The influence of initial investor backing on post-IPO acquisition activity

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Abstract

Financial sponsors, in the form of venture capital (VC) or private equity (PE) investors, can significantly influence a firm's growth strategy. We test whether VC or PE backing at the time of a firm's IPO leads to different post-IPO acquisition strategies by using a sample of 1,341 US IPOs between 2001 and 2017 and 1,845 subsequent acquisitions by these newly public firms. We find that PE-backed newly public firms engage in almost three times as many acquisitions as VC-backed newly public firms and almost twice as many as non-backed ones. PE-backed firms are also more likely to engage in more transformative acquisitions as proxied by size, while VC-backed firms tend to increase their capex and R&D spending. Finally, we document positive short-term stock market reactions to acquisition announcements of newly public firms, but only PE-backed firms that become acquirers following their IPO achieve significant, positive post-IPO long-run stock returns. [149 words]

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1. Introduction

Going public by listing shares on a stock exchange is a crucial event in a company's life cycle. The reasons to go public can be manifold: obtaining a new (external) source of equity with a view to minimize the firm's cost of capital (Scott, 1976), being a strategic choice to broaden ownership (Chemmanur & Fulghieri, 1999), increasing analyst coverage (Bradley et al., 2003) or enabling insiders to cash out (e.g., Zingales, 1995). The most prominent reason, however, appears to be the facilitation of takeover activity. The newly issued shares can be used as a "currency" with which to either purchase other firms or to exchange when being the target in a share deal (Brau et al., 2003). In a survey of chief financial officers, Brau and Fawcett (2006) find that the desire to engage in future acquisition activity is the main motivation for firms undertaking an initial public offering (IPO). This motive may be especially prevalent for financial sponsor-backed firms, which represent a substantial share of IPOs and where the sponsor relies on monetizing its investment. While sponsors' primary concern may be the timely realization of a lucrative exit, they typically hold on to a substantial amount of their shares for some time, typically between one and three years post IPO, partly due to lock-up periods and signaling concerns (Barry et al., 1990; Dong et al., 2020; Leland & Pyle, 1977). During this post-IPO period of transitional ownership, sponsors' steering of their portfolio firms may influence whether and to what degree they engage in merger and acquisition (M&A) activity.

Despite acquisitions seemingly being a powerful driver in the decision to go public (Brau & Fawcett, 2006), the empirical evidence on this topic is still comparatively limited. Celikyurt et al. (2010) find that newly public firms conduct more acquisitions than more mature firms in the same industry, mainly by making use of their IPO proceeds and through better access to debt and equity markets. Financial sponsor backing at the time of a firm's IPO can likewise impact the firm's

future acquisition activity. Firms backed by venture capitalist (VC) investors are more likely to become acquisition targets (Anderson et al., 2017), allowing for a quick exit by the VC firm. At the same time, Anderson et al. (2017) show that the prospect of potentially being acquired also influences the propensity of VC-backed firms to become active acquirers themselves during the post-IPO period. For private equity (PE) firms, Dong et al. (2020) observe high levels of post-IPO equity stake retention in portfolio companies for periods often exceeding two years. More generally, Levis (2011) documents a significant difference in the kind of companies VC and PE firms back, with PE firms generally backing larger firms with higher sales compared to the ones VCs typically back. Additionally, he shows that in the UK, PE-backed firms' stock returns outperform their VC-backed and non-backed peers following an IPO. Given the apparent differences in the types and performance of VC- and PE-backed firms, particularly following an IPO, it stands to reason that the type of sponsor backing will also influence a firm's post-IPO acquisition activity.

In this study we investigate whether VC or PE backing at the time of a firm's IPO has a significant impact on the firm's post-IPO acquisition activity and performance. Prior research almost exclusively focuses on the impact of VC backing on post-IPO acquisition activity (Anderson et al., 2017; Celikyurt et al., 2010; Hovakimian & Hutton, 2010), with little to no evidence on the effect of PE backing or differences between VC and PE backing. VC firms mainly invest in smaller firms with strong organic growth outlooks, while PE investors focus on mature companies in stable industries. As a result of these differences, both investors deploy different strategies in creating value on a portfolio firm level, particularly when it comes to growth. It is therefore reasonable to assume that the type of financial sponsor backing, either through VC or PE investors, will lead to different post-IPO M&A strategies pursued by portfolio companies.

Analyzing a sample of 1,341 US IPOs between 2001 and 2017 and 1,845 subsequent acquisitions by these newly public firms, we find that financial sponsor backing itself as well as the type of financial sponsor backing at the time of the IPO has a meaningful impact on a firm's post-IPO M&A activity and stock market performance. Accounting for differences in firm characteristics, we find that PE-backed newly public firms outperform their VC-backed and non-backed peers in the number of post-IPO acquisitions they conduct and in the speed with which they proceed. This outperformance is significantly stronger when the leading PE firm is the majority owner. For VC-backed firms, however, we find significantly higher post-IPO capex and R&D spending. This suggests that sponsors promote growth in their newly public portfolio firms in different ways: PE sponsors focus on inorganic growth by way of acquisitions, while VC sponsors focus on realizing organic growth options through capex and R&D spending. Consistent with this pattern, our results further indicate that PE-backed IPO firms conduct larger, more transformative transactions than their peers. Our examination of the short-term stock returns reveals generally positive announcement returns to newly public acquirers, with non-backed acquirers exhibiting the highest returns. The long-run returns, however, reveal that particularly PE-backed newly public acquirers outperform their VC-backed and non-backed peers.

