zero otherwise	(+)
SEO	Dummy variable: 1 if the IPO firm conducts an SEO during the five years following the IPO, and zero otherwise.	(-)
Relatedness	Dummy variable: 1 if the target firm is in the same 3 digit SIC code as the acquirer, and zero otherwise.	(+)

1.3 Data and sample selection

To construct our initial sample of IPOs and mergers, we use 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 prices 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 require that the merger transaction value exceed $1 million. Additionally, we restrict our focus only to acquisitions of private, public and subsidiary targets. The resulting set contains 31,726 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, resulting 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 IPO firms involved in 5,853 mergers. The remaining IPO firms did not conduct any acquisitions 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 Holdings (13f) database. The sample size varies for different tests and hypotheses due to the availability of necessary data items.

Table 1.2 reports descriptive statistics for the IPO sample. The number of IPOs in our sample and the total proceeds 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 20.89%. When we exclude the 1999-2000 period (where underpricing levels averaged 65%), we calculate an average underpricing level of 13%.

Table 1.2 Descriptive statistics of IPO sample.

IPO year	Number of IPOs	% of IPOs making acquisitions	Average % of IPO underpricing	Average 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 1.3 presents descriptive statistics for the M&A sample. A large number of acquisitions occurred between 1994 and 2000 with an average of 1,907 acquisitions. The total acquisition amount reached its highest level in 1999 and 2000, which coincides with the highest IPO proceeds. As Rau and Stouraitis (2011) and Hovakimian and Hutton (2010) point out, this result suggests that IPO waves are followed by an increase in the aggregate merger activity[5]. Figures 1.1 and 1.2 confirm our observation.

[5] Schultz and Zaman (2001) confirm that internet IPOs in the late 1990s were followed by series of acquisitions.

Table1.3 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

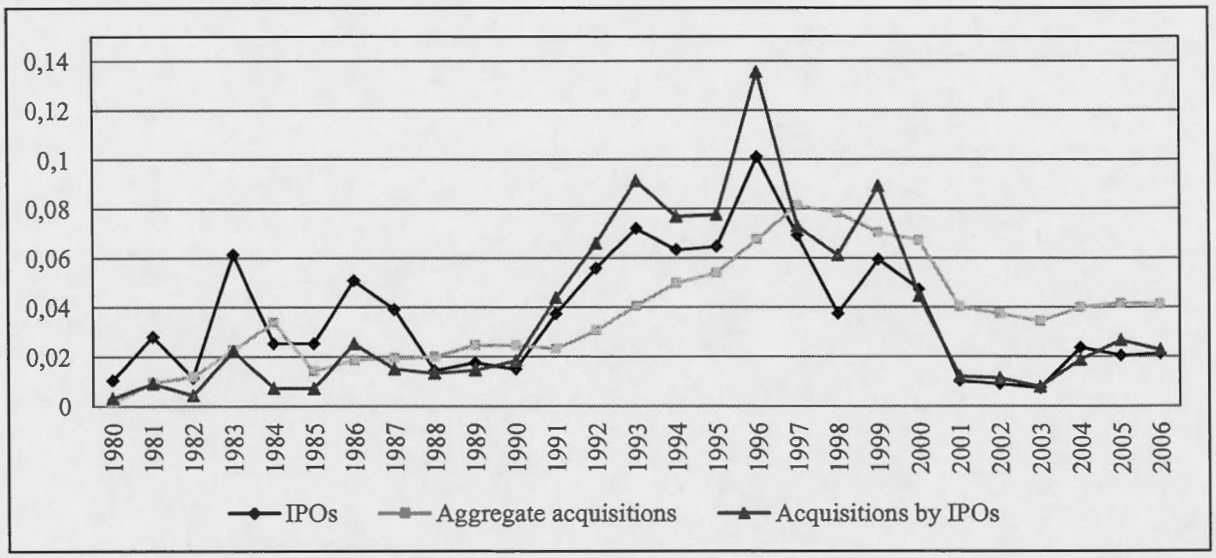

Figure1.1 Aggregate IPO activity, aggregate acquisition activity and acquisition activity by IPOs

Note: This figure presents aggregate IPO, aggregate acquisition activity and acquisition activity 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.

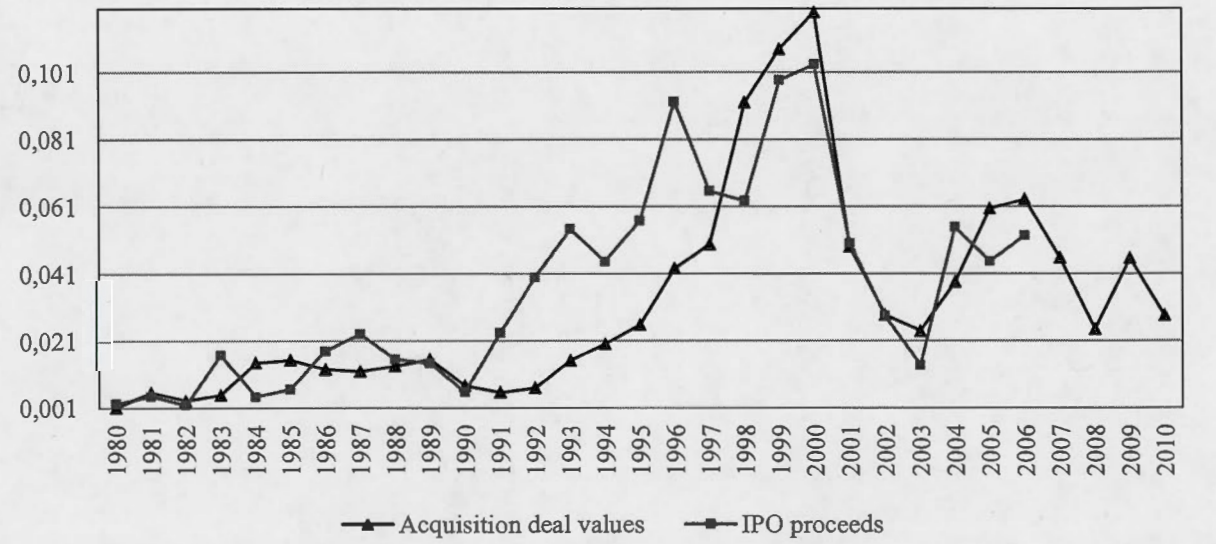

Figure 1.2 Acquisition deal values and IPO proceeds by year

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

Table 1.4 summarizes the acquisition activity undertaken by IPO firms for windows extending up 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 in year 1. These observations confirm those of Celikyurt et al. (2010) and Brau et al. (2012), namely that a significant number of firms become acquirers shortly after the IPO. Moreover, we find that many firms make more than one acquisition within five years following their IPO[6]. The average number of acquisitions by an IPO firm is 2.33, while the median number of acquisitions in the first five years after going public is 2. In Table 1.4, we also present frequent acquisitions year by year. We define a frequent acquirer as 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 immediately following their IPOs.

Table 1.4 Acquisition activity of IPO firms over time

	Year 0	Year 1	Year 2	Year 3	Year 4
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

Figure1.3 shows aggregate acquisitions, aggregate IPOs, and IPOs making acquisitions by industry. We observe that IPO firms make more acquisitions in manufacturing and service industry groups than in other industry groups.

[6] While our main focus in this paper is on M&A as a motivation to go public, we should mention that some IPO firms do not become acquirers over their first five years for several reasons (e.g. financial distress or bankruptcy, going private, become acquisition target, etc.). We leave these issues for future research.

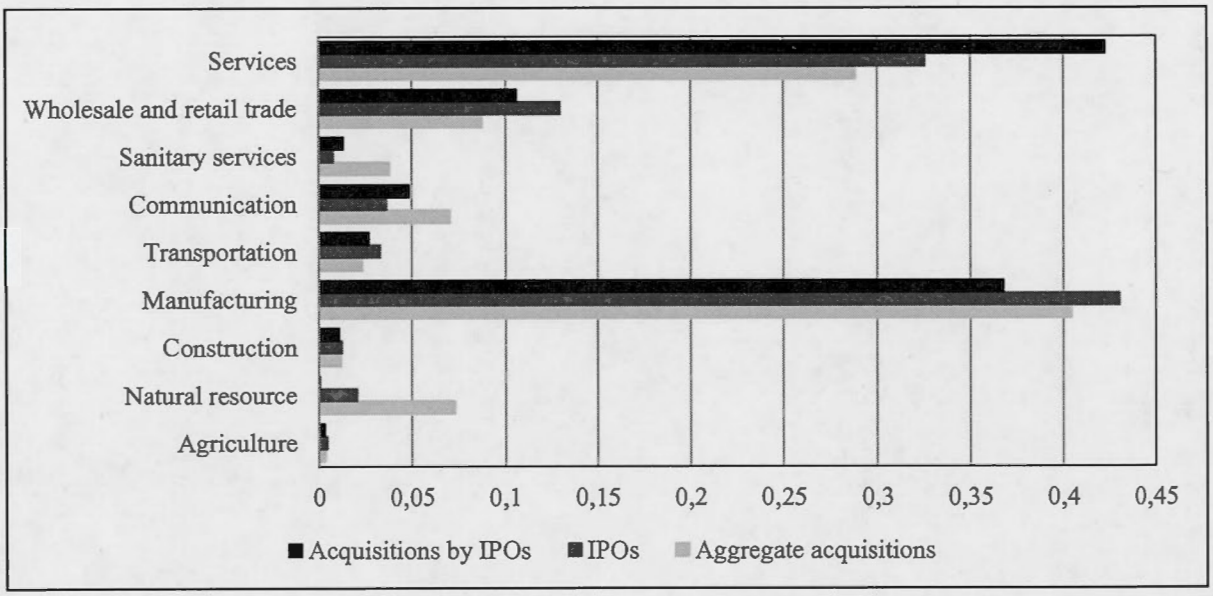

Figure 1.3 Number of acquisitions, number of IPOs and number of IPOs making acquisitions by industry

Note: 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.

1.4 Results

1.4.1 Univariate results

Panel A of Table 1.5 presents the summary statistics for IPO firms making acquisitions and those that do not during the five years following their IPO. We find that IPOs making acquisitions in the five years following their IPO are significantly more underpriced than those that do not. The mean underpricing of IPO firms making acquisitions is 27%, whereas it is 20% for those that do not. Our results show that venture backed IPOs are significantly more likely to engage in acquisitions than non-venture backed IPOs. We also find that change in insider ownership is significantly higher for IPOs making acquisitions as compared to those that do not.

Panel B of Table 1.5 presents summary statistics for cash and stock acquisitions. 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 40% as compared to 24% for IPO acquirers in cash acquisitions. The mean proceeds at the IPO date is significantly higher for IPOs that conducted cash acquisitions than for those that conducted stock acquisitions, thereby supporting the capital infusion hypothesis of Celikyurt et al. (2010). IPO firms seem to use their stocks to pay for acquisitions in periods of high M&A activity and during the bubble period. We find significant differences in means and medians for the variables *Bubble* and *Merger wave*. Comparing the means and medians of the proxies for information asymmetry, we find that *NUMA* is significantly higher for stock acquisitions than for cash acquisitions. The mean number of analysts following the acquirer is 5.29 for stock acquisitions, whereas it is 4.60 for cash acquisitions. Our results also indicate larger standard deviation of analyst forecasts following the acquirer in cash-financed acquisition although this result is not statistically significant.

Table 1.5 Summary statistics and univariate tests

Panel A: Summary statistics and univariate tests for IPOs that did not make acquisitions and IPOs that did

	Total	IPOs that did not make acquisitions				IPOs that make acquisitions				Difference	Difference
		N	Mean	Median	STD	N	Mean	Median	STD	in means	in medians
Underpricing	1754	908	0.20	0.09	0.45	846	0.27	0.14	0.48	-0.07 (-3.23)***	-0.05 (-4.82)***
Proceeds	1754	908	3.44	3.48	0.96	846	3.65	3.63	0.87	-0.21 (-4.83)***	-0.15 (-5.04)***
Prestige	1754	908	0.55	1	0.49	846	0.63	1	0.48	-0.07 (-3.11)***	0.00 (-3.10)***
VC backed	1754	908	0.45	0	0.49	846	0.50	1	0.50	-0.05 (-2.13)***	-1.00 (-3.10)***
CHINS	1754	908	0.18	0.16	0.12	846	0.24	0.18	0.35	-0.05 (-4.33)***	-0.02 (-4.49)***
SEO	1754	908	0.31	0	0.46	846	0.46	0	0.50	-0.14*** (-6.24)	0*** (-6.17)
Bubble	1754	908	0.13	0	0.34	846	0.17	0	0.37	-0.04*** (-2.29)	0*** (-2.29)
Merger wave	1754	908	0.17	0	0.38	846	0.20	0	0.40	-0.03** (-1.99)	0.00** (-1.99)

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	2010	1211	0.24	0.11	0.54	799	0.40	0.18	0.64	-0.16 (-5.85)***	-0.09 (-6.97)***
Proceeds	2010	1211	3.92	3.93	0.97	799	3.72	3.63	0.87	0.19 (4.67)***	0.30 (5.16)***
Prestige	2010	1211	0.68	1	0.46	799	0.77	1	0.42	-0.08 (-4.11)***	0.00 (-4.10)***
VC backed	2010	1211	0.45	0	0.50	799	0.59	1	0.49	-0.14*** (-6.54)	-1.00*** (-6.48)
Private	2010	1211	0.57	1	0.48	799	0.72	1	0.45	-0.14 (-6.82)***	0.00 (-6.74)***
Bubble	2010	1211	0.10	0	0.30	799	0.18	0	0.38	-0.07 (-5.10)***	0.00 (-5.07)***
Merger wave	2010	1211	0.17	0	0.37	799	0.32	0	0.47	-0.15 (-7.91)***	0.00 (-7.99)***
SEO	2010	1211	0.19	0	0.39	799	0.16	0	0.36	0.03 (1.86)*	0.00 (1.86)*
Relatedness	2010	1211	0.62	1	0.48	799	0.61	1	0.49	0.01 (0.03)	0.00 (0.03)
NUMA	1823	1114	4.60	3	3.62	709	5.29	4	4.36	-0.68 (-3.62)***	-1.00 (-4.03)***
STDFOR	1119	753	0.04	0.02	0.03	441	0.03	0.02	0.02	0.01 (0.31)	0.00 (0.04)
NUMCRH	164	48	2.00	2.07	0.98	116	2.50	2.48	1.02	-0.50 (-2.88)***	-0.41 (-2.66)***

Note: 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; it is 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 in the 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. *Lockup* is the natural logarithm of the number of days between the IPO date and expiration date. *CHINS* is the absolute value of the difference between post-IPO and pre-IPO inside ownership. *SEO* is a dummy variable that takes the value of 1 if the IPO firm conducts an SEO during the five years following the IPO, and zero otherwise. *Bubble* is a dummy variable that takes the value of 1 for IPOs during 1999 and 2000, and zero otherwise. *Merger wave* is a dummy variable taken the value of 1 if an M&A wave occurs in any of the five post-IPO years we consider, and zero otherwise. *Private* is a dummy that takes the value of 1 if the target is a privately held firm and zero otherwise. *Relatedness* is a dummy that takes the value of 1 if the acquirer and the target are in the same industry and 0 otherwise. *NUMA* is the number of analysts following the acquirer. *SDTFOR* is the standard deviation of analysts' earnings forecasts about the acquirer. *NUMCRH* is the natural logarithm of the number of cross-holdings. 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

1.4.2 Determinants of post-IPO acquisition activity

We run the following logit regression[7] to test the effect of IPO characteristics on the likelihood of an acquisition:

$$Y_i = \beta_0 + \beta_1 Underpricing_i + \beta_2 Proceeds_i + \beta_3 Prestige_i + \beta_4 VC\ backed_i + \beta_5\ SEO_i + \beta_6 CHINS_i + \beta_7 Bubble_i + \beta_8 Merger\ wave_i + \varepsilon_i \quad (1)$$

The dependent variable in regression (1) takes the value of 1 if an IPO firm makes at least one acquisition during the five years following its IPO, and zero otherwise. Table 1.6 shows the results. We find that the degree of underpricing is a positive and significant determinant of making acquisition within the first five years following IPO, suggesting that IPO firms with a higher degree of underpricing are more likely to involve in M&A transactions. We also find that firms with higher proceeds are more likely to engage in acquisitions following the IPO. Thus, the capital raised from the initial offering help newly public firms to grow through acquisitions. The subsequent capital raised via seasoned equity offerings also seems to influence the ability of an IPO firm to conduct acquisitions shortly after their going public decision. The coefficient of *SEO* is positive and significant at the 1%

[7] We also consider a Tobit estimation to take into account the number of M&A after going public and our results remain qualitatively unchanged.

level. Thus, conducting an SEO within the five years following the IPO increases the likelihood of an IPO firm to conduct acquisition[8]. Testing our ownership structure hypothesis, we find a positive and significant relation at the 1% level between *CHINS* and the probability of making acquisitions within 5 years following IPO. This suggests that a higher decline in insider ownership following IPO is associated with a higher probability of IPO mergers[9], supporting H1. Our results also show that the coefficient of *VC backed* is positive and significant which indicates that VC-backed IPOs are significantly more likely to conduct acquisitions than non-VC-backed IPOs in the five years following the IPO, providing support for H2a.

During the lockup period, company insiders are forbidden by definition to sell any of their shares. Consequently, IPO firms are restricted from making corporate events during this period. Venture capitalists who desire to cash out quickly after the firm goes public may make pressure on management teams to avoid any acquisition during the lockup period. To test this hypothesis, we run the following regression:

$$Y_i = \beta_0 + \beta_1 Underpricing_i + \beta_2 Proceeds_i + \beta_3 Prestige_i + \beta_4 VC\ backed_i + \beta_5\ SEO_i + \beta_6 CHINS_i + \beta_7 Bubble_i + \beta_8 Merger\ wave_i + \beta_9 Lockup_i + \beta_{10} VC\ backed * Lockup_i + \varepsilon_i \quad (2)$$

The dependent variable takes the value of 1 if an IPO firm makes an acquisition during the lockup period, and zero otherwise. We use the Heckman procedure to correct for the selection bias since we are interested only in IPO acquirers. In the first stage, we use a probit

[8] We also estimate eq. (1) using the number of SEOs made in the five years following IPO Instead of a dummy variable (*SEO*) and find that the higher the number of SEOs is, the higher is the likelihood to engage in M&As activity.

[9] Gao and Jain (2012) consider a sample of 1,963 firms that conducted an IPO during the period 1997-2000 and also find that the presence of founder CEOs lowers the probability of post-IPO change of control. Further, Bauguess and Stegemoller (2008) examine the effect of ownership structure on the firms' likelihood of making an acquisition using S&P500 firms from 1994 to 2005. They find that family owned firms and firms with high proportions of inside ownership are significantly less likely to acquire, and when they do, they destroy shareholder value.

model to estimate the selection equation based on whether or not the IPO firm makes an acquisition in the five years following the IPO. We estimate the following equation[10]:

$$y_i = \alpha_1 + \alpha_2 Proceeds_i + \alpha_3 Prestige_i + \alpha_4 SEO_i + \alpha_5 Underpricing_i + \varepsilon_i \quad (3)$$

Where y_i=1 for IPO acquirers within 5 years of IPO, and zero otherwise.

In the second stage, we add the inverse Mills ratio to our explanatory variables in eq. (2) and estimate it using the logit procedure. The results are presented in columns 2 and 3 of Table 1.6. We find that the coefficient of *VC backed* is negative and significant at the 5 % level (-5.14, *t*-statistic = -2.10). Thus, venture capital IPOs are significantly less likely to engage in acquisitions during the lockup period than non-venture capital IPOs, confirming H2b. To the extent that VC backing and the lockup period are complements – since the earliest possible time the venture capitalists tends to dispose of their shares is when the lockup agreement expires – we explore whether the lockup period interacting with VC backing influences the probability of an IPO firm to engage in M&A activity. Column 4 of Table 1.6 shows that the coefficient of *VC backed*Lockup* is positive and significant at the 5 % level (1.01, *t*-statistic = 2.16). This implies that the longer the lockup period is, the higher the probability of a venture backed IPO firm making an acquisition during this period. A longer lockup period could indeed increase the investors' confidence about the quality of the decisions made after the IPO and encourage venture capitalists to accept any corporate decisions such as acquisitions. Arthurs et al. (2009) also find that the lockup period length could be used as a signal of last resort to communicate firm value.

[10] The same selection equation is used for all the regressions when we should correct for the sample selection bias.

Table 1.6 IPO characteristics and the likelihood of an acquisition

	Five years following the IPO	During the lockup period	
	(1)	(2)	(3)
Constant	-1.52***	-42.80***	-43.77**
	(-5.91)	(-2.75)	(-2.55)
Underpricing	0.20*	3.55**	4.62***
	(1.69)	(2.31)	(2.72)
Proceeds	0.21***	2.54**	3.03**
	(3.06)	(2.32)	(2.52)
Prestige	0.03	0.44	0.61
	(0.26)	(1.05)	(1.35)
VC backed	0.21*	0.28	-5.14**
	(1.92)	(1.51)	(-2.10)
Lockup		1.56***	
		(5.17)	
VC backed*Lockup			1.01**
			(2.16)
SEO	0.68***	-0.11	-0.17
	(6.38)	(-0.64)	(-0.99)
CHINS	2.99***	0.22	0.22
	(7.79)	(0.75)	(0.75)
Bubble	-0.04	-0.19	-0.40
	(-0.19)	(-0.18)	(-0.37)
Merger wave	0.18	0.35	0.56*
	(0.99)	(1.14)	(1.86)
Invmills		26.70**	34.89**
		(2.14)	(2.54)
Industry dummy	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes
Observations	1,739	789	789
Pseudo R^2	0.08	0.09	0.07

Note: In model 1, the dependent variable takes the value of 1 if an IPO firm makes at least one acquisition in the five years following the IPO, and 0 otherwise. In models 2 and 3, the dependent variable takes the value of 1 if an IPO firm makes an acquisition during the lockup period, and zero otherwise. *Underpricing* is the price run-up in the first trading day after the IPO. It is defined as the difference between the first day closing price and the offer price given as a percentage of the offer price. *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. *VC backed* is a dummy variable taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *Lockup* is the natural logarithm of the number of days between the IPO date and expiration date (lockup). *SEO* is a dummy variable that takes the value of 1 if the IPO firm conducts a seasoned equity offerings during the first 5 years following the IPO, and zero otherwise. *CHINS* is the absolute value of the difference between post-IPO and pre-IPO inside ownership. *Bubble* is a dummy variable that takes the value of 1 for IPOs during 1999 and 2000, and zero otherwise. *Merger wave* is a dummy variable taken the value of 1 if an M&A wave occurs in any of the five post-IPO years we consider, and zero otherwise. The inverse Mills ratio (*Invmills*) is included in models 2 and 3. The regressions also include a constant term, year and industry dummies. For each independent variable, the first row reports its estimated coefficient and the second row, the corresponding robust *t*-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level respectively.

1.4.3 Determinants of payment method in post-IPO acquisitions

Table 1.7 reports the results of the following regression designed to test hypothesis 3:

$$Y_{it} = \beta_0 + \beta_1 Underpricing_{it} + \beta_2 Proceeds_{it} + \beta_3 Prestige_{it} + \beta_4 VC\ backed_{it} + \beta_5 Private_{it} + + \beta_6\ Bubble_{it} + \beta_7\ Merger\ wave_{it} + \beta_8\ SEO_{it} + \beta_9 Relatedness_{it} + \beta_{10} NUMA_{it} + \beta_{11} STDFOR_{it} + \beta_{12} Underpricing_{it} * NUMA_{it} + \beta_{13} Underpricing * STDFOR_{it} + \varepsilon_{it} \quad (4)$$

To estimate regression (4), we use Heckman's (1979) method to correct for sample selectivity bias. We find that firms with a higher degree of IPO underpricing are more likely to conduct stock-financed acquisitions following IPO. Our results show that the coefficient of *Underpricing* is positive and significant at the 5% level for year 0 (0.81, *t*-statistic= 2.07) and over years 0-4 (0.36, *t*-statistic= 2.38), with a higher coefficient is observed for year 0. This implies that the effect of IPO underpricing on the probability of stock-financed transactions is more pronounced during the IPO year.

The results for our different proxies of the extent of information asymmetry faced by the target when evaluating the acquirer support our hypothesis. Specifically, we find that the coefficient of *NUMA* is positive and statistically significant at the 1% level over years 0-4 (0.07, *t*-statistic = 4.43). Thus, a higher number of analysts forecast following IPO acquirer increases significantly the likelihood of stock-financed acquisitions over years 0-4. As discussed above, as more analysts follow the firm, more information is revealed to the public and thus less information asymmetry exists about the firm's valuation. This could encourage target firms to accept stock offers. The result for our interaction variable *Underpricing*NUMA* confirms this evidence. Its coefficient is positive and statistically significant at the 1% (0.09, *t*-statistic = 3.18) over years 0-4. Thus, IPO firms with higher underpricing and followed by higher number of analysts are significantly more likely to conduct stock-financed acquisitions. Our results also show that the coefficient of *STDFOR* is negative and significant at the 1% level for year 0 (-2.80, *t*-statistic= - 2.82). This suggests that less agreement between analysts about IPO acquirer's valuation increases the degree of information asymmetry about the acquirer which could drive targets to refuse stock offers. Furthermore, Table 1.7 shows that the coefficient of the interaction variable

*Underpricing*STDFOR* is negative and significant for year 0 (-2.48, *t*-statistic= -2.52) and over years 0-4 (-4.31, *t*-statistic= -2.08) indicating that IPO firms with high degree of underpricing could not take advantage of their overvalued stocks to pay for stock acquisitions when there is a high extent of information asymmetry faced by the target when evaluating the acquirer, providing support for H3.

Our results also show that the total proceeds 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 year 4. This implies that IPO firms with higher proceeds are more likely to engage in cash-financed acquisitions, thereby supporting the capital infusion hypothesis of Celikyurt et al. (2010). Furthermore, we find that the coefficient of *Private* is positive and statistically significant indicating that IPO firms prefer to use stock for private targets (Chang, 1998). Controlling for the bubble period, we find that IPO firms are significantly more likely to use stocks to pay for acquisitions during internet bubble period.

Table 1.7 Logit regressions regarding the choice of payment method

	Year 0					Years 0-4				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Constant	-9.93**	-11.80**	-11.23**	-10.30*	-11.06**	-2.86**	-1.98	-3.34**	-2.28*	-1.65
	(-2.30)	(-2.11)	(-2.32)	(-1.89)	(-2.44)	(-2.07)	(-1.35)	(-2.43)	(-1.89)	(-1.05)
Underpricing	0.81**	0.83*	0.93**			0.36**	0.36**	0.16		
	(2.07)	(1.87)	(2.09)			(2.38)	(2.12)	(1.05)		
Proceeds	-0.65**	-0.87**	-0.29	-0.94**	-0.37	-0.13	-0.38**	-0.06	-0.21	-0.24
	(-2.01)	(-2.09)	(-0.90)	(-2.20)	(-1.09)	(-0.84)	(-2.32)	(-0.37)	(-1.46)	(-1.30)
Prestige	-0.09	-0.90	0.02	-0.80	0.14	0.43***	0.47***	0.42**	0.38***	0.40**
	(-0.17)	(-1.25)	(0.03)	(-1.19)	(0.23)	(3.03)	(3.09)	(2.24)	(2.60)	(2.03)
VC backed	0.53	0.82	0.74	0.79	0.92	0.50***	0.34*	0.59***	0.43***	0.44**
	(0.96)	(1.26)	(1.16)	(1.26)	(1.47)	(2.81)	(1.83)	(3.00)	(2.63)	(2.14)
Private	1.32**	1.34**	1.23**	1.37**	1.05*	0.62***	0.66***	0.68***	0.61***	0.72***
	(2.50)	(2.11)	(2.01)	(2.14)	(1.95)	(5.38)	(5.34)	(4.45)	(5.05)	(4.64)
Bubble	11.80***	14.51***	13.72***	14.49***	12.03***	1.88***	2.14***	2.41***	1.91***	2.56***
	(7.92)	(7.71)	(7.82)	(8.59)	(7.40)	(5.26)	(5.63)	(5.52)	(5.31)	(5.73)
Merger wave	0.49	0.16	0.45	0.30	0.84	0.50***	0.30**	0.40**	0.42***	0.49***
	(0.82)	(0.22)	(0.66)	(0.42)	(1.36)	(3.74)	(2.08)	(2.37)	(3.01)	(2.93)
SEO	-0.04	1.02*	-0.16	1.08*	0.04	-0.23	-0.06	-0.43**	-0.13	-0.43**
	(-0.09)	(1.81)	(-0.24)	(1.92)	(0.07)	(-1.56)	(-0.41)	(-2.23)	(-0.85)	(-2.19)
Relatedness	1.20**	1.04*	0.94*	0.98*	0.77	0.12	0.14	0.14	0.09	0.13
	(2.56)	(1.75)	(1.74)	(1.67)	(1.58)	(1.05)	(1.20)	(0.96)	(0.81)	(0.87)
NUMA		0.18					0.07***			
		(0.88)					(4.43)			
STDFOR			-2.80***					-0.96		
			(-2.82)					(-1.11)		
Underpricing*NUMA				0.15					0.09***	
				(1.41)					(3.18)	
Underpricing*STDFOR					-2.48**					-4.31**
					(-2.52)					(-2.08)
Invmills	-1.48	-1.32	-2.69	-1.73	-1.32	0.49	-0.00	0.50	0.16	-0.82
	(-0.96)	(-0.66)	(-1.45)	(-0.87)	(-0.77)	(0.51)	(-0.00)	(0.54)	(0.19)	(-0.75)
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	152	124	124	124	124	1,721	1,590	1,088	1,590	1,088
Pseudo R^2	0.20	0.25	0.27	0.23	0.21	0.10	0.12	0.12	0.11	0.13

Note: 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. *Underpricing* is the price run-up in the first trading day after the IPO. It is 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 logarithm of the total capital raised at the time of the IPO, taken as a measure of the IPO acquirer size. *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 variable taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *Private* takes on the value of 1 if the target is a privately held firm and 0 otherwise. *Bubble* is a dummy variable that takes the value of 1 if the IPO occurred during 1999-2000, and zero otherwise. Merger wave is a dummy variable taken the value of 1 if an M&A wave occurs in any of the five post-IPO years we consider, and zero otherwise. SEO is a dummy variable that takes the value of 1 if the IPO firm conducts a seasoned equity offerings during the first 5 years following the IPO, and zero otherwise. *Relatedness* is a dummy variable that takes the value of 1 if the acquirer and the target are in the same industry, and 0 otherwise. *NUMA* is the number of analysts following the acquirer. *STDFOR* is the standard deviation of analysts' earnings forecasts about the acquirer. We estimate the model using the Heckman procedure. The inverse Mills ratio (*Invmills*) is included in the table. Regressions include a constant term, industry 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.

We further investigate the role of cross-holdings in explaining the choice of payment method in acquisitions by IPO firms by running the following regression[11]:

$$Y_i = \beta_0 + \beta_1 Underpricing_i + \beta_2 Proceeds_i + \beta_3 Prestige_i + \beta_4 VC\ backed_i + \beta_5 Bubble_i + \beta_6 Merger\ wave_i + \beta_7 SEO_{it} + \beta_8 Relatedness_i + \beta_9 NUMA + \beta_{10} STDFOR + \beta_{11} NUMCRH_i + \beta_{12} BIEQOW_i + \beta_{13} TAREQOW_i + \beta_{14} LARBCR_i + \beta_{15} LARTCR_i + \beta_{16} COM_HOLD_i + \varepsilon_i \quad (5)$$

Table 1.8 presents estimation results for regression (5) where the dependent variable is one if the acquisition was by stock and zero if it was by cash. We use Heckman's (1979) method to correct for sample selectivity bias as we are interested only in IPO acquirers. We find that the probability of stock-financed acquisition is positively and statistically related to the number of cross-holdings at the 1% level. The coefficient of *NUMCRH* is positive and statistically significant at the 1% level (0.89, *t*-statistic= 2.76). This implies that the higher the number of institutional bidder shareholders that own shares in the target firm, the higher the probability of an IPO firm conducting a stock-financed acquisition. In Columns 2 and 3 of Table 1.8, we test whether the cross owner's proportion of shares held in the acquirer and the target firms influences the likelihood of conducting stock-financed acquisitions. We find that cross bidder ownership seems to be unrelated to the probability of stock acquisition. The

[11] We do not include the control variable private in eq. (6) as we do not have sufficient data on cross-holding shares for private M&A.

coefficient of *BIEQOW* is positive but not statistically significant (5.73, *t*-statistic= 1.01). However, there is a positive and significant relation between the proportion of shares held in the target and the likelihood to engage in stock acquisition. The coefficient of *TAREQOW* is positive and statistically significant at the 1% level (12.87, *t*-statistic= 2.86). This result suggests that institutional cross-shareholders who own a larger percentage of shares in the target prefer to receive shares rather than cash in a merger transaction to increase their ownership and obtain influence in the combined firm. Columns 4 and 5 of Table 1.8 show that having a large cross-owner in the acquirer's equity influences positively but not significantly the probability of choosing stock as a mode of payment. The coefficient of *LARBCR* is positive but not statistically significant (0.76, *t*-statistic= 1.21). However, there is a positive and significant relation between the existence of a large cross-owner in the target's equity and the likelihood of a stock-financed acquisition. The coefficient of *LARTCR* is positive and statistically significant at the 10% level (1.43, *t*-statistic= 1.91). These results indicate that IPO acquirers' institutional shareholders also having a large proportion of shares in the target firm would accept acquisition using overvalued stocks since they will be able to compensate their losses as IPO acquirer shareholders by potential gains from the target firm. Further, in model (6), when we consider the proportion of shares that are cross-held, we find that the coefficient of *COM_HOLD* is positive and statistically significant at the 10% level (5.03, *t*-statistic= 1.69). This result suggests that IPO firms where the common institutional shareholders ownership in the IPO acquirer and the target firm is high are more inclined to use stocks to pay for future acquisitions, confirming H4.

Table 1.8 Cross-holdings and payment method in post-IPO acquisitions

	Logit estimates					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	6.67	7.48	6.89	8.32	8.57	6.43
	(0.85)	(0.91)	(0.90)	(1.20)	(1.23)	(0.80)
Underpricing	0.49	0.64	0.51	0.61	0.36	0.62
	(0.92)	(1.16)	(1.06)	(1.04)	(0.74)	(1.23)
Proceeds	-1.70**	-1.55*	-1.60*	-1.52**	-1.41*	-1.53*
	(-2.06)	(-1.86)	(-1.82)	(-2.05)	(-1.88)	(-1.82)
Prestige	-0.76	-0.59	-0.75	-0.81	-0.99	-0.49
	(-0.65)	(-0.42)	(-0.69)	(-0.71)	(-0.88)	(-0.38)
VC backed	0.66	0.71	0.63	0.81	0.75	0.66
	(0.80)	(0.88)	(0.76)	(1.00)	(0.95)	(0.82)
Bubble	1.25	0.84	2.49	0.19	0.77	1.69
	(0.76)	(0.47)	(1.51)	(0.10)	(0.43)	(0.98)
Merger wave	3.41***	3.06***	2.87***	3.19***	2.89***	2.99***
	(3.40)	(3.19)	(2.96)	(3.14)	(3.10)	(3.19)
SEO	-0.60	-0.68	-0.63	-0.74	-0.66	-0.62
	(-1.13)	(-1.28)	(-1.15)	(-1.33)	(-1.20)	(-1.18)
Relatedness	0.61	0.94	0.85	0.98*	0.86	0.91
	(1.00)	(1.59)	(1.36)	(1.66)	(1.44)	(1.51)
NUMA	0.17*	0.12	0.18*	0.11	0.10	0.14*
	(1.68)	(1.54)	(1.73)	(1.51)	(1.26)	(1.69)
STDFOR	-1.70	-2.46	-4.85	-1.46	-2.57	-3.60
	(-0.48)	(-0.85)	(-1.21)	(-0.50)	(-0.90)	(-1.11)
NUMCRH	0.89***					
	(2.76)					
BIEQOW		5.73				
		(1.01)				
TAREQOW			12.87***			
			(2.86)			
LARBCR				0.76		
				(1.21)		
LARTCR					1.43*	
					(1.91)	
COM_HOLD						5.03*
						(1.69)
Invmills	-1.89	-2.08	-2.59	-1.98	-2.58	-2.13
	(-0.70)	(-0.79)	(-0.98)	(-0.84)	(-1.07)	(-0.81)
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	133	133	133	133	133	133
Pseudo R^2	0.36	0.33	0.42	0.31	0.33	0.38

Note: The dependent variable is equal to one for stock-financed acquisitions and zero for cash-financed acquisitions over the five years following IPO. *Underpricing* is the price run-up in the first trading day after the IPO. It is defined as the difference between the first day closing price and the offer price given as a percentage of the offer price. *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. *VC backed* is a dummy variable taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *Bubble* is a dummy variable that takes the value of 1 if the IPO occurred during 1999-2000, and zero otherwise. *Merger wave* is a dummy variable taken the value of 1 if an M&A wave occurs in any of the five post-IPO years we consider, and zero otherwise. *SEO* is a dummy variable that takes the value of 1 if the IPO firm conducts a seasoned equity offerings during the first 5 years following the IPO, and zero otherwise. *Relatedness* is a dummy variable that takes the value of 1 if the acquirer and the target are in the same industry, and 0 otherwise. *NUMA* is the number of analysts following the acquirer. *STDFOR* is the standard deviation of analysts' earnings forecasts about the acquirer. *NUMCRH* is the log of the number of institutional bidder shareholders that own shares in the target. *BIEQOW* is the percentage of shares held by bidder cross-owners at the end of the last quarter prior to the merger. *TAREQOW* is the percentage of shares held by target cross-owners at the end of the last quarter prior to the merger. *LARBCR* is a dummy taking the value of one if there is a blockholder (who owns more than 5% of 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. *COM_HOLD* is the percentage of the bidder and target firms's shares that are cross held. The regressions also include a constant term, industry and year dummies and the inverse Mills ratio (*Invmills*) from the Heckman estimation. For each independent variable, the first row reports its estimated coefficient and the second row, the corresponding robust *t*-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level respectively

1.5 Determinants of frequent acquisitions by IPO firms

Previous studies find that IPO firms tend to be frequent acquirers in the short period after the decision to go public. For instance, Celikyurt et al. (2010) note that 77% of firms conduct at least one acquisition within the first five years of the IPO, and the typical IPO firm makes four acquisitions in this five-year period. Hovakimian and Hutton (2010) show that many firms make more than one acquisition after the IPO, averaging slightly over two mergers per firm. 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 investigate the effect of IPO characteristics on the acquisition activity after the IPO. Hovakimian and Hutton (2010) consider that market valuations can drive both acquisition and IPO activities. 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 increases the likelihood of acquisitions, suggesting that market timing is a stronger factor in acquisitions. We expect that IPOs will exploit their first day underpricing to make frequent acquisitions in the short period after the IPO. Furthermore, IPOs followed by a prestigious underwriter would also be frequent acquirers. IPO literature demonstrates that high prestige underwriters with a good reputation and superior information about the issuing firm's prospects can credibly certify the value of the issues that they are underwriting (e.g. Chemmanur and Fulghieri, 1999). When choosing an underwriter, an IPO firm does not only consider whether the services are effective at the time of the IPO but also during the post-IPO period. In particular, the underwriter services would also be useful when the issuing firm considers making acquisitions following its IPO. Arikan and Capron (2010) argue that an acquisition advisor serving as lead underwriter could 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.

Following Billett and Qian (2008), we define a frequent acquirer as an IPO firm announcing at least two acquisitions within five years after the IPO. Based on this definition, our initial sample of 2,547 IPO acquirers includes 1,350 frequent acquirers making 4,583 acquisitions in the five years following the IPO. The remaining IPO firms (1,197) constitute our single acquirer sample.

Panel A of Table 1.9 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 a higher level of underpricing than single acquirers. The mean underpricing of single IPO acquirers is 24% whereas it is 32% for frequent IPO acquirers. This difference is significant at the 5% 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 1% level. The mean change in insider ownership of frequent IPO acquirers is 0.27 compared to that of single IPO acquirers of 0.21. This difference is significant at the 5% level.

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

$$Y_i = \beta_0 + \beta_1 Underpricing_i + \beta_2 Proceeds_i + \beta_3 Prestige_i + \beta_4 VC\ backed_i + \beta_5 Advisor_i + \beta_6 SEO_i + \beta_7 Bubble_i + \beta_8 Merger\ wave_i + \beta_9 CHINS_i + \varepsilon_i \quad (6)$$

The estimation results of regression (6) are reported in panel B of Table 1.9. We find that IPO firms with higher underpricing are significantly more likely to be frequent acquirers following IPO. This suggests that the level of underpricing determines the intensity of acquisition activity of an IPO firm following going public. Further, subsequent capital raised after IPO seems to be an important factor that influences the acquisition activity of IPOs following going public. Our results show that IPO firms that make SEOs are significantly more likely to be frequent acquirers. The coefficient of *SEO* is positive and statistically significant at the 1% level (0.59, *t*-statistic= 3.98). We also find a positive and significant coefficient for *CHINS* (1.15, *t*-statistic= 2.68) indicating that a higher decline in the post-IPO insider ownership leads to a higher probability that an IPO firm to engage in more than one acquisition. In model (2), when we replace *Prestige* by *Advisor*, the coefficient is positive and statistically significant at the 10% level (0.61, *t*-statistic= 1.85). Thus, IPO firms that retain their underwriter as acquisition advisor are significantly more likely to be frequent acquirers. Hence, the underwriter's expertise in M&As would help newly public firm to be active acquirer.

Table 1.9 IPO characteristics and the likelihood of frequent acquisitions by IPO firms

Panel A: Descriptive statistics and univariate tests

	Single IPO acquirers (N= 505)			Frequent IPO acquirers(N=356)			Mean	Median
	Mean	SD	Median	Mean	SD	Median	test	test
Underpricing	0.24	0.43	0.13	0.32	0.53	0.16	-0.07**	-0.03***
Proceeds	3.61	0.87	3.60	3.70	0.87	3.69	-0.09	-0.09*
Prestige	0.61	0.48	1	0.66	0.47	1	-0.05	0.00
VC backed	0.50	0.50	1	0.50	0.50	1	0.00	0.00
Advisor	0.22	0.41	0.00	0.38	0.48	0.00	-0.16***	0.00***
SEO	0.40	0.49	0.00	0.53	0.49	1	-0.13***	-1***
Bubble	0.16	0.37	0.00	0.17	0.38	0.00	-0.01	0.00
Merger wave	0.19	0.39	0.00	0.22	0.42	0.00	-0.03	0.00
CHINS	0.21	0.16	0.18	0.27	0.36	0.18	-0.06**	0.00

Panel B: IPO characteristics and the likelihood of frequent acquisitions by IPO firms

	Logit estimates			
	(1)		(2)	
	Coefficient	t-statistics	Coefficient	t-statistics
Constant	-1.84	-1.10	-0.24	-0.07
Underpricing	0.38*	1.78	0.50	1.05
Proceeds	0.10	0.63	0.16	0.47
Prestige	0.26	1.42		
VC backed	0.02	0.12	-0.38	-1.10
Advisor			0.61*	1.85
SEO	0.59***	3.98	0.30	1.00
Bubble	-0.37	-1.10	-0.61	-0.98
Merger wave	0.24	0.84	0.49	0.82
CHINS	1.15***	2.68	0.08	0.09
Invmills	0.66	0.47	0.38	0.13
Industry dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
Observations	835		253	
Pseudo R^2	0.04		0.08	

Note: Panel A presents summary statistics and univariate tests for the differences in means and medians for single and frequent IPO acquirers respectively. Panel B reports multiple regression results. *Underpricing* is the price run-up in the first trading day after the IPO; it is 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 variable taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *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. *SEO* is a dummy variable that takes the value of 1 if the IPO firm conducts a seasoned equity offerings during the first 5 years following the IPO, and zero otherwise. *Bubble* is a dummy variable that takes the value of 1 if the IPO occurred during 1999-2000, and zero otherwise. *Merger wave* is a dummy variable taken the value of 1 if an M&A wave occurs in any of the five post-IPO years we consider, and zero otherwise. *CHINS* is the absolute value of the difference between post-IPO and pre-IPO inside ownership. The results of the *t*-tests for the difference in means and non-parametric Wilcoxon rank-sum tests for the difference in medians are reported in parentheses. The regressions include a constant term, industry and year dummies and the inverse Mills ratio (*Invmills*) from the Heckman estimation. ***, **and * indicate significance at the 1%, 5% and 10% levels respectively.

1.6 Robustness tests

In this section, we rely on a survival analysis technique[12] to investigate both the likelihood of an acquisition by an IPO firm and its timing relative to its IPO. In other words, why some IPOs tend to engage in acquisition in the IPO year or one year after IPO while others conduct their first acquisition later? The model estimation is conducted with the partial likelihood method using the proportional hazards model proposed by Cox (1972)[13]. 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 $h_i(t)$ is defined as the probability of engaging in an acquisition during the five years following the IPO. $\lambda_0(t)$ is the baseline hazard function and the second part of the equation is the exponentiated set of covariates for firm *i*.

The regression model is as follows:

$$Y = \beta_0 + \beta_1 Underpricing + \beta_2 Proceeds + \beta_3 Prestige + \beta_4 VC\ backed + \beta_5 SEO + \beta_6 Bubble + \beta_7 Merger\ wave + \beta_8 CHINS + \varepsilon \quad (8)$$

Table 1.10 reports the survival analysis results for regression (8). We find that IPOs with higher underpricing are more likely to make an acquisition. More specifically, the likelihood of making an acquisition by firms with higher underpricing is more than 1.29 ($e^{0.26}$) times that of firms with lower level of underpricing. Our results show that VC-backed IPOs are significantly more likely to make acquisitions than non VC-backed IPOs. We also find a positive but insignificant relation between the change in insider ownership post-IPO and the likelihood and the timing of acquisition following going public. External factors such as

[12] We also consider a Poisson specification, where the dependent variable is the number of years an IPO firm takes to conduct its first acquisition during the 5 years following its IPO and our conclusions remain qualitatively unchanged.

[13] 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.

bubble period and period of high M&A activity also seem to influence positively but non significantly the likelihood and the timing of acquisitions by IPO firms.

Table 1.10 Survival analysis results

	Cox regression estimates
Underpricing	0.26***
	(5.06)
Proceeds	0.17***
	(4.83)
Prestige	0.14*
	(1.81)
VC backed	0.21***
	(3.56)
SEO	0.03
	(0.55)
Bubble	0.11
	(1.64)
Merger wave	0.23
	(1.27)
CHINS	0.03
	(0.26)
Industry dummy	Yes
Year dummy	Yes
Observations	2,357
Wald_test	7652
Log_likelihood	-9787

Note: *Underpricing* is the price run-up in the first trading day after the IPO; it is 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 variable taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *SEO* is a dummy variable that takes the value of 1 if the IPO firm conducts a seasoned equity offerings during the first 5 years following the IPO, and zero otherwise. *Bubble* is a dummy variable that takes the value of 1 if the IPO occurred during 1999-2000, and zero otherwise. *Merger wave* is a dummy variable taken the value of 1 if an M&A wave occurs in any of the five post-IPO years we consider, and zero otherwise. *CHINS* is the difference between post-IPO and pre-IPO inside ownership. The regressions also include industry and year dummies. For each independent variable, the first row reports its estimated coefficient and the second row, the corresponding robust *t*-statistic. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level respectively.

We further test the robustness of our results with regard to determinants of payment method in post-IPO acquisitions by running an ordered logit regression. The dependent variable takes on the following values: one for cash acquisitions, two for mixed acquisitions and three for stock acquisitions. The results presented in Table 1.11 show that the probability of stock-financed acquisitions increases with the degree of IPO underpricing. The coefficient of *Underpricing* is positive and significant at the 1% level (in models 1 and 2). Specifically, taken the model 1, we find that a one standard deviation increase in the IPO underpricing leads to about 5% increase in the likelihood of stock acquisitions, 1.72% increase in the likelihood of mixed acquisition and 6.64% decrease in the likelihood of cash acquisitions. Similarly, we find that issuing IPO during the bubble period increases the likelihood of post-IPO stock and mixed acquisitions by about 37% and 1.90% respectively and decreases the likelihood of cash acquisitions by about 38%. Our results also show that higher number of analysts leads to significantly higher probability of stock-financed acquisitions. Consistent with our prior findings, IPO firms are less likely to exploit their high level of underpricing to engage in stock-financed acquisitions when the extent of information asymmetry faced by the target when evaluating the acquirer is high. We find that one standard deviation increase in *Underpricing*STDFOR* leads to about 50% decrease in the likelihood of stock-financed acquisitions, about 18% decrease in mixed-financed acquisitions and about 70% increase in cash-financed acquisitions. This result is consistent with Chemmanur et al. (2009) who find that the probability of a cash acquisition (relative to that of a stock and mixed acquisition) is increasing with the standard deviation of analyst forecasts.

Table 1.11 Ordered logit regressions regarding the choice of payment method

	Ordered logit estimates				
	(1)	(2)	(3)	(4)	(5)
Underpricing	0.27***	0.30***	0.05		
	(3.82)	(3.69)	(0.35)		
Proceeds	-0.46***	-0.50***	-0.45**	-0.49***	-0.33*
	(-4.61)	(-4.92)	(-2.42)	(-4.77)	(-1.80)
Prestige	0.58***	0.58***	0.67***	0.60***	0.56***
	(4.86)	(4.60)	(2.76)	(4.88)	(2.95)
VC backed	0.26**	0.26**	0.55**	0.26**	0.78***
	(2.08)	(1.99)	(2.37)	(2.05)	(3.59)
Private	0.60***	0.60***	0.49**	0.59***	0.59***
	(5.28)	(5.22)	(2.46)	(5.18)	(3.36)
Bubble	1.71***	1.84***	2.18***	1.78***	2.22***
	(6.13)	(6.42)	(5.09)	(6.29)	(5.45)
Merger wave	0.21*	0.19	0.14	0.20	0.21
	(1.71)	(1.47)	(0.69)	(1.55)	(1.16)
SEO	-0.26**	-0.19	-0.04	-0.24*	-0.19
	(-2.11)	(-1.52)	(-0.18)	(-1.91)	(-0.98)
Relatedness	0.12	0.08	0.13	0.10	0.21
	(1.23)	(0.76)	(0.76)	(1.03)	(1.37)
NUMA		0.04**			
		(1.97)			
STDFOR			-2.14		
			(-0.76)		
Underpricing*NUMA				0.08***	
				(3.74)	
Underpricing*STDFOR					-2.98*
					(-1.86)
Invmills	-1.22***	-1.24***	-0.17	-1.25***	0.23
	(-2.73)	(-2.66)	(-0.19)	(-2.72)	(0.25)
Industry dummy	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes
Observations	1,804	1,734	663	1,734	663
Pseudo R^2	0.08	0.09	0.12	0.08	0.11

Note: The dependent variable is equal to one for cash-financed acquisitions, two for mixed-financed acquisitions and three for stock-financed acquisitions over 5 years following IPO. *Underpricing* is the price run-up in the first trading day after the IPO; it is 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 logarithm 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. *VC backed* is a dummy taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *Private* takes on the value of 1 if the target is a privately held firm and 0 otherwise. *Bubble* is a dummy variable that takes the value of 1 if the IPO occurred during 1999-2000, and zero otherwise. *Merger wave* is a dummy variable taken the value of 1 if an M&A wave occurs in any of the five post-IPO years we consider, and zero otherwise. *SEO* is a dummy variable that takes the value of 1 if the IPO firm conducts a seasoned equity offerings during the first 5 years following the IPO, and zero otherwise. *Relatedness* is a dummy variable that takes the value of 1 if the acquirer and the target are in the same industry and 0 otherwise. *NUMA* is the number of analysts following the acquirer. *STDFOR* is the standard deviation of analysts' earnings forecasts about the acquirer. We estimate the model using the Heckman procedure. The inverse Mills ratio (*Invmills*) is included in the table. Regressions include a constant term, industry 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

1.7 Conclusions

In this paper, we consider a sample of 6,705 IPOs that covers the period from January 1980 to December 2010, to investigate the acquisition motive for newly public firms. Our results can be summarized as follows. First, post-IPO insider ownership significantly influences the acquisition activity after the IPO. Our findings support the view that IPO firms with high change in insider ownership from pre to post-IPO period are more likely to engage in M&A activity. When we examine the role of VC-backed IPOs in explaining the likelihood of M&A events following IPOs, we find that VC-backed IPOs are more likely to conduct acquisitions than are non-VC-backed IPOs 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. We also find that conducting an SEO within the five years following the IPO increases the likelihood of an IPO firm to conduct acquisition

Second, our analysis of method of payment of acquisitions following IPO suggests that IPO underpricing has a significant effect in explaining stock-financed acquisitions. However, when we consider the extent of information asymmetry faced by the target when evaluating the IPO acquirer, we find that a higher level of information asymmetry decreases the likelihood of an IPO firm to conduct stock-financed acquisitions, suggesting that target firms may prefer cash offer if they don't know enough about acquirer's stock valuation. Furthermore, we find that high level of cross-holdings influence positively the likelihood of stock-financed acquisitions and that having larger ownership in the target firm encourage IPO acquirers to conduct stock-financed transactions.