This study contributes to the existing literature in multiple ways. First, we document significant differences in post-IPO acquisition activity between PE-backed, VC-backed and non-backed firms. Prior studies either did not consider PE-backed companies, implicitly compared the acquisition activities of newly public VC-backed firms to those of PE- and non-backed newly public firms as if they were a homogenous group or focused either solely on the impact of VC backing on the acquisition activity of newly listed firms (Anderson et al., 2017; Celikyurt et al., 2010) or PE exits from newly listed firms (Dong et al., 2020). Differentiating by sponsor type may

also help reconcile the ambiguous findings on the impact of VC backing on post-IPO acquisition activity, which ranges from positive (Anderson et al., 2017) to neutral (Celikyurt et al., 2010) to negative (Ragozzino et al., 2018) and may be driven by some studies implicitly including PE-backed IPOs in the benchmark group of non-backed offerings. Second, we show distinct investment preferences in terms of organic versus inorganic growth between PE- and VC-backed companies in the post-IPO period. In this context we document differences in the types of acquisitions conducted post-IPO based on initial sponsor backing and find that PE-backed newly public firms conduct more transformative acquisitions in terms of the relative size of targets. Third, we add to earlier studies by substantiating the finding of generally positive bidder announcement returns to post-IPO acquisitions with evidence on return differences among backing groups. We similarly extend the prior literature on the long-run post-IPO stock performance and our finding of positive long-term returns among PE-backed newly public acquirers is contrary to the general notion that newly public firms underperform the market. Understanding the benefits and potential downsides of the different growth strategy each financial sponsor pursues has important implications for investors when deciding on portfolio allocation, particularly when looking at the difference in the short-run and long-run returns of newly public firms based on their pre-IPO ownership background.

The remainder of the paper is structured as follows. Section 2 provides a brief overview of the two main types of financial sponsors, the relevant literature and develops our main hypotheses. Section 3 presents the sample construction as well as descriptive sample statistics. Section 4 outlines our empirical approach and discusses our results. Section 5 concludes.

2. Background and research hypotheses

2.1 Financial sponsors and the sub-groups of PE and VC investors

As transitionary owners of corporations, financial sponsors buy equity stakes in firms with the intention of selling them for a profit after successfully having increased their value. More formally put, financial sponsors are defined as meeting the below criteria as put forward by Metrick and Yasuda (2011)[1]: (i) A financial sponsor is a financial intermediary, meaning that it takes the investors' capital and invests it directly in portfolio companies; (ii) a financial sponsor invests only in private companies. This means that once the investments are made, the companies cannot be immediately traded on a public exchange; [2] (iii) a financial sponsor takes an active role in monitoring and helping the companies in its portfolio; and (iv) a financial sponsor's primary goal is to maximize its financial return by exiting investments through a sale or an IPO.

Within the group of financial sponsors, the extant literature commonly differentiates two distinct types of sponsors: VC and PE investors (Buchner et al., 2019; Michala, 2019; Paglia & Harjoto, 2014). While both confirm to the definitions provided above, they differ in the kinds of firms they invest in. VC sponsors invest in young firms with strong growth potential yet considerable uncertainty regarding their future cash flows. PE sponsors, in contrast, mostly focus on mature and reasonably large companies with proven business models and a stable cash flow generation ability.

The different kinds of companies PE and VC firms invest in translate to further distinct characteristics of the two types of sponsors. One concerns the structuring of their investments.

[1] Metrick and Yasuda ((2011)) and others refer to 'private equity' as the overarching category comprising venture capital (VC) and buyout (BO) investors. While meaning the same, we refer to the overarching category as 'financial sponsors' and the subgroup of buyout (BO) investors as private equity (PE) investors. We therefore use the term 'financial sponsors' as descriptive of the overall category in the definition provided above.

[2] This does not rule out that portfolio companies are traded on public exchanges during some part of the holding period, most typically after an IPO and before a full sponsor exit.

While VC sponsors acquire minority equity stakes in early financing rounds, PE investors typically acquire controlling majority stakes which they finance with debt borrowed against the future cash flow of their new portfolio firm. Another difference concerns the economics of funds raised by both investor groups.[3] For VC funds, overall returns are typically driven by a very small number of rapidly growing 'star' firms, while almost half of a fund's portfolio firms are likely to fail altogether (Manigart et al., 2002). This is different in PE funds, where failure rates are dramatically lower yet standout performances of single portfolio firms, comparable to VC-backed 'stars', also rarely happen. Instead, through using leverage in the acquisitions of their portfolio firms, PE funds increase their returns on the upside through the paydown of debt, something that does not play a role in VC funds.