Why some IPO firms engage in only one acquisition while some others carry out serial acquisitions over the few years following their IPO? To answer this question, we investigate the effect of IPO characteristics on the acquisition activity after the IPO and find that IPO firms with higher underpricing, higher change in insider ownership, IPOs where the underwriter acts as an acquisition advisor and IPO firms that make seasoned equity offerings are significantly more likely to be frequent acquirers. Overall, our findings contribute to our understanding of the motivation of going public. Our results confirm indeed that an IPO represents an opportunity for new issuers to become acquirers and even frequent acquirers.

REFERENCES

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

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

Arthurs, J.D., Busenitz, L.W., Hoskisson, R.E., Johnson, R.A., 2009. Signaling and initial public offerings: The use and impact of the lockup period. Journal of Business Venturing 24, 360-372.

Barry, C., Muscarella, C., Peavy, J.,Vetsuypens, M., 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., Stegemoller, M., 2008. Corporate governance structure and the value of acquisition activity. Journal of Corporate Finance 14, 550–566.

Bhushan, R., 1989. Firm characteristics and analyst following. Journal of Accounting and Economics 11, 255–274.

Billett, M. T., Qian, Y., 2008. Are overconfident CEOs born or made? Evidence of self-attribution bias from frequent acquirers. Management Science 54, 1037-1051.

Brau, J., Fawcett, S., 2006. Initial Public Offerings: An analysis of theory and practice. Journal of Finance 61, 399-436.

Brau, J. C., Couch, R.B., Sutton, N.K., 2012. The desire to acquire and IPO long-run underperformance. Journal of Financial and Quantitative Analysis 47, 493-510.

Brav, A., Gompers, P., 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., Gompers, P.A., 1999. Insider trading subsequent to Initial Public Offerings: Evidence from expirations of lock-up provisions. Working paper.

Chang, S., 1998. Takeovers of privately held targets, methods of payment, and bidder returns. Journal of Finance 53, 773–784.

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

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

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

Cox, D. R., 1972. Regression models and life tables. Journal of the Royal Statistical Society 34, 187-220.

Fangjian F., Leming, l., Micah S., O., 2013. Acquisitions driven by stock overvaluation: Are they good deals? Journal of Financial Economics 109, 24-39.

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

Gao, N., Jain, B., 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.

Gu, F., Lev, B., 2011. Overpriced shares, ill-advised acquisitions, and goodwill impairment. Accounting Review 86, 1995–2022.

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

Harford, J., Li, K., 2007. Decoupling CEO wealth and firm performance: the case of acquiring CEOs. Journal of Finance 62, 917–949.

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

Heckman, J., 1979. Sample selection bias as a specification error. Econometrica 47, 153–161.

Hongjun, Z., Xianjie, H., Lin, L., 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., Hutton, I., 2010. Merger-motivated IPOs. Financial Management 39, 1547–1573.

Hsieh, J., Lyandres, E., Zhdanov, A., 2011. A Theory of merger-driven IPOs. Journal of Financial and Quantitative Analysis 46, 1367–1405.

Jensen, M., Meckling, W., 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., Ivanov, V.I., Masulis, R.W., Singh, A.K., 2011. Venture capital reputation, post-IPO performance, and corporate governance. Journal of Financial and Quantitative Analysis 46, 1295-1333.

Loughran, T. Ritter R.J., 2004. Why has IPO underpricing changed over time? Financial Management 33(3), 5- 37.

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

Megginson, W., Weiss, K., 1991. Venture capitalist certification in Initial Public Offerings Journal of Finance 46, 879-903.

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

Pagano, M., Panetta, F., Zingales, L., 1998. Why do companies go public? An empirical analysis. Journal of Finance 53, 27-64.

Ragozzino, R., Reuer, J.J., 2007. Initial Public Offerings and the acquisition of newly public firms. Strategic Organization 5, 155-176.

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

Ritter, J. R., Gao, X., Zhu, Z., 2013. Where have all the IPOs gone? Forthcoming, Journal of Financial and Quantitative Analysis.

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

Roosenboom, P., Goot, T., 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.

Schultz, P.H., Zaman, M., 2001. Do the individuals closest to Internet firms believe they are overvalued? Journal of Financial Economics 59, 347-381.

Shleifer, A., Vishny, R., 2003. Stock market driven acquisitions. Journal of Financial Economics 70, 295–311.

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

CHAPITRE II

ARTICLE 2

DO POST-IPO ACQUISITIONS AFFECT IPO LONG-RUN PERFORMANCE? EVIDENCE FROM FREQUENT ACQUIRERS

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ABSTRACT

We examine whether making frequent acquisitions in the first year of the IPO affect the long-run performance of IPOs differently than do infrequent acquisitions. We find that frequent acquirers do indeed experience significantly poorer performance in the five years following the IPO regardless of the benchmark used. For example, the cumulative abnormal returns for 1 through 4 years based on industry, size, and book-to-market ratio matching method are -20.07% for frequent acquirers as compared to -6.22% for infrequent acquirers. Further, we find that being a frequent acquirer in the first year after going public increases the probability of not surviving.

JEL classification: G32, G34
Keywords: initial public offerings; acquisitions; mergers; performance

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2.1 Introduction

Why do initial public offerings (IPOs) underperform in the long run? Several arguments have been proposed in the literature to elucidate this puzzling result, including the divergence of opinion hypothesis (Miller, 1977), the "impresario" hypothesis (Aggarwal and Rivoli, 1990), and the "windows of opportunity" hypothesis (Ritter, 1991 and Loughran and Ritter, 1995). Various authors also find that there are cross-sectional patterns related to IPO characteristics. For exemples, Brav and Gompers (1997) show that venture-backed IPOs outperform non-venture-backed IPOs in the five years following the IPO. Cao, Jiang, and Ritter (2013) report that this IPO pattern is reversed from 1999-2006.

Dong et al. (2011) find a positive relation between the quality of underwriters and the long-run performance of newly public firms. Examining the relation between insider trading and long-run post-IPO performance, Kuntara et al. (2007) find that IPOs with high block sales underperform IPOs with low block sales from the lockup expiration until the third year after the issue. Hsuan-Chi et al. (2012) examine the long-run stock performance of IPO firms following lockup expiration and find that IPO firms with insider selling and IPO firms with abnormal net sales by top executives within 126 trading days after the lockup expiration also exhibit poor long-run performance. Billet et al. (2011) find that firms that do multiple external financings after the IPO subsequently underperform.

Recently, corporate decisions after IPOs, such as M&As, have received the attention of many researchers. Celikyurt et al. (2010) explore the acquisition motive for IPOs and find that 77% of firms conduct at least one acquisition within the first five years of the IPO and that the typical IPO firm makes four acquisitions in this five-year period. Hovakimian et al. (2010) find that 36% of IPOs complete at least one acquisition in the three years following the IPO and that, on average, an IPO firm makes two mergers within the same time period. 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 these results, a new question could be raised about the impact of acquisition activity on the long run performance of IPOs. To the best of our

knowledge, Brau et al. (2012) provide the first study that addresses this question. Examining whether the acquisition behavior of IPO firms helps to explain the long-run negative IPO performance anomaly, they find that newly public firms that acquire within the first year after going public experience significantly poorer long-run performance after the first year than IPO firms that do not acquire in the first year.

In this paper, we reexamine the acquisition activity effect on the long-run performance of newly public firms. We contribute to the existing literature in several ways. Brau et al. (2012) have attempted to test whether newly public firms that acquire within the first year after going public underperform differently from IPO firms that do not acquire in the first year. We extend their work by distinguishing between IPOs making only one acquisition one year after going public and IPOs making multiple acquisitions within the same period. An examination of our IPO sample reveals that while some IPOs do not conduct any acquisition during the first-year of the IPO, others engage in as many as 14 acquisitions within the same period. In other words, first year frequent acquisitions are not rare events.

Based on previous findings that acquirers' performances vary from deal to deal in acquisition programs (see Ismail, 2008, Billett and Qian, 2008, and Aktas et al., 2009, 2011 and 2013, amongst others), we examine whether the long-run performance of an IPO firm that frequently acquires in the first year after going public differs from the long-run performance of an IPO firm that does not frequently acquire in the same period.

In doing so, we pay considerable attention to the methodological issues related to the calculation of abnormal returns First, to measure long-run abnormal stock returns of IPO firms, previous studies usually match IPO firms to control firms on the basis of firm characteristics, in particular size and book-to-market (BM) ratio. Bessembinder and Zhang (2013) show that IPO firms differ significantly from their size- and book-to-market matched counterparts in terms of other firm characteristics, such as idiosyncratic volatility, illiquidity, market beta, and return momentum. They find that allowing for differences between IPO and control firms in these additional firm characteristics substantially explains the apparent abnormal returns of IPO firms. In this study, we implement propensity score matching (PSM) based on Rosenbaum and Rubin's (1983) propensity score theorem. This technique makes it

possible to simultaneously match as many firm dimensions as needed, thereby helping to produce accurate matches and to eliminate possible sources of bias due to differences between IPO and control firms

Second, another important empirical issue is related to overlapping observations. Mitchell and Stafford (2000) argue that ignoring cross-sectional correlation in abnormal returns induced by overlapping observations will produce overstated test statistics and will lead to serious misspecification. In our case, an overlapping problem occurs when the sample includes some frequent acquirers that have acquired more than one target within the period of the event under investigation. This implies that stock returns are affected by multiple takeover events, and consequently bias the financial performance calculation. Antoniou et al. (2004) find that the average three-year buy-and-hold abnormal returns of all acquiring firms are higher than those of non-overlapping firms (i.e., firms making one acquisition in three years). They suggest that the higher average abnormal returns of the overall sample are inflated by the high positive abnormal returns of the overlapping firms. Further, Loughran and Vijh (1997) and Wiggenhorn et al. (2007) propose considering only the first acquisition when the IPO firm makes more than one, removing all subsequent acquisitions from the sample. However, ignoring the effect of subsequent acquisitions on the long-term abnormal return calculation could bias the results. Third, to examine whether acquisition order helps to understand the long-run performance of frequent IPO acquirers, we divide the first-year abnormal returns of IPO acquirers into returns before the first acquisition, returns between the first and second acquisition, and returns after the second acquisition for frequent acquirers.

Fourth, to complement our long-run performance analysis, we focus on the survival profile of IPO firms that make acquisitions in the first year after going public. The question addressed at this point is whether the post IPO survival time is influenced by the number of acquisitions made by IPO firms in the first year after going public.

Using a sample of 5,055 U.S. IPOs from 1980 through 2006, we find that newly public firms that make frequent acquisitions within the first year after going public show significantly poorer long-run performance after the first year than do IPO firms making only one acquisition in the first year. The mean differences between the two subgroups are

statistically significant for the 2 to 5 years following the IPO and across all benchmarks used. These findings suggest that, while making an acquisition in the first year of the IPO is a potential driver for the long-run underperformance of IPO firms, frequent acquisitions in the same period worsens this long-run behavior.

Additionally, our results indicate that IPO firms that make acquisitions in the first year after going public and that continue to be active acquirers in the subsequent 4 years show better long-run performance than do IPOs making acquisitions only the first year after going public. We also find that the underperformance of IPO frequent acquirers occurs after the second acquisition, suggesting the importance of deal order in examining the negative long-run performance of IPOs making frequent acquisitions in the first year after going public. Our results also indicate that frequent IPO acquirers are less likely to survive in the five years following the IPO than are single IPO acquirers. Additionally, we find that the higher the number of acquisitions made by IPO firms in the first year after going public, the lower the survival duration. Our findings also show that the acquisition behavior of IPO firms has a distinct impact on the delisting procedure. Specifically, we find that being a frequent IPO acquirer significantly decreases the survival duration when we compare survivors to IPOs delisted for negative reasons.

The remainder of the paper is organized as follows: Section 2 presents the literature review. In section 3, we describe the data and methodology. Section 4 presents the performance results and the survival analysis, and section 5 concludes.

2.2 Literature review

The long-run performance of newly public firms remains a puzzling issue. Since Ritter's (1991) results highlighting the underperformance of IPOs in the long run, many researchers have attempted to explain this phenomenon. For instance, Brav and Gompers (1997) investigate the after-market performance of a sample of 934 venture-backed IPOs and 3,407 non-venture-backed IPOs during the 1972-1992 period. They find that venture-backed IPOs outperform non-venture-backed IPOs using equally weighted returns. However, the level of underperformance as well as the differences between the two IPO groups are reduced using

value weighted returns. Further, using various benchmarks and the Fama and French (1993) three-factor model, they find that venture-backed IPOs do not significantly underperform, while the smallest non-venture-backed companies do. In the same vein, Krishnan et al. (2011) investigate the relation between several alternative venture capital reputation measures and subsequent IPO issuer performance. They find that VC reputation, measured by the past market share of VC-backed IPOs, positively affects and the long-run performance of IPOs.

Carter et al. (1998) examine the long-run performance of 2,292 IPOs. They find that the underperformance of IPO stocks relative to the market over a three-year holding period is less severe for IPOs handled by more prestigious underwriters. More recently, Dong et al. (2011) analyze the relation between the quality of the underwriter and the long-run performance of 6,622 "non-bubble" IPOs and 785 Internet bubble IPOs. Their results show that the number of managing underwriters and the underwriter rating positively affect the long-run performance. They also find that underwriters had a different impact on the long-run performance during the bubble period when compared to the non-bubble period.

Other explanations of the long-run underperformance of firms going public are advanced in the IPO literature. Teoh et al. (1998) examine a sample of 1,649 IPO firms during the period 1980-1984. They conclude that issuers with higher discretionary accruals, which is a proxy for earnings management, have poorer stock return performance in the subsequent three years. Using different test specifications, including event time cross-sectional regressions and a calendar time series approach, they find that issuers with unusually high accruals in the IPO year experience poor stock return performance in the subsequent three years. Kuntara et al. (2007) examine the relation between block sales and long-run performance following the IPO. Testing a sample of 3,087 IPOs during the 1993-2000 period, they find that from 20 days after the IPO to the lockup expiration date, IPOs with high block sales outperform IPOs with low block sales. However, an underperformance of high block sales compared to low block sales is observed from the lockup expiration until the third year after issue. Hsuan-Chi et al. (2012) analyse the relation between insider trading activity following lockup expiration and the long-run performance of IPO firms. Using a sample of 2,269 IPO firms from 1988 to 2003, they find that IPO firms with insider selling and IPO

firms with abnormal net sales by top executives within 126 trading days after the lockup expiration underperform in the three-year period following the initial offerings.

Another literature strand highlights the relation between post-IPO acquisition activity and the long-run performance of newly public firms. This potential explanation stems from the fact that numerous studies argue that IPO firms tend to be active acquirers in the post-IPO period. Brau and Fawcett (2006) survey 336 CFOs and show that the creation of public shares for acquisitions and the establishment of the market price or value of the firm represent the two most important reasons for going public. They find that 59% of CFO respondents agree with this statement. Brau et al. (2003) thus argue 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. Celikyurt et al. (2010) analyze the post-IPO acquisition activity of 1295 US IPOs issued between 1985 and 2004. They find that 77% of firms conduct at least one acquisition within the first five years of the IPO and that the typical IPO firm makes four acquisitions during this five-year period. Furthermore, Hovakimian et al. (2010) examine the sample of 2,059 IPO firms conducting 4,265 mergers between 1980 and 2006 and find that 36% of IPOs complete at least one acquisition in the three years following the IPO and that, on average, an IPO firm makes two mergers within the same time period.

Brau et al. (2012) is the first study that analyzes the relation between acquisition activity and the long-run stock performance of IPO firms. Using a sample of 3,547 IPOs, of which 1,181 are involved in M&A activity within the first year after the IPO, they find that the acquisition activity of IPOs is a contributing factor in explaining the long-run underperformance of IPO firms. Their results show that the mean 3-year buy-and-hold abnormal returns for IPOs that acquire within the first year after going public is -15.6% compared to 5.9% for non-acquirers for the same period. The long-run underperformance of IPO first-year acquirers is also confirmed using calendar-time factor model regressions. Furthermore, they find that making an acquisition within the first year lowers the abnormal returns by almost 30% over years 2-4 after going public, based on the market-adjusted return. In this paper, we contribute to the existing literature by distinguishing between IPOs making only one acquisition one year after going public and IPOs making multiple acquisitions within the same period. Our rationale is that frequent acquisitions perform differently in the

long run than single acquisitions. For instance, Ismail (2008) considers a sample of 16,221 US takeovers between 1985 and 2004 to examine whether takeovers by multiple acquirers are perceived differently by the market than those by single acquirers. He finds that single acquirers out-perform indeed multiple acquirers by 1.66%. Billett and Qian (2008) examine acquirer abnormal returns at the announcement of an acquisition and find that frequent acquirers underperform in the short run compared to infrequent acquirers. These authors retain the hubris, developed from past acquisitions, as a plausible explanation to value-destructive deals. Aktas et al. (2011) examine the CEO bidding behavior in sequences of two successive M&A deals and confirm the learning hypothesis. Specifically, they find (p. 19) that "*CEOs appear to acknowledge the signals that investors send and dynamically adjust their bidding from deal to deal*".

2.3 Data and Methodology

We identify initial public offerings by U.S. firms from 1980 to 2006 using Thomson Financial's SDC New Issues database. We exclude ADRs, unit offerings, and IPOs with an offer price of less than $5. We also exclude financial firms (two-digit SIC 60) and utility (two-digit SIC 49) firms from the IPO sample. To require price data, we use databases from the Center for Research in Security Prices (CRSP) and Compustat. We retain a sample of 5,055 IPOs after applying these filters. We use the SDC Merger and Acquisitions database to determine whether their IPOs become acquirers in the 5 years following the IPO. Our final sample comprises 2,471 IPOs that make acquisitions within 5 years of the IPO and 2,584 IPOs that did not make any acquisition within the same period. Following Brau et al. (2012), we define first-year-acquirer IPO firms with a merger effective date that occurs before the first anniversary of the IPO. Of the 2,471 IPO acquirers, 968 of them (39.17%) take part in acquisition activity within the first year of the IPO. Classifying first-year acquirers into frequent and single acquirers, our sample contains 303 IPOs making more than 2 acquisitions within the first year after going public (frequent acquirers) and 665 IPOs making only one acquisition within the same period (single acquirers). The number of acquisitions made by frequent acquirers varies between 2 and 14 acquisitions (the highest number of acquisitions is

observed in years 1996 and 1998). The mean number of acquisitions made by frequent acquirers varies from 2 to 3.5 acquisitions.

Table 2.1 reports descriptive statistics for the sample. The number of IPOs in our sample varies over time. Higher levels are especially observed in 1996 and during the Internet bubble (1999-2000). The number and percentage of IPOs making acquisitions within the first year after going public follow a trend that especially increases from 1991 to 1999 (38.67% in 1999 compared to 13.60% in 1991). An analysis of frequent acquisitions by first-year IPO acquirers reveals a similar pattern, with frequent IPO acquirers increasing from 8 in 1991 to 65 in 1999. Our industry distribution (see Table 2.2) shows that most of the IPOs in the sample are in manufacturing and service industries. We also observe that IPOs in communications, sanitary services and services are more likely to make acquisitions in the first year after the IPO, with the highest level of frequent IPO acquirers observed in communication industries.

Table 2.1 Frequency Distribution by IPO Year

IPO year	Frequency	% of total sample	Number of 1st-Year IPO acquirers	% of 1st-Year IPO acquirers	Number of 1st-Year frequent IPO acquirers	% of 1st-Year frequent IPO acquirers	Mean number of acquisition by first year frequent IPO acquirers
1980	7	0.14	1	14.29	0	-	
1981	24	0.47	4	16.67	0	-	
1982	12	0.24	3	25.00	0	-	
1983	49	0.97	14	28.57	0	-	
1984	25	0.49	7	28.00	0	-	
1985	34	0.67	1	2.94	0	-	
1986	240	4.75	9	3.75	1	11.11	3
1987	203	4.02	8	3.94	1	12.50	3
1988	79	1.56	4	5.06	1	25	2
1989	86	1.70	7	8.14	2	28.57	2.5
1990	89	1.76	13	14.61	1	7.69	2
1991	228	4.51	31	13.60	8	25.81	2.5
1992	337	6.67	53	15.73	9	16.98	2.55
1993	427	8.45	80	18.74	19	23.75	2.31
1994	374	7.40	58	15.51	21	36.21	2.71
1995	399	7.89	80	20.05	27	33.75	2.85
1996	601	11.89	129	21.46	41	31.78	3
1997	385	7.62	105	27.27	34	32.38	2.61
1998	219	4.33	68	31.05	32	47.06	3
1999	375	7.42	145	38.67	65	44.83	2.73
2000	307	6.07	64	20.85	21	32.81	2.43
2001	65	1.29	12	18.46	2	16.67	3
2002	57	1.13	8	14.04	2	25.00	2
2003	44	0.87	8	18.18	5	62.50	2.4
2004	147	2.91	17	11.56	4	23.53	2.25
2005	123	2.43	27	21.95	5	18.52	3.2
2006	119	2.35	12	10.08	2	16.67	3.5
Total	5055	100	968	100	303		

Table 2.2 Industry distribution

Industry	2-Digit SIC	Number of IPOs	% of IPOs	Number of first year IPO acquirers	% of first year IPO acquirers	Number of first year frequent acquirers	% of first year frequent acquirers
Agriculture	01 -09	2	0.04	0	-	0	-
Natural resource	10-14	77	1.52	2	2.60	0	-
Construction	15-17	46	0.91	8	17.39	2	25.00
Manufacturing	20-39	2273	44.97	287	12.63	55	19.16
Transportation, communication and sanitary services	40-49	371	7.34	85	22.91	40	47.06
wholesale+retail trade	50-59	592	11.71	114	19.26	31	28.07
Finance, insurance and real state	60-67	90	1.78	10	11.11	3	30.00
Services	70-89	1604	31.73	462	28.80	172	37.45
Total		5055		968		303	

To calculate the long-run performance of IPO firms, we use two approaches. First, as an event time approach, we consider the standard cumulative abnormal return (CAR) measure. Our choice of CAR rather than the buy and hold abnormal return (BHAR) is based on the results of prior studies. Fama (1998) and Mitchell and Stafford (2000) argue that abnormal performance measures, such as cumulative abnormal returns (CARs) and time-series regressions, are less likely to yield spurious rejections of market efficiency compared to methods that use buy and hold returns. The latter is due to the fact that the nature of compounding single period returns at the monthly frequency could magnify underperformance. Brav et al. (2000) also point out that buy and hold returns tend to over-estimate the long-run underperformance. Second, as a calendar time approach, we use the alphas from the Fama and French (FF) three-factor model.

We calculate mean cumulative abnormal returns (MCAR) based on three benchmarks: (i) the value-weighted CRSP index; (ii) a sample of firms matched by industry, size, and book-to-market ratio; and (iii) a sample of firms matched using PSM. In order to select matching firms based on industry, size, and book-to-market ratio, we first create a sample of possible matching firms listed on CRSP and having at least 5 years data without any stock issues

within 5 years. Second, we identify all firms within the same industry (2-Digit SIC) as the IPO sample. Third, following Lyon et al. (1999), we choose all firms with market capitalization between 70% and 130% of the IPO firms at the end of the fiscal year in which the IPO takes place. Finally, from this subset, we choose the firm with the book-to-market ratio closest to that of the IPO firm. Further, to obtain control firms that are as similar as possible to IPO firms, we consider the propensity score technique. The outcome of this method is the conditional probability, called the propensity score of being in the treated group (in our case IPO decision) given the observed variables. We estimate the propensity score as follows: let $Y_{i,t}$ be an event indicator that is equal to 1 for IPO firms and 0 for non-IPO firms. Let $X_{i,t}$ be a vector of independent variables (firm characteristics) observed for firm i (IPOs as well as non-IPO firms) in fiscal year t (the IPO year). A propensity score logit function is defined as $P_{i,t} = (Y_{i,t} = 1/ X_{i,t})$ for each fiscal year (t takes a value from 1980 to 2006). We use the "nearest neighbor" matching method which allows us to match each IPO firm to a single control firm with the closest propensity score ($P_{i,t}$ $value$). Specifically, we use six firm characteristics as conditioning variables to estimate the propensity score: idiosyncratic volatility, illiquidity, momentum, market beta, size, and book-to-market ratio. Following Bessembinder and Zhang (2013), we measure idiosyncratic volatility as the annualized standard deviation of the residuals in monthly regressions of daily stock returns on the three Fama and French (1993) factors over the 12 months after the IPO. A measure of illiquidity is constructed using the Amihud (2002) method. For each stock and for each of the 12 months after the IPO, we measure illiquidity as the average of the daily ratio of absolute stock return to the dollar trading volume. Market beta is estimated for each firm and for each of the 12 months after the IPO by implementing the market model in daily stock returns. All these estimates are averaged across 12 months. Return momentum is computed as the cumulative return from month 1 to month 11 after the IPO. Firm size is defined as the market capitalization at the fiscal year-end following the IPO. Book-to-market ratio is measured as the book value of equity over the market value of equity at the end of the fiscal year of the IPO event.

2.4 Empirical results

In this section, we first discuss univariate tests to determine if there are any differences in abnormal returns between IPOs making acquisitions in the first year of the IPO and IPOs not making acquisitions within the same period, and between IPOs making frequent acquisitions in the first year after going public and IPOs making only one acquisition within the same period. Second, we run a multivariate regression to test whether acquisition activity in the first year of the IPO affects the long-run performance of newly public firms, controlling for other factors that could influence the IPOs' long-run performance.

2.4.1 Univariate results

2.4.1.1 Event time approach

We focus on IPO long-run performance starting at month 13 after the IPO date. Indeed, when we consider the first-year window, we allow returns before the acquisition to be included in the abnormal returns calculation, which could bias the results. Thus, cumulative abnormal returns (CARs) are calculated for 2, 3, 4, and 5 years after the IPO as (13-24), (13-36), (13-48), and (13-60) months after going public. CAR from month q to month s is defined as:

$$CAR_{q,s} = \sum_{t=q}^{s} AR_t \quad (1) \qquad where\ AR_t = \frac{1}{n_t}\sum_{i=1}^{n_t} AR_{i,t} \quad (2)$$

$$\text{and } AR_{i,t} = R_{i,t} - R_{b,t} \quad (3)$$

$AR_{i,t}$ is the monthly abnormal return for firm i during the month t. $R_{i,t}$ is the return of the firm i during the month t and $R_{b,t}$ is the return on the benchmark during the corresponding time period. A month is defined as successive 21-trading-day periods. CARs are computed using the three previously- discussed benchmarks: CRSP value-weighted index; control firms matched by industry, size, and book-to-market; and control firms matched using the *PSM* method.

Table 2.3 presents CAR results. Panel A shows that IPOs underperform in the long run for almost all horizons, regardless of the benchmark used. In Panel B and C of Table 2.3, we compare the long-run performance between IPO first-year acquirers and non-acquirers. We find that excluding the first year from CAR calculation when using *PSM*, IPO acquirers underperform IPO non-acquirers by 10.51%, 16.47%, 10.58%, and 10.24% in years 2, 3, 4, and 5 following the IPO, respectively. This underperformance is statistically significant for all horizons regardless of the benchmark used. Our findings are thus in line with Brau et al. (2012) who argue that acquisition activity is one of the factors that could explain the long-run underperformance of IPO firms.

Table 2.3 Cumulative abnormal returns excluding the first year

	$CAR_{1,2}$			$CAR_{1,3}$			$CAR_{1,4}$			$CAR_{1,5}$		
	Market-adj	Ind-Size-BM	*PSM*	Market- adj	Ind-Size-BM	*PSM*	Market-adj	Ind-Size-BM	*PSM*	Market-adj	Ind-Size-BM	*PSM*
Panel A: All sample												
N	5055	5045	2416	5055	5045	2416	5055	5045	2416	5055	5055	2416
Mean (%)	-7.37	-4.33	-5.66	-4.78	-2.39	-3.76	2.62	-1.15	-1.44	6.58	-1.44	-2.05
Cluster adj P value	<.0001	<.0001	<.0001	0.0007	0.0094	0.0090	0.0656	0.1765	0.2198	0.0003	0.1520	0.1648
Panel B : Acquirers												
N	968	965	508	968	965	508	968	965	508	968	965	508
Mean (%)	-17.79	-9.31	-13.96	-18.53	-10.50	-16.76	-9.66	-10.08	-9.79	-6.29	-11.07	-10.14
Cluster adj P value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0087	0.0001	0.0131	0.0702	0.0002	0.0189
Panel C : Non-acquirers												
N	4087	4080	1908	4087	4080	1908	4087	4080	1908	4087	4080	1908
Mean	-4.89	-3.15	-3.45	-1.51	-0.48	-0.29	5.54	0.96	0.79	9.64	0.84	0.10
Cluster adj P value	<.0001	<.0001	0.0011	0.1807	0.3364	0.4327	0.0019	0.2438	0.3493	<.0001	0.2971	0.4826
Panel D : Difference tests Acquirers vs Non-acquirers												
T tests	-0.13 (- 4.94)	-0.06 (-3.74)	-0.10 (-4.10)	-0.17 (-4.48)	-0.10 (-3.88)	-0.16 (-4.24)	-0.15 (-3.45)	-0.11 (-3.51)	-0.10 (-2.32)	-0.15 (-3.31)	-0.11 (-3.34)	-0.10 (-1.98)

Note: Table 2.3 presents the mean cumulative abnormal returns from 2 through 5 years following going public (excluding the first year after IPO). For example, $CAR_{1,2}$ is the mean cumulative abnormal return from month13 to month 24 following IPO. The benchmark returns are either the CRSP value-weighted index (Market-adj), matched firms based on industry, size and Book-to-Market ratio (Ind-Size-BM) or matched firms based on the Propensity Score Matching (*PSM*). Panel A reports the mean abnormal return for all IPO firms. Panel B reports mean abnormal return for IPO that acquire within the first year following going public and panel C reports the mean abnormal return for IPO firms not making any acquisition within the first year of IPO. The number of observation varies across matching method due to data availability. The cluster adjusted P values account for year and industry effects. T statistics for difference in means test are given in Panel D.

In this study, we go beyond this conclusion by testing whether being frequent acquirers in the first year after going public affects the long-run performance of IPO firms differently than does making a single acquisition (an infrequent acquirer). Table 2.4 reports abnormal return results for frequent and infrequent IPO first-year acquirers for 2, 3, 4, and 5 years following the IPO and excluding the first year. A comparison between Panel A (frequent acquirers) and Panel B (infrequent acquirers) allows us to conclude that abnormal returns for first-year frequent acquirers are significantly lower than abnormal returns for infrequent first-year acquirers in all horizons and regardless of the benchmark used. Specifically, we find that frequent first-year acquirers underperform infrequent acquirers by more than 3 times. For example, $CAR_{1,4}$ based on industry, size, and book to-market ratio matching is -20.07% for frequent acquirers while it is - 6.22% for infrequent acquirers. We find a larger difference between $CAR_{1,5}$ based on *PSM* for frequent acquirers (-20.59%) and infrequent acquirers (-3.99%). The mean differences between the two subgroups are statistically significant for the 2 to 5 years following the IPO and across all benchmarks used. These findings suggest that, while making an acquisition in the first year of the IPO is a potential driver that explains the long-run underperformance of IPO firms, frequent acquisitions in the same period worsens this long-run behavior.

Table 2.4 Cumulative abnormal returns for first year frequent and non-frequent IPO acquirers

	$CAR_{1,2}$			$CAR_{1,3}$			$CAR_{1,4}$			$CAR_{1,5}$		
	Market-adj	Ind-Size-BM	*PSM*	Market-adj	Ind-Size-BM	*PSM*	Market-adj	Ind-Size-BM	*PSM*	Market-adj	Ind-Size-BM	*PSM*
Panel A: Frequent acquirers												
N	303	303	176	303	303	176	303	303	176	303	303	176
Mean	-30.57	-18.24	-20.99	-35.93	-21.39	-32.28	-26.23	-20.07	-24.20	-17.60	-20.16	-20.59
Cluster adj P-value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.0003	0.0091	0.0002	0.0059
Panel B : Non-frequent acquirers												
N	662	660	332	662	660	332	662	660	332	662	660	332
Mean	-11.73	-5.05	-9.86	-10.54	-5.67	-8.15	-2.71	-6.22	-2.31	-1.29	-7.50	-3.99
Cluster adj P-value	<.0001	0.0037	0.0010	0.0081	0.0236	0.0478	0.2944	0.0268	0.3390	0.4020	0.0201	0.2522
Panel C : Difference in means test												
T tests	-0.18 (-3.41)	-0.13 (-3.93)	-0.11 (-2.03)	-0.25 (-3.31)	-0.16 (-3.12)	-0.24 (-3.01)	-0.23 (-2.68)	-0.14 (-2.37)	-0.22 (-2.38)	-0.16 (-1.77)	-0.13 (-1.91)	-0.16 (-1.64)

Note: Table 2.4 presents the mean cumulative abnormal returns from 2 through 5 years following IPO (excluding the first year after IPO) for frequent and non-frequent acquirers. Panel A and B provide mean abnormal returns for first year frequent and non-frequent acquirers, respectively. The benchmark returns are either the CRSP value-weighted index (Market-adj), matched firms based on Industry, Size and Book-to-Market ratio (Ind-Size-BM) or matched firms based on the Propensity Score Matching (*PSM*). The number of observation varies across matching method due to data availability. The cluster adjusted P values account for year and industry effects. T statistics for difference in means test are given in Panel C.

2.4.1.2 Calendar time approach

In this section, we employ the Fama and French (1993) three-factor model to estimate the long-run performance of IPOs. For each calendar month, we calculate the return on a portfolio composed of IPO firms that carry out an IPO between 13 and 48 months prior to the current month and engage in M&A activity within the first 12 months of going public. To determine the return on a portfolio, we use value-weighted average returns. The calendar-time returns on this portfolio are used to estimate the following regression:

$$R_{pt} - R_{ft} = \alpha_p + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_t \quad (4)$$

Where R_{pt} is the monthly return on a value-weighted calendar-time portfolio of IPOs, R_{ft} is the monthly return on treasury bills, R_{mt} is the return on a value-weighted market index, SMB_t is the difference, each month, between the returns of a value-weighted portfolio of small and big stocks, and HML_t is the difference, each month, between the returns of a value-weighted portfolio of high book-to-market stocks and low book-to-market stocks. α_p is the intercept term and represents the mean monthly excess return on the calendar-time portfolio. We estimate this model for all IPO firms, first-year IPO acquirers and non-acquirers, and first-year frequent and infrequent IPO acquirers.

As shown in Panel A of Table 2.5, the mean monthly calendar-time abnormal returns for all IPO firms is - 0.12%, suggesting that IPO firms underperform in the long run; this result is not however statistically significant. Panel B and C show that first-year IPO acquirers have mean monthly abnormal returns of -0.69%, which is significant at the 5% level, whereas the non-acquirer group presents a positive but not statistically significant mean monthly abnormal return of 0.03%. Consistent with Brau et al. (2012), our results confirm that being an acquirer in the first year after going public negatively affects the long-run performance of IPO firms. We also estimate regression (4) for frequent and infrequent first-year acquirers. The results reported in Panel D and E of Table 2.5 show that IPO firms that frequently acquire in the first year after going public have mean monthly abnormal returns of -0.56%

(significant at the 10% level). In line with our event time results, frequent IPO first-year acquirers seem to have lower long-run performance than do infrequent acquirers.

Table 2.5 Calendar time factor model regressions

	Factors				Model characteristics	
	Alpha	RMRF	SMB	HML	Adjusted R-squared	F-stat
Panel A: Value weighted calendar-time portfolio (all sample) N = 4986						
Estimate	-0.0012	1.3022	1.0721	-0.2875	82.62%	561.83***
t-statistics	-0.62	25.97***	9.96***	-3.39***		
Panel B: Value weighted calendar-time portfolio (acquirers) N = 952						
Estimate	-0.0069	1.3380	1.0398	-0.2717	65.53%	223.39***
t-statistics	-2.31**	16.16***	6.46***	-2.17**		
Panel C: Value weighted calendar-time portfolio (Non-acquirers) N = 4034						
Estimate	0.0003	1.2866	1.0943	-0.2847	82.11%	542.76***
t-statistics	0.14	25.90***	10.90***	-3.41***		
Panel D: Value weighted calendar-time portfolio (Frequent acquirers) N = 300						
Estimate	-0.0056	1.2656	0.8994	-0.3474	55.97%	130.21***
t-statistics	-1.69*	14.43***	4.89***	-2.14**		
Panel E: Value weighted calendar-time portfolio (Non-frequent acquirers) N = 652						
Estimate	-0.0038	1.3153	1.1038	-0.1415	68.90%	238.83***
t-statistics	-1.06	19.41***	11.31***	-1.37*		

Note: Table 2.5 presents the results for Fama and French three-factor model. Monthly returns on a portfolio composed of all IPO firms are calculated from month 13 to month 48 following the IPO. The dependent variable is the difference between monthly return on value-weighted calendar-time portfolio and monthly return on three-month Treasury bills. The independent variables are (1) RMRF is the difference between the return on a value-weighted market index and the monthly return on the three-month Treasury bills; (2) SMB is the difference in the returns of value-weighted portfolios of small stocks and big stocks, and (3) HML is the difference in the returns of value-weighted portfolios of high book-to-market stocks and low book-to-market stocks. Panel A reports estimates for all IPOs. Panel B and C present regression results for IPO first year acquirers and non-acquirers, respectively. Panel D and E show estimates for first year frequent and non-frequent acquirers, respectively. The results for t-statistics, adjusted R-squared and F-stat are reported for each model. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

2.4.2 Robustness tests

In this section, we perform several robustness checks. First, we analyze IPO first-year abnormal returns for IPO acquirers before and after the first acquisition. Second, we attempt to determine whether overlapping acquisitions influence the long-run performance of first-year IPO acquirers.

2.4.2.1 Decomposition of first-year abnormal return:

The purpose of this first test is to examine whether the abnormal returns of frequent acquirers after the acquisition depend on the order of the deal. To do so, we decompose first-year abnormal returns into (1) returns before the first acquisition, (2) returns between the first and second acquisition, and (3) returns after the second acquisition. Table 2.6 provides abnormal return results. We find that the mean CAR from the IPO to the first acquisition is highly positive and significant at the 1% level. It becomes lower but positive from the first acquisition to the second. However, a negative and statistically significant mean CAR is observed after the second acquisition, stopping at the end of the first IPO year. For example, the mean market-adjusted (*PSM*) CAR is 33.59% (49.40%) from the IPO date to the first acquisition. It becomes 3.90% (2.32%) between the first and second acquisition and -5.73% (-5.90%) after the second acquisition. Our results are robust for both the effective and announcement date of the acquisition. This implies that if the first deal of frequent acquirers does not negatively affect the long-run performance of IPOs, the second deal does. Hence, we confirm that frequent acquisitions in the first year after going public represent an important driver of underperformance.

Table 2.6 Decomposition of first- year returns for frequent IPO acquirers

	Panel A: by effective date		Panel B: by announcement date	
Calculation period	Mean	*p*-value	Mean	*p*-value
From IPO to 1st deal				
CAR (Market-adj)	33.59%	0.000	32.33%	0.000
CAR (*PSM*)	49.40%	0.000	41.35%	0.000
From 1st to 2nd deal				
CAR (Market-adj)	3.90%	0.022	9.60%	0.008
CAR (*PSM*)	2.32%	0.052	5.95%	0.081
From 2nd deal to the end of the 1st year after IPO				
CAR (Market-adj)	-5.73%	0.071	-6.14%	0.070
CAR (*PSM*)	-5.90%	0.021	-7.48%	0.001

Note: Table 2.6 reports mean cumulative abnormal returns for IPOs that frequently acquire in the first year of going public. Results are given from the IPO date to the first acquisition, from the first acquisition to the second acquisition and from the second acquisition to the end of the first year following going public, respectively. Panel A gives results using the effective date of acquisitions and Panel B gives results using the announcement date of acquisitions. The benchmark used is either CRSP value-weighted Index or PSM matched firms.

2.4.2.2 Subset of non-overlapping acquisitions

IPO firms that frequently acquire in the first year after going public could pursue their acquisition activity in a longer horizon. At the same vein, IPO firms making only one acquisition in the first year after going public could be considered as frequent acquirers if they engage in other acquisitions in the subsequent years. This implies that using a longer estimation period would increase the probability of first-year acquirers pursuing other acquisitions and thereby influencing the abnormal return estimation. To understand further this case and following Loughran and Vigh (1997), we consider a subset of IPOs that conduct acquisitions (frequent or not) only in the first year after going public without any other acquisitions between months 13 and 48 following the IPO (non-overlapping acquisitions)[14]. We report in Table 2.7 our event time results. Overall, we confirm that non-overlapping cases

[14] We are aware that from a trading strategy perspective, this could induce a look ahead bias since we do not have information if the firm will pursue acquisition or not at the offering.

have lower long-run performance than overlapping cases, regardless of the benchmark used. This implies that first-year IPO acquirers that stop their acquisition activity at the end of the first year after going public have poorer long-run performance than those that continue the acquisition activity in the next 4 years. For example, we find that $CAR_{1,4}$ is -22.51 (using PSM method) for overlapping cases and frequent first year acquirers, while it is -27.82 for non-overlapping cases and frequent first year acquirers.

Table 2.7 Cumulative abnormal returns for overlapping and non-overlapping cases

	$CAR_{1,2}$			$CAR_{1,3}$			$CAR_{1,4}$			$CAR_{1,5}$		
	Market- adj	Ind-Size-BM	*PSM*	Market- adj	Ind-Size-BM	*PSM*	Market- adj	Ind-Size-BM	*PSM*	Market- adj	Ind-Size-BM	*PSM*
Panel A: Overlapping cases												
N	453	452	275	453	452	275	453	452	275	453	452	275
Mean (%)	-9.82***	-5.93***	-12.75***	-10.42**	-6.74 **	-12.33***	1.16	-3.89	-2.78	6.72	-1.80	-1.10
Panel B : Non-overlapping cases												
N	333	331	233	333	331	233	333	331	233	333	331	233
Mean (%)	-24.64***	-13.73***	-14.86 ***	-31.98***	-20.06***	-21.44***	-25.55***	-24.35***	-18.29 ***	-20.72***	-25.66***	-19.94***
T- test	14.82***	7.8**	2.11	21.56***	13.32***	9.11	26.71***	20.46***	15.51*	27.44***	23.86***	18.84
Panel C : Overlapping cases :												
						Frequent first year acquirers						
N	180	179	120	180	179	120	180	179	120	180	179	120
Mean (%)	-25.20***	-17.32***	-20.47***	-37.73***	-22.84***	-32.36***	-30.31*	-19.67***	-22.51***	-26.72	-16.22**	-19.18**
						Non frequent first year acquirers						
N	273	273	155	273	273	155	273	273	155	273	273	155
Mean (%)	-3.66	1.54	-6.77	1.62	3.82	3.17	6.17**	6.46*	12.50*	7.14**	7.65*	12.90*
T- test	-21.54**	-18.86***	-13.70*	-39.35**	-26.66***	-35.53***	-36.48 **	-26.13***	-35.01***	-33.86**	-23.87***	-32.08**
Panel D: Non-overlapping cases:												
						Frequent first year acquirers						
N	53	53	56	53	53	56	53	53	56	53	53	56
Mean (%)	-46.28***	-30.38***	-22.11***	-41.96***	-32.49**	-32.12***	-26.55	-30.68*	-27.82**	-14.41	-30.69**	-23.62*
						Non frequent first year acquirers						
N	264	278	177	264	278	177	264	278	177	264	278	177
Mean (%)	-20.54***	-10.56***	-12.57***	-30.08***	-17.7***	-18.06***	-25.35***	-23.15***	-15.28**	-21.92***	-24.71***	-18.78**
T- test	-25.74**	-19.82***	-9.54	-11.88	-14.79	-14.43	-1.20	-7.53	-12.54	-7.51	-5.98	-4.84

Note: Table 2.7 presents mean cumulative abnormal returns for IPOs that acquire within the first year of going public, excluding the first year returns. Panel A gives results for overlapping cases defined as first year acquirers that pursue other acquisitions in the following 4 years. Panel B provides results for non-overlapping cases defined as first year acquirers that do not make any other acquisition within the 4 years following the first year of IPO. In panels C and D, we distinguish between frequent and non-frequent first year acquirers for overlapping and non-overlapping acquisitions. The benchmark returns are either the CRSP value-weighted index (Market-adj), matched firms based on Industry, Size and Book-to-Market ratio (Ind-Size-BM) or matched firms based on the Propensity Score Matching (*PSM*).The results of *t-tests* for the difference in means are also reported. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

2.4.3 Multivariate results

In order to understand the marginal effect of frequent acquirers on the long run performance of IPOs, we next estimate a multivariate regression model that controls for IPO characteristics that might influence performance. Our baseline model is as follows:

$$CAR_{1,5}^{i} = \beta_0 + \beta_1 Frequent_i + \beta_2 Multiple_i + \beta_3 Underpricing_i + \beta_4 VC\ backed_i + \beta_5 Proceeds_i + \beta_6 Prestige_i + \beta_7 SEO_i + \beta_8 HOT_i + \beta_9 Merger\ wave_i + \beta_{10} High_Tech_i + \varepsilon_i \quad (5)$$

The dependent variable is the cumulative abnormal returns calculated from months 13 to 60 following the IPO using the PSM method. *Frequent* is a dummy variable that takes the value of 1 if an IPO firm conducts frequent acquisitions during the first year of the IPO, and zero otherwise. *Multiple* is a dummy that takes the value of 1 if the IPO firm continues to acquire in the 4 years following the first year of IPO, and zero otherwise. *Underpricing* is 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, which is given as a percentage of the offer price. *VC backed* is a dummy variable that takes the value of 1 if the IPO is backed by a venture capital firm, and zero otherwise. *Proceeds* is defined as the natural logarithm of the capital raised at the time of the IPO. *Prestige* is a dummy variable that takes the value of 1 if the IPO's underwriter is in the top tier, and zero otherwise, using the rankings of Loughran and Ritter (2004)[15]. *SEO* is a dummy variable taking the value of 1 if the IPO conducts seasoned equity offerings in the 4 years following the first year of the IPO, and zero otherwise. We include this variable given the fact that SEOs in the first few years following the IPO could affect the long-run performance of newly public firms. We also control for hot issues market following Ibbotson and Jaffe (1975) and Ritter (1984). We define a hot issue market as a month in which average first-day return is above the median month's average first-day return. *HOT* is then defined as a dummy variable that takes the

[15] We thank Professor Jay. R. Ritter for making IPO underwriter reputation rankings data available on his web site.

value of 1 for hot issue market, and zero otherwise. To control for high M&A activity, we use Harford's (2005) industry merge wave indicator. A merger wave is identified when the number of acquisitions over 24 months exceeds the 95th percentile of the simulated probability distribution based on ten years of M&A activity. We use *Merger wave,* a dummy variable taken the value of 1 if an M&A wave occurs in any of the five post-IPO years we consider. We also include *High-Tech* variable to control for technology firms[16].

Further, as we find previously that IPO acquirers have different characteristics than IPO non-acquirers, we use the Heckman method to correct for potential sample selectivity bias. In the first stage, we consider a probit model to estimate the selection equation based on whether the IPO firm acquires or not in the first year following the IPO. We estimate the following equation:

$$y_i = \beta_0 + \beta_1 Underpricing_i + \beta_2\, VC\ backed_i + \beta_3\, Proceeds_i + \beta_4\, Prestige_i + \varepsilon_i \quad (6)$$

Where y_i =1 for IPO acquirers within 5 years of the IPO, and zero otherwise.

In the second stage, we estimate the regression (5) adding the inverse Mills ratio. Model 1 of Table 2.8 presents our estimation results for regression (5). Our results show that the coefficient of *Frequent* is -0.31 and significant at the 5% level, confirming that IPOs that frequently acquire in the first year of the IPO underperform more in the long run than do IPOs that infrequently acquire within the same period. To be sure that our findings are not influenced by any other acquisition transaction made by IPO firms during the 13-60 month period after the IPO, we include the variable *Multiple* in regression (5). Our results indicate that the coefficient of *Multiple* is positive (0.29) and significant at the 5% level. This implies that, while frequent first-year acquirers have poorer long-run performance than infrequent acquirers, conducting other acquisitions in years 2-5 following the IPO affects positively the long-run performance. This result is in accordance with the hypothesis of learning gains through repetitive acquisitions as suggested by Aktas et al. (2013).

[16] Technology firms are identified using Loughran and Ritter's (2004) list of tech SIC codes. We adjust this list by adding internet IPOs as defined in the Jay R. Ritter web site (updated through April 2012). http://bear.warrington.ufl.edu/ritter/ipodata.htm

In Models 2, 3 and 4 of Table 2.8, we run further tests. Specifically, in Model 2 of Table 2.8, rather than using a dummy variable that control for frequent acquirers, we consider the impact of the number of acquisitions made by acquirers in the first year after going public on the IPO's long-run performance. Our results show that the coefficient of *NUM_ACQ* (i.e., ln (1+ number of acquisitions)) is negative (-0.59) and statistically significant at the 5% level. Thus, we confirm that a higher number of acquisitions made in the first year after going public lowers the long-run performance of IPO firms. In Model 3, we examine the long-run performance of frequent first-year acquirers versus non-acquirers on the one hand, while in Model 4, we examine the long-run performance of infrequent first-year acquirers versus non-acquirers on the other hand. Our results show that frequent and infrequent first-year acquirers have significantly poorer long-run performance than IPOs that do not make any acquisitions within the first year of the IPO. Specifically, we find that being a frequent acquirer reduces the $CAR_{1,5}$ by -0.35% (Model 3), while being an infrequent acquirer reduces the $CAR_{1,5}$ by -0.14% (Model 4). Hence, we confirm that conducting frequent acquisitions in the first year of the IPO amplifies the IPO's long-run underperformance.

Table 2.8 Multiple regressions results

	OLS estimates			
	(1)	(2)	(3)	(4)
Constant	-0.17	-0.34	0.31	0.99***
	(-0.02)	(-0.04)	(0.96)	(3.07)
Frequent	-0.31**			
	(-2.18)			
NUM_ACQ		-0.59**		
		(-2.51)		
Multiple	0.29**	0.30**		
	(2.02)	(2.05)		
Underpricing	-0.07	-0.01	-0.08	0.01
	(-0.07)	(-0.02)	(-1.58)	(0.11)
VC backed	-0.02	-0.02	0.05	0.03
	(-0.11)	(-0.11)	(0.76)	(0.49)
Proceeds	-0.07	-0.06	-0.11***	-0.13***
	(-0.72)	(-0.61)	(-2.91)	(-3.54)
Prestige	0.19	0.20	0.17**	0.14**
	(1.18)	(1.24)	(2.39)	(2.19)
SEO	0.17	0.25	0.27***	0.32***
	(0.18)	(0.28)	(4.39)	(5.52)
HOT	-0.20	-0.18	0.04	0.01
	(-1.28)	(-1.23)	(0.51)	(0.16)
Merger wave	-0.13	-0.13	-0.16	-0.16
	(-0.58)	(-0.47)	(-1.58)	(-1.55)
High_Tech	0.46***	0.45***	0.18**	0.22***
	(3.01)	(2.65)	(2.54)	(3.22)
Invmills	0.40	0.76		
	(0.07)	(0.14)		
FRE_NACQ			-0.35***	
			(-3.10)	
NFRE_NACQ				-0.14*
				(-1.70)
Industry dummy	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes
Observations	470	470	1,878	2,030
R-squared	0.12	0.12	0.07	0.09

Note: The dependent variable is the cumulative abnormal return calculated from month 13 to month 60 following the IPO date using the *PSM* matching method. *Frequent* is dummy variable that takes the value of 1 if an IPO firm conducts frequent acquisitions during the first year of IPO, and zero otherwise. *Multiple* is a dummy that takes the value of 1 if the IPO firm continues to acquire in the 4 years following the first year of IPO, and zero otherwise. *Prestige* is a dummy variable that takes the value of one if the IPO's underwriter is in the top tier, and zero otherwise. *Proceeds* are defined as the natural logarithm of the capital raised at the time of the IPO. *VC backed* is a dummy variable that takes the value of 1 if the IPO is backed by a venture capital firm, and zero otherwise. *SEO* is a dummy variable taking the value of 1 if the IPO conducts seasoned equity offerings in the 4 years following the first year of IPO, and zero otherwise. *Underpricing* is 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. *HOT* is a dummy variable that takes the value of 1 if the IPO occurred during hot IPO market, and zero otherwise. *Merger wave* is a dummy variable that takes the value of 1 if the IPO occurred during period of merger wave, and zero otherwise. *High_Tech* is a dummy variable that takes the value of 1 if the IPO firm is in a technology industry or an internet firm, and zero otherwise. In model (2), we replace *Frequent* by *NUM_ACQ* which is the natural logarithm of one plus the number of acquisitions made by acquirers in the first year of going public. We estimate models (1) and (2) using the Heckman procedure. *Invmills* is the inverse Mills ratio. In model (3), we include *FRE_NACQ* is a dummy taking the value of 1 for frequent IPO acquirers and zero for IPO non-acquirers within the first year of IPO. *NFRE_NACQ* is a dummy that takes the value of 1 for single IPO acquirer and zero for IPO non-acquirer within the first year following going public. We also control for IPO industry and IPO year by including industry and year dummy variables in the basic model. For each independent variable, the first row reports its estimated coefficients and the second row reports the corresponding *p*-values. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Our multivariate analysis confirms that IPOs conducting frequent acquisitions obtain poorer long-run performance than both non-acquirers and IPOs making only one acquisition within the first year after going public.

2.4.4 Survival analysis of IPO acquirers

In this section, we consider survival analysis[17] for IPO acquirers to complement our previous results on long term performance. First, we apply a logistic regression methodology to examine factors that affect the probability of surviving for acquirers in the first few years following the IPO. Second, we use an accelerated failure time (*AFT*) model that allows us to assess the conditional probability of failure given that the IPO firm has survived up to the present time.

2.4.4.1 The multinomial logit model

We consider three post-IPO states two to five years after the IPO: survivor, acquired, and non survivor. We exclude the first year as it is the year of acquisition. Survivors are IPO firms that continue to operate as public corporations from months 13 to 60 after the IPO date. Hence, non-survivors are defined as IPOs that are delisted from the trading exchange for either negative reasons[18] (failure group) or being acquired in the same time period. Following Jain and Kini (1999), we first perform a multinomial logit regression analysis to evaluate the effect of our independent variables on the likelihood of survival. We estimate the following models:

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[17] For further details on IPO survival studies, see for examples Shultz (1993), Hensler et al. (1997), Jain and Kini (1999 and 2000), Boubakri, Kooli and L'Her (2005), and Kooli and Meknassi (2007).

[18] As suggested by Jain and Kini (2000), negative reasons include insufficient capital, insufficient float, liquidation, bankruptcy, non-payment of fees or delinquent in filings, failure to meet financial guidelines to list, insufficient number of market makers, price falling below acceptable levels, and insufficient number of shareholders.

$$\text{Log}\left(\frac{P_A}{P_S}\right)_i = \beta_0 + \beta_1 Frequent_i + \beta_2 Multiple_i + \beta_3 Proceeds_i + \beta_4 Underpricing_i + \beta_5 Prestige_i + \beta_6 Vc\ backed_i + \beta_7 SEO_i + \beta_8 HOT_i + \beta_9 Merger\ wave_i + \beta_{10} High_Tech_i + \varepsilon_i \quad (7)$$

$$\log\left(\frac{P_{NS}}{P_S}\right)_i = \beta_0 + \beta_1 Frequent_i + \beta_2 Multiple_i + \beta_3 Proceeds_i + \beta_4 Underpricing_i + \beta_5 Prestige_i + \beta_6 Vc\ backed_i + \beta_7 SEO_i + \beta_8 HOT_i + \beta_9 Merger\ wave_i + \beta_{10} High_Tech_i + \varepsilon_i \quad (8)$$

Where A = acquired, S = survivor, and NS = non surviving. P_A is the probability of being acquired, P_S is the probability of surviving, and P_{NS} is the probability of not surviving for negative reasons. Using eq. 7 and 8, we derive an eq. (9) to compare acquired and non surviving firms. We estimate the following model:

$$\log\left(\frac{P_A}{P_{NS}}\right)_i = \log\left(\frac{P_A}{P_S}\right)_i - \log\left(\frac{P_{NS}}{P_S}\right)_i = \beta_0 + \beta_1 Frequent_i + \beta_2 Multiple_i + \beta_3 Proceeds_i + \beta_4 Underpricing_i + \beta_5 Prestige_i + \beta_6 Vc\ backed_i + \beta_7 SEO_i + \beta_8 HOT_i + \beta_9 Merger\ wave_i + \beta_{10} High_Tech_i + \varepsilon_i \quad (9)$$

Our multinomial logit model results are reported in Table 2.9. Panel A presents regression results with the variable *Acquirer* to test whether acquiring in the first year after going public affects the probability of IPO firm survival. In Panel B, we include the variables *Frequent* and *Multiple* to assess whether IPO firms that frequently acquire in the first year after going public and continue their acquisition activity in the subsequent 4 years are more likely to survive in the post-IPO period. Panel C provides regression results with the variable *NUM_ACQ* to evaluate the impact of the number of acquisitions made in the first year of the IPO on the likelihood of surviving. Our results show that the probability of not surviving relative to surviving is significantly higher if the IPO firm becomes an acquirer in the first year after going public. We also find that making an acquisition in the first year of the IPO makes it more likely that an IPO firm is acquired as opposed to surviving. Further, IPO firms that acquire in the first year of the IPO are less likely to be acquired as opposed to not surviving, although this relation is not statistically significant. Panel B results highlight the

effect of being a frequent acquirer in the first year after going public on the likelihood of surviving. We find that frequently acquiring in the first year after the IPO significantly increases the probability of not surviving relative to surviving. Our findings also indicate that IPOs that conduct frequent acquisitions in the first year after going public are more likely to be acquired than to survive. This relation is significant at the 5% level. We also notice that making frequent acquisitions in the first year of the IPO negatively affect the probability of being acquired relative to not surviving, although this relation is not statistically significant. Panel C of Table 2.9 shows that the higher the number of acquisitions made by IPO firms within the first year of the IPO, the higher is the probability of not surviving relative to surviving. This relation is significant at the 1% level. Additionally, we find that IPOs making a large number of acquisitions in the first year after going public are significantly more likely to be acquired than to survive. Our results also show that higher number of acquisitions decrease the probability of being acquired relative to not surviving (which is significant at the 10% level).

Turning to our control variables, we find that larger IPO firms (firms with higher gross proceeds) are more likely to survive than not to survive. This relation is significant at the 1% level. IPOs with higher proceeds are also less likely to be acquired than to survive. In addition, we find that the larger the IPO firm's size, the higher the probability of being acquired relative to not surviving. Our findings also indicate that prestigious underwriters negatively affect the likelihood of not surviving relative to surviving. It also seems that IPOs underwritten by prestigious underwriters are more likely to be acquired than to not survive or survive. This result is indeed in line with Jain and Kini (1999). Also, conducting SEOs seems to be a significant factor in explaining the three post-IPO states. Specifically, we notice that IPOs that make SEOs in the first few years after going public are significantly less likely to fail or be acquired than to survive, and significantly more likely to be acquired than fail.

Table 2.9 Multinomial logit regression results

	Panel A			Panel B			Panel C		
	$Log(P_F/P_S)$	$Log(P_A/P_S)$	$Log(P_A/P_F)$	$Log(P_F/P_S)$	$Log(P_A/P_S)$	$Log(P_A/P_F)$	$Log(P_F/P_S)$	$Log(P_A/P_S)$	$Log(P_A/P_F)$
Constant	2.51***	1.85***	-0.65	3.19***	3.97***	0.78	1.93*	3.15***	1.42
	(5.73)	(5.83)	(-1.80)	(3.18)	(4.85)	(0.99)	(1.89)	(3.65)	(1.46)
Acquirer	0.56**	0.30*	-0.26						
	(2.40)	(1.78)	(-1.22)						
Frequent				1.02**	0.89**	-0.13			
				(2.24)	(2.69)	(-0.34)			
Multiple				-1.28***	-1.26***	0.02	-1.40***	-1.24***	0.22
				(-2.80)	(-3.88)	(0.06)	(-3.07)	(-3.84)	(0.57)
NUM_ACQ							2.20***	1.40***	-0.78
							(3.27)	(2.64)	(-1.39)
Proceeds	-0.78***	-0.47***	0.31***	-0.74***	-0.76***	-0.02	-0.81***	-0.78***	0.01
	(-6.02)	(-5.58)	(2.70)	(-3.07)	(-3.88)	(-0.09)	(-3.33)	(-3.96)	(0.06)
Underpricing	0.27	0.05	-0.22	0.51	0.41	-0.10	0.56	0.45	-0.17
	(1.58)	(0.35)	(-1.43)	(1.48)	(1.54)	(-0.47)	(1.57)	(1.62)	(-0.82)
Prestige	-0.53**	0.42**	0.95***	-0.78	0.48	1.26***	-0.77	0.46	1.30***
	(-2.21)	(2.26)	(4.35)	(-1.59)	(1.31)	(3.16)	(-1.61)	(1.26)	(3.16)
VC backed	0.06	0.29*	0.23	0.33	0.46	0.13	0.36	0.48	0.06
	(0.27)	(1.87)	(1.12)	(0.82)	(1.54)	(0.40)	(0.89)	(1.59)	(0.19)
SEO	-1.87***	-1.21***	0.64**	-1.47***	-0.93***	0.54	-1.54***	-0.96***	0.65
	(-6.48)	(-7.54)	(2.25)	(-3.35)	(-3.20)	(1.30)	(-3.58)	(-3.30)	(1.57)
HOT	0.20	0.26*	0.06	0.47	-0.11	-0.57	0.41	-0.15	-0.65
	(0.95)	(1.67)	(0.28)	(1.08)	(-0.36)	(-1.43)	(0.94)	(-0.52)	(-1.56)
Merger wave	0.41	0.22	-0.19	0.30	-0.56	-0.86*	0.24	-0.56	-0.88**
	(1.45)	(1.08)	(-0.75)	(0.59)	(-1.35)	(-1.95)	(0.49)	(-1.34)	(-2.02)
High_Tech	-0.32	0.06	0.40*	-0.53	-0.12	0.41	-0.49	-0.12	0.51
	(-1.34)	(0.40)	(1.83)	(-1.18)	(-0.39)	(1.06)	(-1.08)	(-0.37)	(1.27)
Log pseudolikelihood	-904.45			-271.816			-265.03		
Pseudo R^2	0.10			0.13			0.15		

Note: The dependent variable takes the value of 1 for survivors, 2 for non-survivors and 3 for acquired. P_A is the probability of the "Acquired" state, P_{NS} is the probability of "Non-Survivors" state and P_S is the probability of the "Survivors" state. In Panel A, we include *Acquirer*, a dummy variable that takes the value of 1 if the IPO firm conducts an acquisition during the first year of IPO, and zero otherwise. In Panel B, we include *Frequent* , a dummy variable that takes the value of 1 if an IPO firm conducts frequent acquisitions during the first year of IPO, and zero otherwise. In Panel C, we replace *Frequent* by *NUM_ACQ* which represents the natural logarithm of one plus the number of acquisitions made by acquirers in the first year of going public. *Proceeds* is a measure of the size of the IPO firm defined as the natural logarithm 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. *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. *SEO* is a dummy variable taken the value of 1 if IPO firm conducts seasoned equity offerings between month 13 and month 60 following the IPO, and zero otherwise. *HOT* is a dummy variable that takes the value of 1 if the IPO occurred during hot IPO market, and zero otherwise. *Merger wave* is a dummy variable that takes the value of 1 if the IPO occurred during period of merger wave, and zero otherwise. *High_Tech* is a dummy variable that takes the value of 1 if the IPO firm is in a technology industry or an internet firm, and zero otherwise. For each independent variable, the first row reports its estimated coefficients and the second row reports the corresponding *t*-statistics. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

2.4.4.2 The AFT model

One feature of the *AFT* model is that the baseline hazard function follows an assumed density function based on prior expectations. The basic model is given by the following equation:

$$Ln\,T(t;X) = \alpha + X\beta \tag{10}$$

Where T is the length of the trading period in months, X is a vector of independent variables that could have an effect on the length of the trading period, and β is a vector of model parameters. Following Hensler et al. (1997), we assume that the baseline hazard function follows a log-logistic density function.[19] Hence, we estimate a log-logistic *AFT* model where the dependent variable is the number of months an IPO survives from the date of listing to the date of delisting or the end of the fifth year following the IPO date (at the 60th month). The positive coefficient of the *AFT* model indicates both a higher probability of survival and an increasing trading period. Thus, a change in independent variables does not necessarily have a proportional effect on failure time, but can accelerate or decelerate the time-to-failure. We estimate the following *AFT* model for non-survivors and acquired IPO firms:

$$\begin{aligned} Ln\,T(t;X) = {} & \beta_0 + \beta_1 Frequent + \beta_2 Multiple + \beta_3 Proceeds + \beta_4 Underpricing \\ & + \beta_5\, Prestige + \beta_6\, VC\ backed + \beta_7\, SEO + \beta_8 HOT + \beta_9 Merger\ wave \\ & + \beta_{10} High_Tech \end{aligned} \tag{11}$$

The estimation results are reported in Table 2.10. We first test whether becoming an acquirer in the first year after going public affects the survival duration by including the variable *Acquirer* instead of the variable *Frequent* in the *AFT* model. We find that making acquisitions in the first year after going public is not related to the survival duration of acquired IPOs (the variable *Acquirer* is not statistically significant). However, there is a

[19] Hensler et al. (1997) argue that the duration to IPO delisting is likely to be non-monotonic. They suggest that the log-logistic is the most appropriate distribution function.

strong negative and significant relation between the survival duration of non-surviving IPOs and acquiring within the first year of the IPO. Second, when we consider the differential effect between being a frequent or infrequent acquirer in the first year after going public, we find that making frequent acquisitions in the first year of the IPO significantly decreases the time-to-failure for acquired firms, suggesting that frequent IPO acquirers are more likely to be quickly acquired in the post-IPO period. The same conclusion could be drawn for non-surviving firms. Specifically, we find a negative and significant relation between being a frequent acquirer in the first year after going public and survival duration. A higher *Frequent* coefficient (-0.29 vs. -0.21 for acquired results) means that frequent acquisitions strongly affect the time-to-failure for non-surviving IPOs relative to acquired firms.

We further address the issue of whether the number of acquisitions affects the survival duration for both acquired and non-surviving IPOs. The results reported in Table 2.10 indicate that there is a negative and significant relation between the survival duration and acquired IPOs. We find the same result for non-surviving group. The higher coefficient of NUM_ACQ for non-surviving IPOs relative to acquired IPOs(-0.65 compared to -0.41) implies that large number of acquisitions within the first year of the IPO decrease the survival duration for non-surviving IPOs relative to acquired firms, which is consistent with our multinomial logit results. Turning to our control variables, our results show that higher proceeds are positively and significantly related to survival duration for both acquired and non-surviving firms, suggesting that the time-to-survive increases along with size, this being in line with our previous results. We also find that there is a positive and significant relation between underwriter prestige and the survival duration of non-surviving IPOs. Further, we notice that IPO underpricing does not have a significant effect on the survival duration of acquired firms, while it significantly decreases the survival duration for non-surviving IPOs.

Table 2.10 Accelerated Failure Time (*AFT*) model results

	Survival vs. Acquired			Survival vs. Non survival		
	(1)	(2)	(3)	(1)	(2)	(3)
Constant	3.49***	3.20***	3.46***	3.36***	2.98***	3.41***
	(34.19)	(16.70)	(16.83)	(26.21)	(8.51)	(9.87)
Acquirer	-0.06			-0.24**		
	(-1.14)			(-2.52)		
Frequent		-0.21**			-0.29*	
		(-2.48)			(-1.77)	
Multiple		0.32***	0.33***		0.50***	0.53***
		(3.83)	(3.57)		(2.94)	(2.64)
NUM_ACQ			-0.41***			-0.65***
			(-2.96)			(-2.65)
Proceeds	0.12***	0.13***	(2.55)	0.23***	0.23**	0.23**
	(4.13)	(2.60)	-0.10	(5.12)	(2.31)	(2.39)
Underpricing	0.03	0.02	(0.54)	-0.03	-0.18*	-0.19*
	(0.65)	(0.32)	-0.08	(-1.17)	(-1.86)	(-1.70)
Prestige	-0.13**	-0.10	(-0.96)	0.23**	0.36**	0.38**
	(-2.22)	(-1.04)	0.31***	(2.26)	(2.12)	(2.00)
VC backed	-0.08	-0.07	(-1.07)	-0.01	-0.03	-0.02
	(-1.63)	(-0.92)	0.13**	(-0.14)	(-0.20)	(-0.13)
SEO	0.47***	0.31***	(3.80)	0.68***	0.47***	0.48***
	(8.84)	(3.88)	0.14	(6.21)	(2.70)	(2.84)
HOT	0.01	0.13	(1.59)	-0.09	-0.14	-0.09
	(0.18)	(1.60)	0.01	(-1.02)	(-0.86)	(-0.56)
Merger wave	-0.18***	0.02	(0.08)	-0.20*	-0.05	-0.02
	(-2.60)	(0.14)	-0.08	(-1.78)	(-0.27)	(-0.08)
High_Tech	-0.03	-0.07	(-0.86)	0.12	0.05	-0.02
	(-0.53)	(-0.83)	(0.54)	(1.29)	(0.32)	(-0.09)
Observations	846	263	263	502	152	152
Wald_test	131.3	52.07	64.30	138.4	58.89	59.56
Log_likelihood	-726.3	-209.2	-208.1	-305.7	-89.75	-87.15

Note: We estimate the *AFT* model for acquired and non-surviving IPOs. *Acquirer* is a dummy variable that takes the value of 1 if the IPO firm conducts an acquisition during the first year of IPO, and zero otherwise. *Frequent* is a dummy variable that takes the value of 1 if an IPO firm conducts frequent acquisitions during the first year of IPO, and zero otherwise. *Multiple* is a dummy that takes the value of 1 if the IPO firm continues to acquire in the 4 years following the first year of IPO, and zero otherwise. *NUM_ACQ* is the natural logarithm of one plus the number of acquisitions made by acquirers in the first year of going public. *Proceeds* is a measure of the size of the IPO firm defined as the natural logarithm 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. *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. *SEO* is a dummy variable taken the value of 1 if IPO firm conducts seasoned equity offerings between month 13 and month 60 following the IPO, and zero otherwise. *HOT* is a dummy variable that takes the value of 1 if the IPO occurred during hot IPO market, and zero otherwise. *Merger wave* is a dummy variable that takes the value of 1 if the IPO occurred during period of merger wave, and zero otherwise. *High_Tech* is a dummy variable that takes the value of 1 if the IPO firm is in a technology industry or an internet firm, and zero otherwise. For each independent variable, the first row reports its estimated coefficients and the second row reports the corresponding *t*-statistics. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

2.5 Conclusion

This paper reexamines whether making acquisitions in the first year of the IPO explains the long-run performance of IPOs. We extend the work of Brau et al. (2012) in three directions: (1) we distinguish between IPOs making only one acquisition one year after going public and IPOs making multiple acquisitions within the same period; (2) we take into account the clustering of acquisition events by the same firm and consider the cases of overlapping and non-overlapping firms separately. The purpose is to evaluate whether acquisition order helps to explain the long-run performance of frequent IPO acquirers; (3) we move beyond the long-run performance analysis and provide evidence on whether the post IPO survival time is influenced by the number of acquisitions made by IPO firms in the first year after going public.

Using both event-time and calendar-time approaches to assess long-run abnormal returns of IPO firms, we find that that frequent acquirers experience significantly poorer performance in the five years following the IPO. This result is robust for the use of *PSM*, a new matching technique that allows us to more accurately define control firms. We perform several robustness checks for our results. First, we decompose first year abnormal returns and find that the first deal of frequent acquirers does not negatively affect the long-run performance of IPOs. The second deal however does. Second, to ensure that our results are not affected by overlapping cases defined as IPOs that acquire in the first year of the IPO and continue their acquisition activity in the following 4 years, we calculate cumulative abnormal returns for overlapping and non-overlapping cases. Our findings indicate that first-year IPO acquirers continue to underperform five years following the IPO. Nevertheless, overlapping acquisitions help to alleviate the level of long-run underperformance. We also find strong evidence that IPOs that frequently acquire within the first year after going public have a much lower performance than those that infrequently acquire, using a calendar-time approach and excluding overlapping acquisitions.

We control for making additional acquisitions in the 4 years following the first year of the IPO and find that while frequent first-year acquirers have poorer long-run performance than infrequent acquirers, conducting other acquisitions in years 2-5 following the IPO affects positively the long-run performance. The hypothesis of learning gains through repetitive acquisitions (Aktas et al. 2013) could be a plausible explanation for this result.

Further, we perform a survival analysis to examine the effect of being a first-year acquirer on the survival profile of IPOs in the following 5 years. Our multinomial logit models show that being a frequent acquirer in the first year after going public increases the probability of not surviving and that the higher the number of acquisitions is, the higher is the probability of not surviving. Our *AFT* model confirms this evidence, suggesting that frequently acquiring in the first year of the IPO decreases the time-to-survive for non-surviving firms and that making a large number of acquisitions is also likely to decrease the survival duration of non-surviving IPOs. Our findings offer new driver to the well-documented IPO long-run underperformance. We hope to see additional research on the role and motivations of serial acquisitions after the IPO.

REFERENCES

Aggarwal, R., Rivoli, P., 1990. Fads in the initial public offering market? Financial Management 22. 42-53.

Aktas, N. de Bodt,, E., Roll, R., 2009. Learning, hubris and corporate serial acquisitions. Journal of Corporate Finance 15, 543-561.

Aktas, N., de Bodt, E., Roll, R., 2011. Serial acquirer bidding: An empirical test of the learning hypothesis. Journal of Corporate Finance 17, 18-32.

Aktas, N., de Bodt, E., Roll, R., 2013. Learning from repetitive acquisitions: Evidence from the time between deals. Journal of Financial Economics 108, 99-117.

Amihud, Y., 2002. Illiquidity and stock returns: Cross-section and time-series effects. Journal of Financial Markets 5, 31–56.

Antoniou, A., Zhao, H., 2004. Long run post takeover stock return: the impact of overlapping return, takeover premium and method of payment, Working paper.

Bessembinder, H., Zhang, F., 2013. Firms characteristics and long-run stock returns after corporate events. Journal of Financial Economics 109, 83-102.

Billett, M.T., Flannery, M.J., Garfinkel, J.A., 2011. Frequent Issuers' Influence on Long-Run Post-Issuance Returns. Journal of Financial Economics 99, 349-364

Billett, M.T., Qian, Y., 2008. Are overconfident CEOs born or made? Evidence of self-attribution bias from frequent acquirers. Management Science 54, 1037-1051.

Boubakri, N., Kooli, M., L'Her, J.F., 2005. Is there any life after going public? Evidence from the Canadian market. Journal of Private Equity 8, 30-40.

Brau, J. C., Francis, B., Kohers, N., 2003. The choice of IPO versus takeover: Empirical evidence. Journal of Business 76, 583-612.

Brau, J. C., Fawcett, S.E., 2006. Initial public offerings: An analysis of theory and practice. Journal of Finance 61, 399-436.

Brau, J.C., Couch, R.B., Sutton, N.K., 2012. The desire to acquire and IPO long-run underperformance. Journal of Financial and Quantitative Analysis 47, 493-510.

Brav, A., Gompers, P., 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., Geczy, C., Gompers, P., 2000. Is the abnormal return following equity issuance anomalous? Journal of Financial Economics 56, 209–249.

Cao, J., Fuwei, J., Ritter, J.R., 2013. Patent-and innovation-driven performance in venture capital-backed IPOs. Working paper.

Carter, R., Dark, F., Singh, A., 1998. Underwriter reputation, initial returns, and the long-run performance of IPO stocks. Journal of Finance 53, 285-311.

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

Dong, M., Michel, J.S., Pandes, J.A., 2011. Underwriter quality and long-run IPO performance. Financial Management 40, 219-251.

Fama, Eugene F., 1998. Market efficiency, long-term returns, and behavioral finance. Journal of Financial Economics 49, 283-306.

Fama, E. F., French, K., 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 43, 3-56.

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

Hensler, D., Springer, T., Rutherford, R., 1997. The survival of initial public offerings in the aftermarket. Journal of Financial Research 1, 93-110.

Hovakimian, A., Hutton, I., 2010. Merger-motivated IPOs. Financial Management 39, 1547-1573.

Hsuan-Chi, C., Sheng-Syan, C., Chia-Wei, H., 2012. Why do insiders sell shares following IPO lockups? Financial Management 41, 813-847.

Ismail, A., 2008. Which acquirers gain more, single or multiple? Recent evidence from the USA market. Global Finance Journal 19, 72-84.

Jain, B., Kini, O., 1999. The life cycle of IPO firms. Journal of Business Finance and Accounting 26, 1281-1307.

Jain, B., Kini, O., 2000. Does the presence of venture capitalists improve the survival profile of IPO firms? Journal of Business Finance and Accounting 27, 1139-1176.

Kooli, M., Meknassi, S., 2007. The survival profile of U.S. IPO issuers 1985-2005. Journal of Wealth Management 10, 105-119.

Krishnan, C.N.V., Ivanov, V.I., Masulis, R.W., Singh, A.K., 2011. Venture capital reputation, post-IPO performance, and corporate governance. Journal of Financial and Quantitative Analysis 46, 1295-1333.

Kuntara P.L., Nikhil, V., 2007. IPO pricing, block sales and long-term performance. Financial Review 42, 319-348.

Loughran, T., Ritter, J., 1995. The new issues puzzle. Journal of Finance 50, 23–51.

Loughran, T., Vijh, A. M. 1997. Do long-term shareholders benefit from corporate acquisitions? Journal of Finance 52, 1765-1790.

Lyon, J. Barber, B., Tsai, C.L., 1999. Improved methods for tests of long-run abnormal stock returns. Journal of Finance 54, 165-201.

Miller, E., 1977. Risk, uncertainty and divergence of opinion. Journal of Finance 32, 1151–1168.

Mitchell, M.L., Stafford, S., 2000. Managerial decisions and long-term stock price performance. Journal of Business 73, 287–329.

Ritter, J., 1991. The long-run performance of initial public offerings. Journal of Finance 46, 3–27.

Rosenbaum, P.R., Rubin, D.B., 1983. The central role of the propensity score in observational studies for causal effects. Biometrika 70, 41–55.

Shultz, P., 1993. Unit initial public offerings. Journal of Financial Economics 34, 199-229.

Teoh, S., Welch, I., Wong, T., 1998. Earnings management and the long-run market performance of initial public offerings. Journal of Finance 53, 1935–1974.

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

CHAPITRE III

ARTICLE 3

DOES INTENDED USE OF PROCEEDS AFFECT THE LONG-RUN PERFORMANCE OF IPOS?

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ABSTRACT

We hand collected data from IPO prospectus on the primary use of proceeds of IPO firms and related it to their long-run stock performance, operating performance, and survival profile. Specifically, we cover the 1996-2012 period and examine four categories of proceeds use: debt payment, investment, marketing and sales promotion, and general corporate purposes. We find that IPOs declaring investment plans as the primary use of proceeds exhibit lower underperformance in the three years following the IPO, while IPOs that state debt payment or general corporate purposes as the primary use of proceeds are the highest underperformers. Further, we find significant declines in operating performance when the issuer declares debt payment as the intended use of proceeds. We also provide new evidence for the role that the primary use of proceeds plays in explaining the timing motive of IPO firms. Our survival analysis shows that stating debt payment as use of proceeds increases the risk of failure during the five years following IPO by about 90%.

JEL: G32
Keywords: initial public offerings, performance, use of proceeds

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3.1 Introduction

Previous empirical studies provide evidence that initial public offerings (IPOs) exhibit poor long-run stock performance compared to non-issuing firms (Ritter, 1991, Loughran and Ritter, 1995, Brav and Gompers, 1997, Brav et al. 2000, Schultz, 2003, among others). Several possible explanations for the poor subsequent stock performance of issuing firms are advanced in the literature, including the divergence of opinion hypothesis (Miller, 1977), the "impresario" hypothesis (Aggarwal and Rivoli, 1990), and the "windows of opportunity" hypothesis (Ritter, 1991 and Loughran and Ritter, 1995). Several studies have also documented significant declines in post-IPO operating performance (Jain and Kini, 1994, and Mikkelson et al., 1997, among others). However as noted by Eckbo et al. (2007, p. 339)" *the proper interpretations of the low long-run returns following security issuances remains an unsettled issue*".

In this study, we introduce the intended use of proceeds as an explanatory variable for the long-run performance of IPO firms. When a company files to go public, it must prepare a prospectus which contains information about how it intends to use the proceeds in accordance with the Securities and Exchange Commission (SEC) rules. An issuer may satisfy this requirement by providing specific details or a vague overview. For example, the intended use of proceeds stated in the S-1 form (the registration statement filed with the SEC) could be, among others, future acquisitions, R&D, debt repayment, or general corporate purposes without any specification. The information disclosed in the stated use of proceeds may provide insight into the motivation of initial public offerings. Why firms go public has been widely documented in previous studies. Pagano et al. (1998) find that the predominant reason Italian firms go public is to rebalance their accounts after a period of high investment and growth to exploit mispricing, rather than to raise capital to finance subsequent investment. They point out that investment and profitability decrease after the offering. Rosen et al. (2005) explore the going public decision of depository institutions and find that the initial public offering is a channel through which banks raise capital to finance their acquisition strategy. Brau et al. (2006) survey 336 chief financial officers to compare practice to theory

in, among other things, motivations for firms going public. Their results show that the creation of public shares for acquisitions and the establishment of the market price or value of the firm are the two most important reasons for going public. Explanations such as lowering the cost of capital and establishing a pecking order of alternative financing sources are viewed as the two least important reasons. Kim et Weisbach (2008) examine changes in total assets, capital expenditures, acquisitions, R&D, cash holdings and long-term debt after going public of 17,226 IPOs and find that firms spend substantial amounts on R&D and capital expenditures, which suggests that equity offerings are primarily used to raise capital to finance investment. The different ways in which IPOs might spend the capital they raise at the offering raises questions about whether the ex-ante disclosure of the intended purpose for the proceeds has an effect on their post-IPO performance. To the best of our knowledge, this question has not been previously examined in the IPO context.

We investigate four intended uses of proceeds that are generally stated in the firm's S-1 form for the Securities and Exchange Commission (SEC): debt repayment, investment, marketing and sales promotion, and general corporate purposes. In the investment group, we include acquisition, R&D, and capital expenditure. The category of general corporate purposes includes firms that choose to be ambiguous about their planned use of proceeds without any clear specification. Our intuition is that issuing firms which state investment purposes as the use of proceeds are less likely to underperform in the long run. The increased investment expenditures should be viewed favourably as they are associated with higher investment opportunities. However, companies specifying debt payment as the intended use of proceeds may take advantage of overvalued stocks by timing IPOs to periods of high returns to pay down their debt. Consequently, they are more likely to underperform in the long run (according to the window opportunity hypothesis). Baker and Wurgler (2002) present evidence suggesting that market timing of equity offerings is an important determinant of' the observed capital structure of firms. Market timing considerations also seem to be important for firms that do not provide details about the intended use of proceeds. Autore et al. (2009) find that SEOs without specific investment plans are more likely to underperform in the three years following the issue than those with specific investment purposes.

We contribute to the existing IPO literature in several ways. First, we hand collected data on the intended use of proceed from IPO prospectus and examine the link between ex-ante stated use of proceeds and the long-run stock performance of IPO firms. This issue remains indeed an unexplored area. Kim and Weisbach (2008) examine ex-post use of proceeds and find that firms raise capital both to invest and to exploit favourable market conditions. In this study, we examine whether the pre-IPO disclosure of the intended use of proceeds affects the stock performance of IPO firms. Second, we examine changes in the operating performance of our IPO sample from one year prior to the offering to three years after based on the intended use of proceeds. Third, we provide evidence about the possible relationship between ex-ante use of proceeds disclosure and IPO motives. Particularly, we extend the existing literature by documenting a link between timing and not timing motives and the different categories of intended use of proceeds. Finally, we explore whether the survival profile of IPO firms is affected by their stated use of proceeds.

We find that IPO firms that state investment as intended use of proceeds exhibit insignificant average abnormal returns in the three years following the IPO. However, when the stated use of proceeds is debt payment, our results show significant poorer stock underperformance. Moreover, we find no evidence of post-IPO deterioration in operating performance when IPOs cite investment as use of proceeds, but significant declines in operating performance when the stated use of proceeds is debt payment. Our survival analysis shows that IPOs that cite investment as use of proceeds are more likely to survive during the five years following the IPO. However, declaring debt payment as intended use of proceeds increases the risk of failure by about 90%.

The remainder of the paper is organized as follows: Section 2 presents the literature review, Section 3 describes the data and methodology, Section 4 provides the results, and Section 5 concludes.

3.2 Literature review

Recent empirical studies have focused on the relationship between the intended use of proceeds and the long-run performance of seasoned equity offerings (SEOs). Walker and Yost (2008) consider a sample of 438 firms issuing SEOs between 1997 and 2000. They examine the ex-ante reasons stated by the firm for the use of capital, the actual ex-post use of capital, and the market reaction to this information. They find that, regardless of the stated use of proceeds, issuing firms increase R&D and capital expenditure following the offering. They also find that the level of long term debt increases after the offering even for firms that specify that proceeds are being put towards debt reduction. Regarding the primary use of proceeds, Walker and Yost (2008) find that the market reacts more favourably if the firm provides specific investment plans about the use of the capital being raised. Their results also show that changes in operating performance from one year prior the issue to two years after is lower for firms that do not disclose specific investment programs for the use of funds than for those that do.

Autore et al. (2009) consider a sample of 880 SEOs from 1997 to 2003 to examine the link between seasoned equity issuers' stated intended use of proceeds and their stock and operating performance in the three years following the issue. They calculate significant negative average abnormal returns when the stated use of proceeds is recapitalization or general corporate purposes. However, average abnormal returns are not significant for issuers specifying investment plans for the proceeds. They also find significant declines in industry-adjusted operating performance when the intended use of proceeds is recapitalization or general corporate purposes. Less evidence of decline is observed when the stated use is investment. Autore et al. (2009) argue that SEO firms citing recapitalization or general corporate purposes as the intended use of proceeds employ a timing strategy by issuing equity when the market overvalues their stocks, which explains their poor long-run performance. However, firms that state investment as the intended use of proceeds signal their future investment opportunities. Consequently, they should not be expected to underperform in the long run.

Jeanneret (2005) examines the relationship between the intended use of proceeds and the long-run performance of French SEOs between 1984 and 1998. He finds that firms which state they are going to use proceeds for capital structure purposes do not experience long-run underperformance within the three years following the issue. However, when the intended use of proceeds is for financing investment projects, SEO firms show significant long-run underperformance. According to Jeanneret (2005), firms that cited debt payment as the intended use of proceeds are concerned about preserving their financial flexibility and improving their capital structure. Therefore, they should not underperform in the long run. However, when the stated use of proceeds is investment, issuing firms may face the information asymmetry problems or agency conflicts that are predicted by theories about marginal financing decisions. In this case, they could underperform in the post-issue period.

Leone et al. (2007) empirically examine the economic consequences of the use of proceeds disclosure on the first-day returns of IPO firms. They find that IPOs disclosing specific information about use of proceeds experience less underpricing than IPOs without any specification. This result could be explained by the fact that disclosures reduce the ex-ante uncertainty about the true value of the stock. Our study extends this strand of research by examining the relationship between the intended use of proceeds and the long-run performance of IPOs.

3.3 Data and methodology

3.3.1 Sample selection and use of proceeds classification

Our initial sample of IPOs is collected for the period 1996 to 2012 using Securities Data Company's (SDC) Global New Issues Database. We exclude ADRs, unit offerings and IPOs with an offer price of less than $5. We also exclude financial firms (two-digit SIC 60) and utility (two-digit SIC 49) firms. To be included in the sample, the stock return data of the IPO firms must be available from the Center for Research in Securities Prices (CRSP) for the three years subsequent to the issue. Our next requirement is that the firms must have financial data available from COMPUSTAT for the fiscal year prior to the IPO.

The primary intended use of proceeds is hand collected from the firms' S-1 filings in EDGAR. Although this information is also provided by the SDC, there is no specific use of proceeds for the majority of cases. Our manual collection from the S-1 filings provides more precise information. Our sample begins in June 1996 because the companies' filing statements are not available before this date. Our final sample contains 1,140 IPOs classified in four groups according to their primary use of proceeds: investment, debt payment, marketing and sales promotion, and general corporate purposes. The IPOs in the first group (INVEST) are those that state that the proceeds are to be used primarily for investment purposes, including future acquisitions, R&D, or capital expenditures. Issuers in the second group (DEBT) largely specify repayment of debt as the primary use of proceeds without mentioning any specific investment plans. IPOs in the third group (SALES) are those that state that the majority of proceeds are to be used to expand sales and marketing activities. Issuers in the fourth group (GENERAL) choose to be ambiguous about their planned use of proceeds, stating general corporate purposes.

Summary statistics for our sample, grouped by the use of proceeds, are presented in Table 3.1. We find that IPOs that state investment as the primary use of proceeds have the lowest first-day underpricing. The mean (median) underpricing for these IPOs is 16.26% (2.5%) as compared with 44.65% (25.83%) for IPOs that state marketing and sales promotion as the intended use of proceeds and 42.22% (14.05%) for IPOs choosing to give a vague overview about their primary use of proceeds. The mean level of underpricing for the firms' stated debt payment is relatively low (19.90%) when compared with marketing activities and general categories. Our results are consistent with Leone et al. (2007), who find that issuers disclosing specific details about their intended use of proceeds reduce the ex-ante uncertainty about the true value of their shares and are consequently subject to less underpricing. They also find a negative and significant relationship between, on the one hand, investment and debt payment as the intended use of proceeds and, on the other, the level of underpricing, while this relation becomes positive but insignificant when the stated use of proceeds is marketing and sales promotion.

Table 3.1 also shows that firms that state marketing and sales promotion as the intended use of proceeds are larger and raise more proceeds. The mean market value of these firms is $1,044.5 million as compared to $186.33 million for IPOs that state investment as the primary use of proceeds. This implies that small firms issue equity for growth prospect purposes, a notion which is consistent with our expectations. We also find that the debt ratio before the offering is higher for IPOs that state debt payment as the intended use of proceeds. The mean proportion of total debt relative to total assets is 0.373 for the debt payment group as compared to 0.27, 0.17, and 0.22 for the investment, marketing and sales promotion, and general corporate purposes categories, respectively.

Table 3.1 Sample summary statistics

Panel A: Number of issues per year

Year	Number of issues
1996	167
1997	166
1998	122
1999	210
2000	165
2001	18
2002	10
2003	20
2004	38
2005	15
2006	29
2007	59
2008	6
2009	10
2010	28
2011	42
2012	35
1996-2012	1140

Panel B: IPO characteristics by intended use of proceeds categories

	INVEST		DEBT		SALES		GENERAL	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Underpricing	16.26	2.5	19.90	9.09	44.66	25.83	42.23	14.05
Market value	186.34	64.9	281.24	84.3	1044.50	142.35	452.20	172.95
Proceeds	77.96	50	92.63	49.5	290.32	57.25	106.78	65.9
Debt ratio	0.28	0.19	0.37	0.29	0.17	0.10	0.23	0.08
Relative offer size	3.13	0.43	2.80	0.42	0.92	0.28	47.41	0.28
Number of IPOs	245		369		112		414	

Note: Table 3.1 presents frequency distribution and descriptive statistics by intended use of proceeds category of 1140 IPO firms. *INVEST* is the group of IPOs stated investment as intended use of proceeds. *DEBT* is the group of IPOs stated debt payment as intended use of proceeds. *SALES* is the category of IPOs cited marketing and sales promotion as intended use of proceeds. *GENERAL* is the category of IPOs choosing to give ambiguous view about their use of proceeds. *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. *Market value* is the stock price times the number of shares outstanding on the day prior to the offer. *Proceeds* is a measure of the size of the IPO firm defined as the natural logarithm of the total capital raised at the time of the IPO. *Relative offer size* is the number of shares offered divided by the number of shares outstanding on the day prior to the offer. *Debt ratio* is the ratio of long-term debt plus short-term debt to total book assets in the year prior to the issue.

3.4 Methodology

3.4.1 Long-run stock performance

To calculate the long-run performance of IPO firms, we use two approaches. First, we take an event time approach using the standard cumulative abnormal return (CAR) measure. We then adopt a calendar time approach using the alphas from the Fama and French (FF) three-factor model.

For each calendar month, we calculate the return on a portfolio composed of IPO firms that carry out an IPO in the past 36 months. To determine the return on a portfolio, we use value-weighted average returns. The calendar-time returns on this portfolio are used to estimate the following regression:

$$R_{pt} - R_{ft} = \alpha_p + \beta_1(R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \varepsilon_t \quad (1)$$

Where R_{pt} is the monthly return on a value-weighted calendar-time portfolio of IPOs, R_{ft} is the monthly return on treasury bills, R_{mt} is the return on a value-weighted market index, SMB_t is the difference, each month, between the returns of a value-weighted portfolio of small and big stocks, and HML_t is the difference, each month, between the returns of a value-weighted portfolio of high book-to-market stocks and low book-to-market stocks. α_p is the intercept term and represents the mean monthly excess return on the calendar-time portfolio.

We calculate mean cumulative abnormal returns (MCAR) based on three benchmarks: (i) the value-weighted CRSP index; (ii) a sample of firms matched by industry, size, and book-to-market ratio; and (iii) a sample of firms matched using a propensity score matching (PSM) technique based on Rosenbaum and Rubin's (1983) propensity score theorem.

In order to select matching firms based on industry, size, and book-to-market ratio, we first create a sample of possible matching firms listed on CRSP and having at least 5 years data without any stock issues within 5 years. Second, we identify all firms within the same industry (2-Digit SIC) as the IPO sample. Third, following Lyon et al. (1999), we choose all firms with market capitalization between 70% and 130% of the IPO firms at the end of the

fiscal year in which the IPO takes place. Finally, from this subset, we choose the firm with the book-to-market ratio closest to that of the IPO firm. Further, to obtain control firms that are as similar as possible to IPO firms, we employ the propensity score matching technique. The outcome of this method is the conditional probability, called the propensity score, of being in the treated group (in our case, the IPO decision) given the observed variables. We estimate the propensity score as follows: let $Y_{i,t}$ be an event indicator that is equal to 1 for IPO firms and 0 for non-IPO firms. Let $X_{i,t}$ be a vector of independent variables (firm characteristics) observed for firm i (IPOs as well as non-IPO firms) in fiscal year t (the IPO year). A propensity score logit function is defined as $P_{i,t} = (Y_{i,t} = 1/X_{i,t})$ for each fiscal year (t takes a value from 1980 to 2006). We use the "nearest neighbor" matching method which allows us to match each IPO firm to a single control firm with the closest propensity score ($P_{i,t}\ value$). Specifically, we use six firm characteristics as conditioning variables to estimate the propensity score: idiosyncratic volatility, illiquidity, momentum, market beta, size, and book-to-market ratio. Following Bessembinder and Zhang (2013), we measure idiosyncratic volatility as the annualized standard deviation of the residuals in monthly regressions of daily stock returns calculated with the three Fama and French (1993) factors (over the 12 post-IPO months). A measure of illiquidity is constructed using the Amihud (2002) method. For each stock and for each of the 12 months after the IPO, we measure illiquidity as the average of the daily ratio of absolute stock return to the dollar trading volume. Market beta is estimated for each firm and for each of the 12 months after the IPO by implementing the market model in daily stock returns. All these estimates are averaged across 12 months. Return momentum is computed as the cumulative return from month 1 to month 11 after the IPO. Firm size is defined as the market capitalization at the fiscal year-end following the IPO. Book-to-market ratio is measured as the book value of equity over the market value of equity at the end of the fiscal year of the IPO event. We calculate mean cumulative abnormal returns over three years following the IPO starting one month after the IPO date to avoid any short run effect. We further incorporate use of proceeds dummy variables with other IPO characteristics that could influence the post-IPO long-run stock performance in a multivariate regression analysis. Our objective is to assess the differential effect of the use of proceeds categories on the IPO stock performance. Our dependent

variable is the cumulative abnormal returns over three years following the IPO obtained using the propensity score matching method.

3.4.2 Long-run operating performance

We employ two measures of the operating performance of IPO firms. The first measure is the operating cash flow scaled by total assets defined as the operating income before depreciation and taxes minus capital expenditures, divided by total assets. The second measure is operating income scaled by sales. Following Jain and Kini (1994) and Barber and Lyon (1996), we use median values given the fact that operating performance measures could be skewed and sensitive to outliers.

We focus on changes in the operating performance of our IPO sample. We measure unadjusted change in operating performance as the median change in levels from the year prior to the IPO to two years following the offering, the IPO year to two years following the offering, and the IPO year to three years following the offering. Further, we measure changes in adjusted operating performance using two matching techniques. First, we use industry adjusted operating performance by matching each IPO firm with firms in the same industry based on the two-digit SIC code. We compute the industry-adjusted change in operating performance of an IPO firm as the difference between its change in operating performance and the median change in operating performance of all firms in its industry.

Second, as Barber and Lyon (1996), we use a matching method based on industry and prior IPO operating performance. We employ this technique to control for possible mean reversion resulting from abnormal pre-event performance at the industry level. For each IPO firm, we identify all firms with the same two-digit SIC code and with an operating performance between 90% and 110% of the IPO's operating performance at the end of the fiscal year prior to the offering. Among these firms, we choose the matching firm with the closest performance measure to that of our sample firm. If there is no match based on these criteria, we use a one-digit code and if that does not generate any matches, we use the pre-issue performance without the SIC criterion. We compute changes in industry and pre-IPO adjusted operating performance by subtracting the operating performance change of the

control firm from the operating performance change of the IPO firm. All changes are computed from the year prior to the IPO to two years following the offering, the IPO year to two years after the offering, and the IPO year to three years after the offering.

Following Autore et al. (2009), we further run median quantile regressions to assess the effect of differences in intended use of proceeds on the long-run operating performance of IPO firms. We also consider OLS estimations based on winsorized operating performance measures at the 5^{th} and 95^{th} percentiles.

3.5 Empirical results

3.5.1 Long-run stock performance

Table 3.2 reports mean cumulative abnormal returns for the 36-month horizon following the IPO beginning in the month immediately following the offer month using the three matching techniques. Our results show that IPO firms, regardless of the matching method, significantly underperform in the long run, which is consistent with prior literature (Ritter, 1991). For example, the CAR for the 36-month is -16.32% and statistically significant at the 1% level when we use the PSM method. When IPO proceeds are expected to be used for specific investments, the mean cumulative abnormal returns are negative but weakly significant with size/industry/BM adjusted returns (-7.49). They are insignificant however when we use the PSM method. Thus, compared to the debt payment, marketing and sales promotion, and general corporate purposes classifications, IPOs that state investment as the intended use of proceeds present more favorable long-run stock performance. For example, using PSM method, we find that the CAR for the 36-month horizon is only -9.55% for the investment group whereas it is about -22%, - 13%, and -17% when the intended uses of the proceeds are debt reduction, marketing activities, and general corporate purposes respectively.

Panel D of Table 3.2 reports differences in means between the investment group and all other groups. We find that differences between the investment and debt payment groups ((1) vs. (2)) are significant at the 10% level, indicating that CARs are significantly higher if investment is stated as the primary use of proceeds than if debt payment is the stated use. The results also show that the three-year horizon abnormal returns for IPO firms are significantly greater when the firm states specific investment plans for their use of proceeds as opposed to debt repayment, marketing activities or general corporate purposes.

Table 3.2 Mean cumulative abnormal returns

	Cumulative abnormal returns over 3 years following the IPO		
Panel A: Mean CARs using market adjusted returns			
	N	Mean(%)	P-value
All issuers	1140	-3.74	0.18
INVEST(1)	245	3.71	0.33
DEBT(2)	369	-22.93***	0.00
SALES(3)	112	8.59	0.28
GENERAL(4)	414	6.07	0.20
Panel B: Mean CARs using industry, size and BM adjusted returns			
All issuers	1139	-16.98***	0.00
INVEST	245	-7.49*	0.09
DEBT	369	-16.01***	0.00
SALES	111	-28.77***	0.00
GENERAL	414	-20.30***	0.00
Panel C: Mean CARs using propensity score matching technique (PSM)			
All issuers	713	--16.32***	0.00
INVEST	140	-9.55	0.14
DEBT	211	-21.09***	0.00
SALES	82	-13.32	0.12
GENERAL	280	-16.91***	0.00
Panel D: P-value of differences in means			
	Market-adj	Ind-size-BM-adj	PSM- adj
(1) versus (2)	0.09	0.33	0.06
(1) versus (3)	0.30	0.02	0.56
(1) versus (4)	0.23	0.07	0.14
(1) versus (2,3 and 4)	0.11	0.07	0.06

Note: Table 3.2 presents mean cumulative abnormal returns over three years following the IPO. Panel A reports market adjusted abnormal returns. Panel B presents abnormal returns using matches based on industry, size and book to market ratio. Panel C presents same statistics using propensity score matching method. The first row of each panel reports results for all issuers and the subsequent four rows presents Mean CARs for four categories of intended use of proceeds: INVEST where investment is stated as use of proceeds, DEBT where debt repayment is stated as use of proceeds, SALES where marketing and sales promotion is cited as use of proceeds and GENERAL where the stated use of proceeds is general corporate purposes. Panel D reports P-values for tests of difference in mean CARs between the four categories by matching method.

Table 3.3 presents the mean monthly calendar-time abnormal returns. Estimating the three factor model of Fama and French, we find that the alpha for the debt repayment group is -0.99% and statistically significant at the 5% level. However, alphas for the other groups are not statistically significant, confirming that debt payment as the intended use of proceeds is associated with significantly poorer long-run stock performance for IPO firms. Furthermore, results in Tables 3.2 and 3.3 confirm that firms specifying investment as the primary use of proceeds exhibit insignificant negative abnormal returns. We find, however, mixed results for the marketing and sales promotion and general corporate purposes groups. While CAR analysis shows indeed significant negative abnormal returns, there is no evidence of significant long-run underperformance using calendar-time analysis.

In Table 3.4, we report the results of the multivariate regression analysis based on the following model:

$$CAR^{i}_{0,36\ months} = \alpha + \beta_1 DEBT_i + \beta_2 INVEST_i + \beta_3\ GENERAL_i + \beta_4 SALES_i + \beta_5\ Proceeds_i + \beta_6\ VCbacked_i + \beta_7\ Underpricing_i + \beta_8 Prestige_i + \beta_9\ Bubble_i + \beta_{10} SEO_i + \beta_{11} Leverage_i + \beta_{12} R\&D_i + \beta_{13} CAPEX_i + \beta_{14} ADVERT_i + \varepsilon_i \quad (2)$$

The dependent variable is the cumulative abnormal return calculated from month 1 to month 36 following the IPO date using the PSM matching method. The key parameter of interest are coefficients on four variables: (1) *DEBT* is a dummy variable that takes the value of 1 if the stated use of proceeds is debt repayment and 0 otherwise; (2) *INVEST* is a dummy variable that takes the value of 1 if the intended use of proceeds is investment plans and 0 otherwise; (3) *GENERAL* is a dummy that takes the value of 1 if the intended use of proceeds is general corporate purposes and 0 otherwise; and (4) *SALES* is a dummy that takes the value of 1 if the intended use of proceeds is marketing and sales promotion. *Proceeds* is the natural log of the total capital raised at the time of the IPO. *VC backed* is a dummy taking the value of one if the IPO is backed by a venture capital firm and zero otherwise. *Underpricing* is the price run-up in the first trading day after the IPO and is defined as the difference between the first day closing price and the offer price given as a percentage of the offer price. *Prestige* is a dummy variable that takes the value of 1 if the IPO's underwriter is in the top tier, and zero otherwise, using the rankings of Loughran and Ritter (2004). *Bubble* is a dummy variable that takes the value of 1 if the IPO occurred during 1999-2000 and zero otherwise. *SEO* is a dummy variable that takes the value of 1 if the firm conducts seasoned equity offerings in the three years following the IPO, and zero otherwise. *Leverage* is total long term debt prior the offering scaled by total assets prior the offering. *R&D* measures research and development intensity prior the offering calculated as R&D expenses to total assets. *CAPEX* measures capital expenditure intensity prior the offering calculated as capital expenditures expenses to total assets. *ADVERT* measures advertising expenses intensity prior the offering calculated as total advertising expenses to total assets.

Our results show that debt payment stated as the intended use of proceeds is one of the driver for the IPO long-run underperformance. Specifically, we find that citing debt payment in the IPO prospectus as the intended use of proceeds lowers the abnormal returns by almost 33%. Meanwhile, stating investment as the use of proceeds seems to have no statistical significant effect on IPO long-run underperformance which is consistent with our univariate results. In examining the influence of IPO-related characteristics, we find that IPO underpricing is negatively and significantly related to the long-run stock performance which is consistent with Ritter (1991). Our results also show that there is no significant difference in the long-run stock performance between venture backed and non-venture IPOs and the

prestige of the underwriter seems to have a positive but insignificant effect on IPO long-run underperformance. These latter observations must be interpreted with cautious giving our sample selection and the low level of the adjusted R-squared for this regression.

Overall, our results support the view that the market reaction is affected by the IPO's statements. The intended primary use of proceeds allows the market to assess the quality of the expected use of the capital following the offering. Our findings suggest that IPO firms that state that the intended use of proceeds is to pay down debt are associated with significant negative abnormal returns. This implies that the market could consider these firms as opportunistic market timers and consequently reacts less favorably. The insignificant negative abnormal returns identified for IPOs that state specific investment as the intended use of proceeds suggests that the market reacts favorably to firms that appear to have valuable growth prospects. When an IPO provides a vague overview for the intended use of proceeds, the market could consider that the expected capital is not being used in a value increasing manner. For instance, IPOs that state general corporate purposes as the intended use of proceeds are more likely to be opportunistic market timers than to have valuable growth opportunities.

Table 3.3 Calendar time regressions of long run stock returns

	All issuers	INVEST	DEBT	SALES	GENERAL
Alpha	-0.03	-0.15	-0.99*	0.20	0.27
	(-0.08)	(-0.35)	(-1.68)	(0.30)	(0.69)
MKT	1.26***	1.20***	1.15	1.41***	1.40***
	(17.34)	(12.81)	(8.80)	(9.57)	(15.52)
SMB	0.92***	0.97***	0.91***	0.93***	0.98***
	(5.77)	(6.83)	(5.75)	(4.34)	(5.27)
HML	-0.60***	-0.45***	0.09***	-0.83***	-1.01***
	(-4.66)	(-3.45)	(0.43)	(-3.22)	(-7.64)
Adjusted R^2	0.74	0.65	0.48	0.52	0.76

Note: Table 3.3 presents the results for Fama and French three-factor model. Monthly returns are calculated from month 1 to month 36 following the IPO. The dependent variable is the difference between monthly return on value-weighted calendar-time portfolio and monthly return on three-month Treasury bills. The independent variables are (1) MKT is the difference between the return on a value-weighted market index and the monthly return on the three-month Treasury bills; (2) SMB is the difference in the returns of value-weighted portfolios of small stocks and big stocks, and (3) HML is the difference in the returns of value-weighted portfolios of high book-to-market stocks and low book-to-market stocks. Alpha is the intercept term and represents the mean monthly excess return on the calendar-time portfolio. Coefficient estimates are displayed for all issuers and each of the four categories of intended use of proceeds: INVEST is the group of IPOs stated investment as use of proceeds. DEBT is the category of IPOs cited debt payment as intended use of proceeds, SALES is the group of IPOs declared marketing and sales promotion as use of proceeds and GENERAL is the group of IPOs stated general corporate purposes as use of proceeds. . ***, ** and * indicate statistical significance at the 0.1%, 1% and 5% level, respectively.

Table 3.4 Multivariate regressions explaining post-IPO performance

	OLS estimates			
	(1)	(2)	(3)	(4)
Constant	0.71**	0.38	0.99**	0.47
	(2.26)	(1.32)	(2.58)	(1.54)
DEBT	-0.33*		-0.37*	
	(-1.85)		(-1.74)	
INVEST	-0.20	0.12	-0.36	0.01
	(-1.14)	(0.87)	(-1.61)	(0.00)
GEENRAL	-0.20	0.13	-0.29	0.09
	(-1.23)	(0.99)	(-1.47)	(0.64)
SALES		0.33*		0.27
		(1.85)		(1.49)
Underpricing	-0.24***	-0.24***	-0.28***	-0.23***
	(-3.28)	(-3.28)	(-3.05)	(-3.17)
Proceeds	-0.14**	-0.14**	-0.16**	-0.14**
	(-2.40)	(-2.40)	(-1.99)	(-2.22)
Prestige	0.11	0.11	0.07	0.07
	(0.93)	(0.93)	(0.43)	(0.55)
VC backed	-0.12	-0.12	-0.22	-0.16
	(-1.13)	(-1.13)	(-1.65)	(-1.36)
Bubble	-0.03	-0.03	-0.02	-0.07
	(-0.28)	(-0.28)	(-0.14)	(-0.58)
SEO	0.20**	0.20**	0.24**	0.20*
	(2.05)	(2.05)	(2.02)	(1.90)
Leverage			-0.17	
			(-0.65)	
R&D				0.17
				(1.33)
CAPEX				0.01***
				(6.04)
ADVERT				-0.30
				(-0.34)
Observations	437	437	294	403
Adjusted R^2	0.06	0.06	0.07	0.07

Note: The dependent variable is the cumulative abnormal return calculated from month 1 to month 36 following the IPO date using the *PSM* matching method. *DEBT* is a dummy variable that takes the value of 1 if the intended use of proceeds is debt payment, and zero otherwise. *INVEST* is a dummy variable that takes the value of 1 if IPO firms cite investment as intended use of proceeds. *GENERAL* is a dummy variable that takes the value of 1 if the intended use of proceeds is general corporate purposes. *SALES* is a dummy variable that takes the value of 1 if the intended use of proceeds is marketing and sales promotion, and zero otherwise. *Proceeds* are defined as the natural logarithm of the capital raised at the time of the IPO. *VC backed* is a dummy variable that takes the value of 1 if the IPO is backed by a venture capital firm, and zero otherwise. *Underpricing* is 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. *Prestige* is a dummy variable that takes the value of one if the IPO's underwriter is in the top tier, and zero otherwise. *Bubble* is a dummy variable that takes the value of 1 if the IPO occurred during 1999-2000, and zero otherwise. SEO is a dummy variable that takes the value of 1 if the firm conducts seasoned equity offerings in the three years following the IPO, and zero otherwise. Leverage is total long term debt prior the offering scaled by total assets prior the offering. R&D measures research and development intensity prior the offering calculated as R&D expenses to total assets. CAPEX measures capital expenditure intensity prior the offering calculated as capital expenditures expenses to total assets. ADVERT measures advertising expenses intensity prior the offering calculated as total advertising expenses to total assets. For each independent variable, coefficient estimates and the corresponding robust t statistics are reported. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

3.5.2 Long-run operating performance

In Table 3.5 and 3.6, we examine changes in the operating performance of IPO firms. Specifically, in Table 3.5, we present results for unadjusted and industry-adjusted operating performance measured by operating cash flow to assets and operating income to sales. We report changes for the whole sample as well as for each group of intended uses of proceeds for three periods: from the year prior to the IPO to two years following the IPO, from the IPO year to two years following the IPO, and from the IPO year to three years following the IPO. In Table 3.6, we provide the same analysis using industry and pre-IPO adjusted operating performance.

Previous IPO studies report that the operating performance of IPO firms significantly declines in the five years following the offering relative to a matched sample (Jain and Kini, 1994; Mikkelsen et al., 1997). Our results confirm indeed this finding. We find significant declines in operating performance for all issuers in the two and three years following the IPO. With regard to proceeds use categories, our results show that IPOs that state debt payment as the intended use of proceeds exhibit significant declines in their operating performance for all the periods studied. However, there is no evidence of operating performance deterioration for the investment group. We find mixed results for the SALES and GENERAL categories.

Table 3.5 Operating performance changes based on industry-adjusted measures

	Median changes in operating cash flow scaled by total assets			Median changes in operating income scaled by sales		
	-1 to 2	0 to 2	0 to 3	-1 to 2	0 to 2	0 to 3
All issuers						
Unadjusted	0.029***	-0.040***	-0.013***	-0.124***	-0.001***	-0.001***
Industry adjusted	0.044***	-0.025***	-0.010***	0.005***	0.008***	0.013***
Observations	682	704	676	636	676	648
INVEST						
Unadjusted	0.019*	-0.010	-0.012	0.024	0.009	0.030**
Industry adjusted	0.033**	0.004	-0.007	0.034	0.014	0.046**
Observations	142	143	146	123	130	131
DEBT						
Unadjusted	-0.034***	-0.026***	-0.024**	-0.020**	-0.016**	-0.015
Industry adjusted	-0.016***	-0.017***	-0.015**	-0.005**	-0.010**	0.001
Observations	-2.499	-4.247	-2.054	-2.176	-2.317	-0.732
	194	212	235	194	213	235
SALES						
Unadjusted	0.075***	-0.025*	0.006	-0.327***	0.115***	0.128***
Industry adjusted	0.098***	-0.013*	-0.004	0.432***	0.130***	0.143***
Observations	73	73	57	67	71	56
GENERAL						
Unadjusted	0.111***	-0.047***	-0.006	-0.180***	0.010***	0.036***
Industry adjusted	0.118***	-0.032***	-0.012	0.102***	0.027***	0.046***
Observations	273	276	238	252	262	226

Note: Table 3.5 presents unadjusted and industry-adjusted changes in operating performance in the years surrounding the IPO date using two measures: operating cash flow to total assets and operating income to sales. We obtain industry-adjusted operating performance by matching each IPO firm with firms in the same industry based on two-digit SIC code. We compute industry-adjusted change in operating performance of an IPO firm as the difference between its change in operating performance and the median change in operating performance of all firms in its industry. Results are reported for all issuers and each of the four categories of intended use of proceeds: INVEST if IPOs cite investment as use of proceeds, DEBT if IPOs state debt payment as intended use of proceeds, SALES if marketing and sales promotion is the intended use of proceeds and GENERAL if IPOs cite general corporate purposes as intended use of proceeds. Wilcoxon signed rank test is used to examine whether the change is significantly different from zero. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table 3.6 Operating performance changes based on industry and pre- IPO performance adjusted measures

	Median changes in operating cash flow scaled by total assets			Median changes in operating income scaled by sales		
	-1 to 2	0 to 2	0 to 3	-1 to 2	0 to 2	0 to 3
All issuers						
Unadjusted	-0.009***	-0.030***	-0.007***	0.001***	-0.010***	-0.010***
Industry\ pre performance adjusted	-0.027***	-0.037***	-0.013***	-0.009***	-0.017***	-0.014***
Observations	606	605	498	552	522	444
INVEST						
Unadjusted	0.017	0.004	0.011	0.005	-0.005	-0.011
Industry\ pre performance adjusted	-0.010	-0.012	-0.003	-0.007	-0.013	-0.025
Observations	111	111	93	96	92	81
DEBT						
Unadjusted	-0.034***	-0.023***	-0.015	-0.009***	-0.001***	-0.014***
Industry\ pre performance adjusted	-0.035***	-0.027***	-0.021	-0.012***	-0.017***	-0.015***
Observations	224	223	188	224	206	181
SALES						
Unadjusted	0.036	-0.009	0.033	0.049	0.032	0.044
Industry\ pre performance adjusted	0.019	-0.023	0.008	0.030	0.029	0.064
Observations	53	53	45	42	44	37
GENERAL						
Unadjusted	0.036***	-0.050***	-0.009	0.028**	-0.001***	0.009
Industry\ pre performance adjusted	0.011***	-0.049***	0.004	-0.004**	-0.017***	-0.018
Observations	218	218	172	190	180	145

Note: Table 3.6 presents unadjusted and industry and pre IPO performance adjusted changes in operating performance in the years surrounding the IPO date using two measures: operating cash flow to total assets and operating income to sales We obtain industry and pre-IPO performance adjusted operating performance by matching each IPO firm with the control firm in the same industry based on two-digit SIC code and the closed prior IPO operating performance. We compute industry and pre-performance-adjusted change in operating performance of an IPO firm as the difference between its change in operating performance and the change in operating performance of the matched firm. Results are reported for all issuers and each of the four categories of intended use of proceeds: INVEST if IPOs cite investment as use of proceeds, DEBT if IPOs state debt payment as intended use of proceeds, SALES if marketing and sales promotion is the intended use of proceeds and GENERAL if IPOs cite general corporate purposes as intended use of proceeds. Wilcoxon signed rank test is used to examine whether the change is significantly different from zero. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively

Further, we investigate changes in post-IPO operating performance using a quantile regression and OLS estimation where the dependent variable ($\Delta(Y)$) is either change in industry-adjusted operating cash flow to assets or operating income to sales, both from the year prior to the IPO to two years following the issue. Table 3.7 reports estimation results for the following regression:

$$\Delta(Y)_i = \alpha + \beta_1 DEBT_i + \beta_2 INVEST_i + \beta_3\, GENERAL_i + \beta_4 SALES_i + \beta_5\, Proceeds_i + \beta_6\, VCbacked_i + \beta_7\, Underpricing_i + \beta_8\, Prestige_i + \beta_9\, Bubble_i + \beta_9\, Bubble_i + \beta_{10} SEO_i + \beta_{11} Leverage_i + \beta_{12} R\&D_i + \beta_{13} CAPEX_i + \beta_{14} ADVERT_i + \varepsilon_i \quad (3)$$

Our results show that the coefficient of the variable *DEBT* is negative and statistically significant for all models, indicating that IPOs that state debt payment as the intended use of proceeds present greater declines in their post-IPO operating performance. When the intended use of proceeds is investments, our results show no significant effect on post-IPO operating performance. We also find a negative but insignificant relationship between the long-run operating performance and general corporate purposes stated as the intended use of proceeds, while we find a positive relationship between the long-run operating performance and marketing and sales promotion stated as use of proceeds. Overall, these results are consistent with our earlier univariate analysis findings. With regard to IPO characteristics, Table 3.7 shows that venture backed IPOs exhibit significantly higher post-IPO operating performance than do non-venture backed IPOs. Underwriter prestige also seems to be positively and significantly related to the post-IPO operating performance. Further, we find that issuing stocks during bubble period affects positively and significantly the post-IPO operating performance.

Table 3.7 Multivariate regression analysis of operating income changes

Panel A: Quantile regression								
	Industry-adjusted operating cash flow to assets				Industry-adjusted operating income to sales			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Constant	0.04	-0.05	0.02	-0.18	0.21**	-0.02	0.31***	-0.09
	(0.49)	(-0.84)	(0.31)	(-1.11)	(2.22)	(-0.19)	(4.29)	(-0.61)
DEBT	-0.09*		-0.09*		-0.23***		-0.29***	
	(-1.93)		(-1.74)		(-3.70)		(-6.01)	
INVEST	-0.07	0.02	-0.08	-0.10	-0.22***	0.00	-0.30***	-0.10
	(-1.43)	(0.61)	(-1.51)	(-1.21)	(-3.52)	(0.10)	(-5.88)	(-1.28)
GENERAL	-0.03	0.06*	-0.06	-0.03	-0.17***	0.05	-0.27***	0.01
	(-0.73)	(1.77)	(-1.20)	(-0.40)	(-2.98)	(1.31)	(-5.74)	(0.22)
SALES		0.09*		-0.01		0.23***		0.23**
		(1.93)		(-0.12)		(3.70)		(2.54)
Underpricing	0.06***	0.06***	0.05*	-0.03	0.03	0.03	-0.05**	-0.00
	(2.79)	(2.79)	(1.91)	(-0.89)	(1.04)	(1.04)	(-2.10)	(-0.19)
Proceeds	-0.01	-0.01	-0.01	0.02	-0.02	-0.02	-0.02	-0.03
	(-0.67)	(-0.67)	(-0.37)	(0.42)	(-0.92)	(-0.92)	(-1.38)	(-0.77)
Prestige	0.00	0.00	0.01	-0.05	0.07	0.07	0.06*	0.15**
	(0.11)	(0.11)	(0.42)	(-0.76)	(1.55)	(1.55)	(1.91)	(2.53)
VCbacked	0.10***	0.10***	0.14***	-0.02	0.05	0.05	0.09***	0.02
	(3.84)	(3.84)	(4.93)	(-0.41)	(1.41)	(1.41)	(3.27)	(0.37)
Bubble	0.07**	0.07**	0.07**	0.19***	0.05	0.05	0.08***	0.13***
	(2.38)	(2.38)	(2.15)	(3.38)	(1.26)	(1.26)	(2.62)	(2.63)
SEO	0.05*	0.05*	0.04	0.09*	0.05	0.05	0.07**	0.11**
	(1.88)	(1.88)	(1.41)	(1.72)	(1.48)	(1.48)	(2.58)	(2.30)
R&D				0.89***				0.38***
				(39.24)				(6.63)
CAPEX				0.90***				-0.03
				(2.80)				(-0.09)
ADVERT				-0.14				0.23
				(-0.18)				(0.38)
Leverage			-0.01				-0.04	
			(-0.35)				(-1.04)	
Pseudo R^2	0.05	0.04	297	0.19	0.01	0.01	0.02	0.02
Observations	427	427	0.02	262	417	417	306	254

Table 3.7 (continued)

Panel B: OLS regression								
	Industry-adjusted operating cash flow to assets				Industry-adjusted operating income to sales			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Constant	0.19	0.03	0.10	0.02	0.76	-0.18	1.12	-1.51
	(1.60)	(0.39)	(0.75)	(0.13)	(0.97)	(-0.37)	(1.17)	(-1.25)
DEBT	-0.16*		-0.17**		-0.94*		-1.18*	
	(-1.84)		(-1.97)		(-1.80)		(-1.75)	
INVEST	-0.09	0.07	-0.15	0.00	-0.96	-0.02	-1.09	-0.27
	(-0.90)	(1.44)	(-1.63)	(0.05)	(-1.57)	(-0.07)	(-1.39)	(-0.54)
GENERAL	-0.09	0.07*	-0.12	-0.00	-0.77	0.17	-1.49**	0.09
	(-0.99)	(1.77)	(-1.42)	(-0.02)	(-1.43)	(0.71)	(-2.19)	(0.26)
SALES		0.16*		0.05		0.94*		0.76
		(1.84)		(0.41)		(1.80)		(1.10)
Underpricing	0.04	0.04	0.03	0.02	0.04	0.04	-0.12	-0.06
	(1.05)	(1.05)	(0.54)	(0.60)	(0.24)	(0.24)	(-0.37)	(-0.36)
Proceeds	-0.02	-0.02	-0.00	0.00	-0.01	-0.01	-0.03	0.30
	(-0.75)	(-0.75)	(-0.13)	(0.03)	(-0.09)	(-0.09)	(-0.18)	(1.06)
Prestige	-0.05	-0.05	-0.03	-0.12*	0.27	0.27	0.33	0.14
	(-0.98)	(-0.98)	(-0.56)	(-1.66)	(0.86)	(0.86)	(0.93)	(0.28)
VCbacked	.14***	0.14***	0.21***	0.10*	0.40	0.40	0.71**	0.13
	(3.43)	(3.43)	(4.27)	(1.84)	(1.62)	(1.62)	(2.44)	(0.35)
Bubble	0.12***	0.12***	0.15***	0.21***	0.21	0.21	0.29	0.49
	(2.61)	(2.61)	(2.70)	(3.49)	(0.84)	(0.84)	(1.02)	(1.36)
SEO	0.04	0.04	-0.01	0.06	0.21	0.21	0.12	0.44
	(0.92)	(0.92)	(-0.18)	(1.11)	(0.83)	(0.83)	(0.48)	(1.16)
R&D				0.08***				1.68**
				(3.31)				(2.27)
CAPEX				0.99***				-1.10
				(3.59)				(-0.47)
ADVERT				-0.34				2.68
				(-0.46)				(0.99)
Leverage			0.08				-0.36	
			(1.06)				(-0.76)	
Adjusted R^2	0.11	0.11	0.14	0.17	0.04	0.04	0.07	0.08
Observations	427	427	297	262	417	417	306	254

Note: The dependent variable is changes in industry- adjusted operating performance measured by operating cash flow to total assets or operating income to sales from the year prior IPO to two years after the offering. industry-adjusted change in operating performance of an IPO firm is the difference between its change in operating performance and the median change in operating performance of all firms in its industry(based on two-digit SIC code).). *DEBT* is a dummy variable that takes the value of 1 if the intended use of proceeds is debt repayment, and zero otherwise. *INVEST* is a dummy variable that takes the value of 1 if IPO firms cite investment as intended use of proceeds. *GENERAL* is a dummy variable that takes the value of 1 if the intended use of proceeds is general corporate purposes. *SALES* is a dummy variable that takes the value of 1 if the intended use of proceeds is marketing and sales promotion, and zero otherwise See Table 4 for other variable definitions. For each independent variable, coefficient estimates and the corresponding robust t statistics are reported. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

3.5.3 Robustness test: IPO survival profile

In this section, we complement our long-run performance analysis by examining whether intended use of proceeds affects the survival profile of IPO firms. We first plot the survival function of our IPO sample by intended use of proceeds category. Figure 3.1 provides five years plot of the survival function using Kaplan Meier estimator. We find that IPO firms stating debt payment as intended use of proceeds have lower survival profile compared to other categories and that IPOs stating investment as intended use of proceed seem to have the highest probability of survive.

Next, we run multivariate hazard regressions using the proportional hazards model proposed by Cox (1972)[20]. The basic model assumes the following form:

$$h_i(t) = \lambda_0(t)\exp\{\beta_1 x_{i1} + ... + \beta_k x_{ik}\} \quad (4)$$

Where hi(t) is the conditional failure rate defined as the probability of failure during the five years following the IPO. $\lambda_0(t)$ is the baseline hazard function and the second part of the equation is the exponentiated set of covariates for firm i.

The regression model is as follows:

$$Y = \alpha + \beta_1 DEBT_i + \beta_2 INVEST_i + \beta_3\ GENERAL_i + \beta_4 SALES_i + \beta_5\ Proceeds_i + \beta_6\ VCbacked_i + \beta_7\ Underpricing_i + \beta_8\ Prestige_i + \beta_9\ Bubble_i + \beta_{10} SEO_i + \beta_{11} Leverage_i + \beta_{12} R\&D_i + \beta_{13} CAPEX_i + \beta_{14} ADVERT_i + \varepsilon_i \quad (5)$$

Table 3.8 reports the survival analysis results for regression (5). We find that the probability of failure significantly increases when the intended use of proceeds is debt payment. This result is robust for controlling the level of leverage prior the offering. Specifically, our results show that stating debt payment as use of proceeds increases the risk of failure during the five years following IPO by about 90% (1- $e^{0.65}$). We also find a negative

[20] 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.

of failure during the five years following IPO by about 90% (1- $e^{0.65}$). We also find a negative relationship between the probability of failure and investment as stated use of proceeds, suggesting that firms stated investment as intended use of proceeds are less likely to fail during the five years following the IPO, although this relationship is not significant. With regard to IPO characteristics, we find a negative and significant relationship between the probability of failure and total proceeds, suggesting that IPO firms raising higher amount of proceeds are more likely to survive in the five years following the IPO.

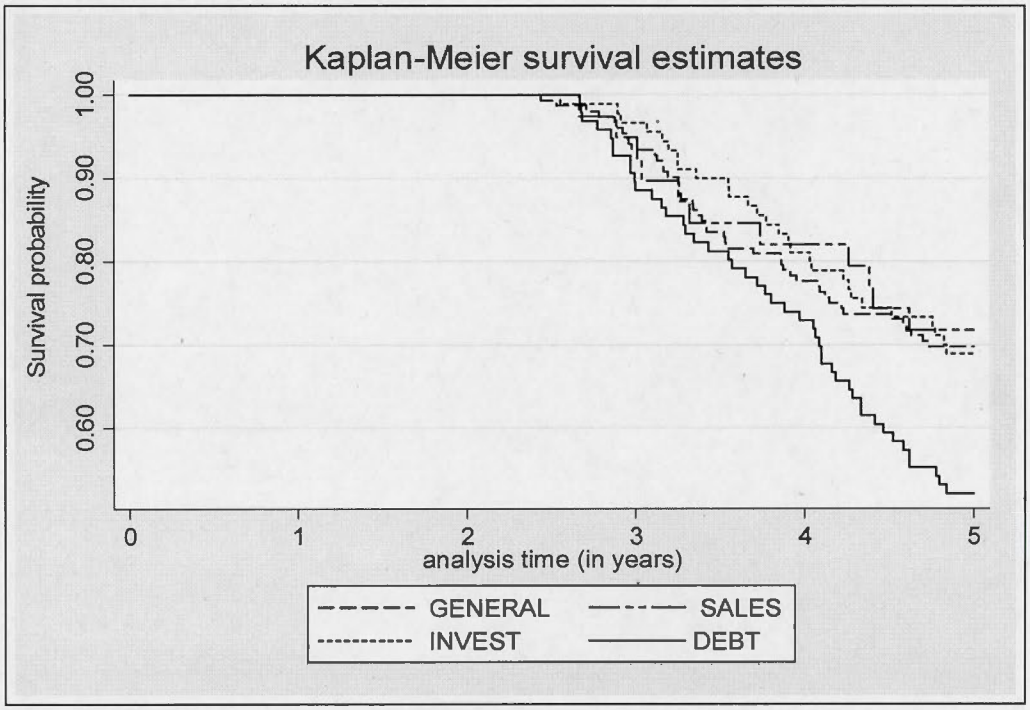

Figure 3.1 Survival functions

Table 3.8 Multivariate Cox Hazard regression

	Cox model estimates			
	(1)	(2)	(3)	(4)
DEBT	0.76**	0.65***	0.76*	0.65***
	(2.19)	(2.70)	(1.70)	(2.71)
INVEST	-0.00	-0.11	0.07	-0.16
	(-0.01)	(-0.41)	(0.15)	(-0.55)
GENERAL	0.11		0.15	
	(0.32)		(0.35)	
SALES		-0.11		-0.11
		(-0.32)		(-0.32)
Underpricing	0.07	0.07	-0.01	0.07
	(0.56)	(0.56)	(-0.07)	(0.57)
Proceeds	-0.18	-0.18	-0.23*	-0.18
	(-1.59)	(-1.59)	(-1.80)	(-1.53)
Prestige	-0.10	-0.10	-0.05	-0.10
	(-0.46)	(-0.46)	(-0.17)	(-0.44)
VC backed	0.20	0.20	0.40*	0.19
	(0.98)	(0.98)	(1.70)	(0.89)
Bubble	-0.31	-0.31	-0.18	-0.32
	(-1.48)	(-1.48)	(-0.76)	(-1.50)
SEO	-0.33	-0.33	-0.32	-0.34
	(-1.56)	(-1.56)	(-1.35)	(-1.62)
Leverage			0.04	
			(0.12)	
R&D				-0.18
				(-0.51)
CAPEX				-2.29
				(-1.64)
ADVERT				-7.95*
				(-1.70)
Observations	366	366	275	366
Wald_test	25.58	25.58	18.79	30.73
Log_likelihood	-729.0	-729.0	-506.6	-725.3

Note: *DEBT* is a dummy variable that takes the value of 1 if the intended use of proceeds is debt repayment, and zero otherwise. *INVEST* is a dummy variable that takes the value of 1 if IPO firms cite investment as intended use of proceeds, and zero otherwise. *GENERAL* is a dummy variable that takes the value of 1 if the intended use of proceeds is general corporate purposes, and zero otherwise. *SALES* is a dummy variable that takes the value of 1 if the intended use of proceeds is marketing and sales promotion, and zero otherwise. See Table 4 for other variable definitions. For each independent variable, coefficient estimates and the corresponding t statistics are reported. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

3.6 Conclusion

In this paper, we hand collected data from IPO prospectus on the primary use of proceeds of IPO firms and related to their long-run stock performance, operating performance, and survival profile. Specifically, we cover the 1996-2012 period and examine four categories of proceeds use: debt payment, investment, marketing and sales promotion, and general corporate purposes. Our event time analysis shows that IPOs declaring investment plans as the primary use of proceeds exhibit lower underperformance in the three years following the IPO. A higher and significant underperformance is calculated when the primary use of proceeds is debt payment or general corporate purposes. Our calendar time regression of the three factor model confirms that underperformance is higher still when debt payment is the intended use of proceeds. Using a multivariate regression, our results confirm our univariate and FF factor analysis findings.

Using two measures of IPO operating performance, we find no evidence of post-IPO performance deterioration when the stated use of proceeds is investment. However, our results show significant declines in operating performance when the issuer declares debt repayment as the intended use of proceeds. Our quantile and OLS regressions confirm these findings.

Our study provides new evidence for the role that the primary use of proceeds plays in explaining the timing motive of IPO firms. IPOs that state debt payment as the primary use of proceeds may be viewed by the market as opportunistic. This implies that these firms issue equity when their stocks are overvalued to refinance their debt. The negative market reaction to such behaviour is confirmed by our results. If IPO firms declare a specific investment as the primary use of proceeds, this implies that the capital to be raised at the offering is going to be used to maximize value. Revealing future acquisitions, R&D projects, or capital expenditure purposes as the primary use of proceeds may be seen as a positive signal regarding an IPO's growth prospects. Consequently, the market reacts favourably. Our results also support this evidence. We test the robustness of our finding by examining whether intended use of proceeds affects the survival profile of IPO firms and find that stating debt

payment as use of proceeds increases the risk of failure during the five years following IPO by about 90%.

REFERENCES

Aggarwal, R., Rivoli, P., 1990. Fads in the initial public offering market? Financial Management 22, 42-53.

Amihud, Y., 2002. Illiquidity and stock returns: Cross-section and time-series effects. Journal of Financial Markets 5, 31–56.

Autore, Don M., Bray, D.E., Peterson, D.R., 2009. Intended use of proceeds and the long-run performance of seasoned equity issuers. Journal of Corporate Finance 15, 358-367.

Baker, M., Wurgler, J., 2002. Market timing and capital structure. Journal of Finance 57, 1–32.

Barber, B.M., Lyon, J.D., 1996. Detecting abnormal operating performance: the empirical power and specification of test statistics, Journal of Financial Economics 41, 359–399.

Bessembinder, H., Zhang, F., 2013. Firm's characteristics and long-run stock returns after corporate events. Journal of Financial Economics 109, 83-102.

Brau, J. C., Fawcett, S.E., 2006. Initial public offerings: An analysis of theory and practice. Journal of Finance 61, 399-436.

Brav, A., Gompers, P., 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., Geczy, C., Gompers, P., 2000. Is the abnormal return following equity issuance anomalous? Journal of Financial Economics 56, 209–249.

Eckbo, B. E., Masulis, R.W., Norli, O., 2007. Security Offerings, Chap 6 of Handbook of Corporate Finance, Volume 1, Edited by B. Espen Eckbo, Elsevier.

Fama, E. F., French, K.R., 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 43, 3-56.

Jain, B.A., Kini, O., 1994. The post issue operating performance of IPO firms. Journal of Finance 49, 1699-1726.

Jeanneret, P., 2005. Use of proceeds and long-term performance of French SEO firms. European Financial Management 11, 99–122.

Kim, W., Weisbach, M.S., 2008. Motivations for public equity offers: an international perspective. Journal of Financial Economics 87, 281–307.

Leone, A.J., Rock, S., Willenborg, M., 2007. Disclosure of intended use of proceeds and underpricing in initial public offerings. Journal of Accounting Research 45, 111–153.

Loughran, T., Ritter, J., 2004. Why has IPO underpricing changed over time? Financial Management 33, 5- 37.

Loughran, T., Ritter, J., 1995. The new issues puzzle. Journal of Finance 50, 23–51.

Lyon, J.D., Barber, B.M., Tsai, C., 1999. Improved methods for tests of long-run abnormal stock returns. Journal of Finance 54, 165-201.

Miller, E., 1977. Risk, uncertainty and divergence of opinion. Journal of Finance 32, 1151–1168.

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

Pagano, M., Panetta, F., Zingales, L., 1998. Why do companies go public? An Empirical Analysis. Journal of Finance 53, 27-64.

Ritter, J., 1991. The long-run performance of initial public offerings. Journal of Finance 46, 3-27.

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

Rosenbaum, P. R., Rubin, D.B., 1983. The Central role of the propensity score in observational studies for Causal Effects. Biometrika 70, 41-55.

Schultz, P., 2004. Pseudo market timing and the long-run underperformance of IPOs. Journal of Finance 58, 199-229.

Walker, M., Yost, K., 2008. Seasoned equity offerings: what firms say, do, and how the market reacts. Journal of Corporate Finance 14, 376–386.

CONCLUSION GÉNÉRALE

L'introduction en bourse demeure une décision stratégique dans la vie d'une entreprise. Cet évènement a suscité l'intérêt de nombreux chercheurs qui ont tenté essentiellement à expliquer la performance des titres nouvellement introduits sur un horizon à court, à moyen et à long terme.

Partant du constat que la création d'une valeur au marché des titres nouvellement émis présente un levier financier pour s'engager dans des opérations de fusions et acquisitions futures (Brau et al., 2006), la littérature financière s'est intéressée à l'examen des déterminants des opérations de fusion-acquisition et de comprendre les motivations et les conséquences des entreprises introduites en bourse via des émissions initiales. Cette thèse se situe dans ce nouveau courant de littérature où les recherches empiriques restent limitées. Nous proposons d'explorer la relation entre l'introduction en bourse et les opérations de fusion-acquisition. Il comporte trois chapitres, visant chacune des objectifs spécifiques et se fondant sur une méthodologie propre.

L'objectif du premier chapitre est d'examiner la relation entre certaines caractéristiques liées à l'introduction en bourse et la probabilité qu'une entreprise nouvellement introduite en bourse s'engage dans une opération de fusion-acquisition durant les cinq premières années subséquentes à l'introduction en bourse. Nos résultats montrent une relation positive et significative entre la probabilité de faire une acquisition durant les cinq années après l'émission et le degré de changement du pourcentage d'actions détenues par les initiés. Nous concluons que plus ce changement est important, plus les entreprises introduites en bourse s'engagent dans des acquisitions. De plus, la présence d'un spécialiste en capital de risque dans le processus d'introduction en bourse a un effet positif et significatif sur la probabilité qu'une entreprise effectue des opérations de fusion-acquisition post-émission. Nous constatons aussi que les spécialistes en capital de risque tentent à éviter les acquisitions durant la période de blocage des fonds. Les tests empiriques sur le choix de mode de paiement des opérations de fusion-acquisition post-émission montrent l'importance de tenir

compte de l'asymétrie d'information entre la cible et l'entreprise émettrice. Plus particulièrement, la présence d'information asymétrique fait réduire la probabilité que l'entreprise acquéreuse puisse profiter de ses actions surévaluées pour payer ses opérations d'acquisition. Nos résultats montrent aussi qu'il existe une relation positive entre le nombre d'investisseurs institutionnels communs entre les deux entreprises acquéreuse et cible et la probabilité que les acquisitions soient payées par les actions. Nos tests empiriques révèlent aussi que le degré de sous-évaluation initiale, les émissions subséquentes d'actions et le degré de changement dans la proportion des actions détenues par les initiés sont liés positivement à la probabilité qu'une entreprise introduite en bourse réalise plus que deux opérations d'acquisition durant les 5 ans post-émission.

L'objectif du deuxième chapitre est de réexaminer l'impact des opérations d'acquisition réalisées dans la première année post-cotation sur la performance à long terme des entreprises introduites en bourse en comparant les entreprises qui ont effectué une seule acquisition à celles qui se sont engagées dans une série d'acquisitions. Nous proposons aussi d'examiner l'impact de ces acquisitions sur la survie des entreprises dans les cinq années subséquentes à l'introduction en bourse. Nos tests empiriques montrent que le rendement anormal cumulé moyen à long terme des entreprises introduites en bourse qui ont effectué plusieurs acquisitions une année après l'émission est plus faible que le rendement anormal des entreprises réalisant seulement une acquisition. Par exemple, le rendement anormal moyen cumulé sur 3 ans des entreprises qui ont effectué plusieurs acquisitions durant la première année après émission est de -26,23% (ajusté aux rendements de marché) comparé à -2.71% pour les entreprises effectuant seulement une acquisition. Nos résultats montrent aussi que les entreprises qui continuent le processus d'acquisition après la première année après émission ont pu atténuer le problème de la forte sous-performance à long terme. Notre étude de survie révèle que la probabilité de non-survie après introduction en bourse augmente avec le nombre d'acquisitions réalisées durant la première année après émission.

L'objectif du troisième chapitre est d'explorer l'effet de l'utilisation prévue des fonds levés à l'introduction en bourse sur la performance financière et opérationnelle de l'entreprise cotée. Bien que la diffusion de l'information sur l'utilisation prévue des fonds ait une grande importance pour les investisseurs, aucune étude empirique, à notre connaissance, n'a tenté

d'évaluer son effet sur la santé financière et économique de l'entreprise. Nos tests empiriques montrent que les entreprises qui annoncent que les fonds levés vont être utilisés pour investir en projets de croissance à travers des opérations d'acquisition, des projets de recherche et développement ou des dépenses d'investissement du capital ont réalisé la plus grande performance financière à long terme. Par contre, celles qui ont déclaré que les fonds seront utilisés pour payer une partie de la dette ont la plus faible performance à long terme. Ces résultats suggèrent que le marché pourrait réagir défavorablement aux entreprises qui montrent leur intérêt à utiliser les fonds levés pour payer les dettes en les considérant comme des opportunistes qui ont choisi de s'introduire en bourse dans des périodes de forte hausse de marché pour assainir leur structure financière. Nos résultats montrent aussi qu'il n'y a pas une dégradation significative de la performance opérationnelle à long terme lorsque l'entreprise déclare qu'elle va utiliser ses fonds levés pour investir. Cependant, nous observons un déclin significatif de la performance si l'utilisation prévue des fonds levés est le paiement de la dette.

La motivation des émissions initiales d'actions reste une problématique de recherche importante. Plusieurs questions méritent encore d'être explorées. Par exemple, nous avons examiné l'effet de l'utilisation prévue des fonds levés à l'introduction en bourse sur la performance financière et opérationnelle de l'entreprise cotée. Il serait intéressant dans ce contexte de comparer l'utilisation réelle des fonds par rapport à l'utilisation prévue avant l'émission et d'analyser si les entreprises émettrices respectaient leurs engagements et d'examiner l'impact de cet écart sur la performance financière. Récemment, Gao et al. (2014) ont constaté que le nombre des introductions en bourse a diminué considérablement depuis les années 2000. Il serait ainsi intéressant d'étudier les raisons de cette baisse et de vérifier si c'est un phénomène particulier au marché des introductions en bourse aux États-Unis.

RÉFÉRENCES

Aggarwal, R., Rivoli, P., 1990. Fads in the initial public offering market? Financial Management 22, 42-53.

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

Aktas, N., de Bodt, E., Roll, R., 2009. Learning, hubris and corporate serial acquisitions. Journal of Corporate Finance 15, 543-561.

Aktas, N., de Bodt, E., Roll, R., 2011. Serial acquirer bidding: An empirical test of the learning hypothesis, Journal of Corporate Finance 17, 18-32.

Aktas, N., de Bodt, E., Roll, R., 2013. Learning from repetitive acquisitions: Evidence from the time between deals. Journal of Financial Economics 108, 99-117.

Amihud, Y., 2002. Illiquidity and stock returns: Cross-section and time-series effects. Journal of Financial Markets 5, 31–56.

Antoniou, A., Zhao, H., 2004. Long run post takeover stock return: the impact of overlapping return, takeover premium and method of payment. Working paper

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

Arthurs, J.D., Busenitz, L.W., Hoskisson, R.E., Johnson, R.A., 2009. Signaling and initial public offerings: The use and impact of the lockup period. Journal of Business Venturing 24, 360-372.

Autore, Don M., D.E. Bray, and D. R. Peterson., 2009. Intended use of proceeds and the long-run performance of seasoned equity issuers. Journal of Corporate Finance 15, 358-367.

Baker, M., Wurgler, J., 2002. Market timing and capital structure. Journal of Finance 57, 1–32.

Barber, B.M., Lyon, J.D., 1996. Detecting abnormal operating performance: the empirical power and specification of test statistics. Journal of Financial Economics 41, 359–399.

Barry, C., Muscarella, C., Peavy, J.,Vetsuypens, M., 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., Stegemoller, M., 2009. Corporate governance structure and the value of acquisition activity. Working paper.

Bessembinder, H., Zhang, F., 2013. Firms characteristics and long-run stock returns after corporate events. Journal of Financial Economics 109, 83-102.

Bhushan, R., 1989. Firm characteristics and analyst following. Journal of Accounting and Economics 11, 255–274.

Billett, M. T., Qian, Y., 2008. Are overconfident CEOs born or made? Evidence of self-attribution bias from frequent acquirers. Management Science 54, 1037-1051.

Boubakri, N., Kooli, M., L'Her, J.F., 2005. Is there any life after going public? Evidence from the Canadian market. The Journal of Private Equity 8, 30-40.

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

Brau, J. C.; Francis, B., Kohers, N., 2003. The choice of IPO versus takeover: Empirical evidence. Journal of Business 76, 583-612.

Brau, J., Fawcett, S., 2006. Initial Public Offerings: An analysis of theory and practice. Journal of Finance 61, 399-436.

Brau, J. C., Couch, R.B., Sutton, N.K., 2012. The desire to acquire and IPO long-run underperformance. Journal of Financial and Quantitative Analysis 47, 493-510.

Brav, A., Gompers, P., 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., Gompers, P.A., 1999. Insider trading subsequent to initial public offerings: Evidence from expirations of lock-up provisions. Working paper.

Brav, A., Geczy, C., Gompers, P., 2000. Is the abnormal return following equity issuance anomalous? Journal of Financial Economics 56, 209–249.

Carter, R., Dark, F., Singh, A., 1998. Underwriter reputation, initial returns, and the long-run performance of IPO stocks. The Journal of Finance 53, 285-311.

Chang, S., 1998. takeovers of privately held targets, methods of payment, and bidder returns. Journal of Finance 53(2), 773–784.

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

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

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

Cox, D. R., 1972. Regression models and life tables. Journal of the Royal Statistical Society 34, 187-220.

Dong, M., Michel, J.S., Pandes, J.A., 2011. Underwriter quality and long-run IPO performance. Financial Management 40, 219-251.

Fama, E. F. and K.R. French, 1993. Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 43, 3-56.

Fama, Eugene F., 1998. Market efficiency, long-term returns, and behavioral finance. Journal of Financial Economics 49, 283-306.

Fangjian F., Leming, l., Micah S., O., 2013. Acquisitions driven by stock overvaluation: Are they good deals? Journal of Financial Economics 109, 24-39.

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

Gao, N., Jain, B., 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.

Gu, F., Lev, B., 2011. Overpriced shares, ill-advised acquisitions, and goodwill impairment. Accounting Review 86, 1995–2022.

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

Harford, J., Li, K., 2007. Decoupling CEO wealth and firm performance: the case of acquiring CEOs. Journal of Finance 62, 917–949.

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

Heckman, J., 1979. Sample selection bias as a specification error. Econometrica 47, 153–161.

Hensler, D., Springer, T., Rutherford, R., 1997. The survival of initial public offerings in the aftermarket. The Journal of Financial Research 1, 93-110.

Hongjun, Z., Xianjie, H., Lin, L., 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., Hutton, I., 2010. Merger-motivated IPOs. Financial Management 39, 1547–1573.

Hsieh, J., Lyandres, E., Zhdanov, A., 2011. A Theory of merger-driven IPOs. Journal of Financial and Quantitative Analysis 46, 1367–1405.

Hsuan-Chi, C., C. Sheng-Syan, and H. Chia-Wei, 2012. Why do insiders sell shares following IPO lockups? Financial Management 41, 813-847.

Ismail, Ahmad, 2008. Which acquirers gain more, single or multiple? Recent evidence from the USA market. Global Finance Journal 19, 72-84.

Jain, B.A., Kini, O., 1994. The post issue operating performance of IPO firms, Journal of Finance 49, 1699-1726.

Jain, B., Kini, O., 1999. The life cycle of IPO firms. Journal of Business Finance and Accounting 26, 1281-1307.

Jain, B., Kini, O., 2000. Does the presence of venture capitalists improve the survival profile of IPO firms? Journal of Business Finance and Accounting 27, 1139-1176.

Jeanneret, P., 2005. Use of proceeds and long-term performance of French SEO firms. European Financial Management 11, 99–122.

Jensen, M., Meckling, W., 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.

Kim, W., Weisbach, M.S., 2008. Motivations for public equity offers: an international perspective. Journal of Financial Economics 87, 281–307.

Kooli, M., Meknassi, S., 2007. The survival profile of U.S. IPO issuers 1985-2005. The Journal of Wealth Management 10, 105-119.

Krishnan, C.N.V., Ivanov, V.I., Masulis, R.W., Singh, A.K., 2011. Venture capital reputation, post-IPO performance and corporate governance. Journal of Financial and Quantitative Analysis 46, 1295-1333.

Kuntara P.L., Nikhil, V., 2007. IPO pricing, block sales and long-term performance. The Financial Review 42, 319-348.

Leone, A.J., S., Rock, and M., Willenborg, 2007. Disclosure of intended use of proceeds and underpricing in initial public offerings. Journal of Accounting Research 45, 111–153.

Loughran, T., Ritter, J., 1995. The new issues puzzle. Journal of Finance 50, 23–51

Loughran, T. Ritter R.J., 2004. Why has IPO underpricing changed over time? Financial Management 33, 5- 37.

Lyon, J.D., B.M., Barber, and C.,Tsai, 1999. Improved methods for tests of long-run abnormal stock returns, Journal of Finance 54, 165-201.

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

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

Miller, E., 1977. Risk, uncertainty and divergence of opinion. Journal of Finance 32, 1151–1168.

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

Mitchell, M.L., Stafford, E., 2000. Managerial decisions and long-term stock price performance. Journal of Business 73, 287–329.

Pagano, M., Panetta, F., Zingales, L., 1998. Why do companies go public? An empirical analysis. Journal of Finance 53, 27-64.

Ragozzino, R., Reuer, J.J., 2007. Initial public offerings and the acquisition of newly-public firms. Strategic Organization 5, 155-176.

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

Ritter, J., 1991. The long-run performance of initial public offerings. Journal of Finance 46, 3–27.

Ritter, J. R., Gao, X., Zhu, Z., 2013. Where Have All the IPOs Gone? Forthcoming, Journal of Financial and Quantitative Analysis.

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

Rosenbaum, P. R., Rubin, D.B., 1983. The central role of the propensity score in observational studies for causal effects. Biometrika 70, 41-55.

Roosenboom, P., Goot, T., 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.

Schultz, P.H., Zaman, M., 2001. Do the individuals closest to internet firms believe they are overvalued? Journal of Financial Economics 59, 347-381.

Shiller, R., 1990. Speculative prices and popular models. Journal of Economic perspectives 4, 55–65.

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

Shultz, P., 1993. Unit initial public offerings. Journal of Financial Economics 34, 199-229.

Teoh, S., Welch, I., Wong, T., 1998. Earnings management and the long-run market performance of initial public offerings. Journal of Finance 53, 1935–1974.

Walker, M., Yost, K., 2008. Seasoned equity offerings: what firms say, do, and how the market reacts. Journal of Corporate Finance 14, 376–386.

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