While both VC and PE sponsors are associated with making significant changes in the ways their portfolio firms operate, there are some select differences in the levers these two types of sponsors employ when it comes to value creation at the portfolio firm level. Firstly, PE sponsors have more sway in affecting change because they typically hold controlling stakes in their portfolio firms. This is sometimes associated with a more directive and in-depth involvement in all aspects of portfolio firms' operations rather than the advisory-type guidance provided by VC owners during early stages of growth (DeAngelo & DeAngelo, 1987). Illustrating this dynamic is the fact that portfolio company CEOs are rarely replaced in VC-backed portfolio firms, something that happens more regularly in PE-backed ones. Secondly, the unique challenges of the firms they back mean that PE and VC sponsors' main levers of value creation differ. For instance, for the mature

[3] Both PE and VC investors raise closed-end funds with finite lifetimes of typically 10 years. While the sponsors serve as general partners of their funds, the vast majority of capital contained in these funds is raised from so-called limited partners. For the first five years of their lifetimes, these funds are in their 'investment period', focusing on deploying capital before switching to 'harvesting mode' during which the focus gradually shifts towards exiting investments. During all stages, a considerable share of attention is devoted towards monitoring and steering of portfolio firms (Metrick and Yasuda, 2011).

and often low-growth companies that PE firms back, acquisition-induced growth is a key lever for value creation (see e.g., Greve, 2008). As a result, a large number of PE sponsors are burnishing their credentials in executing add-on acquisitions or managing strategies such as 'buy-and-build'. This isn't the case for VC sponsors, whose portfolio firms are mainly growing organically.

In terms of channels for exiting their investments, IPOs are important for both PE and VC investors. However, within the VC world, IPOs are commonly considered the exit channel of choice for the best performing ventures (Black & Gilson, 1998; Gompers, 1995; Lerner, 1994; Masulis & Nahata, 2011; Petty et al., 1994). This dynamic cannot be observed for PE sponsors. In terms of exiting their investments following the IPO, both PE and VC sponsors hold on to their shares for a considerable time after the IPO: the majority of PE and VC sponsors do not sell any shares in the IPO and there is substantial share retention until one to three years after the IPO (Barry et al., 1990; Dong et al., 2020). The other main exit channels for financial sponsors are either trade or secondary sales – these, however, are not part of this paper's explicit focus.

2.2 Post-IPO acquisition activity of newly public firms and the role of financial sponsors

The desire to acquire is a major motivation for firms to go public (Brau & Fawcett, 2006). Yet, research on the acquisitions of newly public firms is comparatively limited with the dominating theme being the post-IPO uptake in acquisition activity (e.g., Anderson et al., 2017; Celikyurt et al., 2010; Hovakimian & Hutton, 2010). Celikyurt et al. (2010) document that newly public firms are significantly more acquisitive than their more mature public industry peers. This is not only driven by IPO proceeds, but also by better access to credit markets and the ability to use newly issued shares as a currency in acquisitions. Hovakimian and Hutton (2010) largely confirm these results and further show that IPO firms also alter the scope of acquisitions: bidders shift from acquisitions of subsidiaries towards acquisitions of entire private firms while also pursuing public

firms that are larger and have higher valuation multiples than those they would typically pursue while still private. Both Celikyurt et al. (2010) and Hovakimian and Hutton (2010) find evidence that newly public firms time the market when making the decision to acquire as they are more likely to pay with stock when their valuations are high.

Anderson et al. (2017) likewise show that the IPO is a starting point for future M&A activity. Moreover, they document that investors use observable IPO characteristics to predict future M&A activity. Firms with a high perceived likelihood of engaging in future acquisitions subsequently earn insignificant returns upon the actual merger announcement, while those with a low perceived probability of acquiring post-IPO earn significant positive returns surrounding the merger announcement. These positive returns, however, do not last as stock price reversals are observed in the long-run. In a related study, Anderson and Huang (2017) document that institutional investors make specific investments in newly public firms that are more likely to engage in and perform well in post-IPO M&As. Developing a theoretical framework, Hsieh et al. (2011) directly link IPOs to a firm's takeover strategy. In their model, going public significantly reduces the information uncertainty regarding a firm's value, allowing the firm to leverage this information to optimally exercise its post-acquisition restructuring policy to derive a higher value from the transaction.

Brau et al. (2012) examine the long-run stock market performance of firms that engage in an acquisition within the first year after their IPO. They document significant underperformance for these firms in subsequent years, while companies that refrain from acquiring show slightly positive returns. The poor performance of newly public acquirers potentially contributes to the observed underperformance of IPO firms. Yet, when looking at the short-term market reaction of

M&A announcements of newly public firms, Wiggenhorn et al. (2007) find positive returns. However, the long-term post-acquisition performance is no different to non-acquiring firms.

The literature so far is relatively silent on the role of financial sponsors in either promoting or diminishing the acquisition activity of newly public firms. Prior studies either do not address sponsor backing or merely treat it as an ancillary topic or control in their analyses. Moreover, sponsor backing is always interpreted as VC backing with PE-backed firms only marginally considered, if at all (e.g., Anderson et al., 2017; Arikan & Capron; Brau & Fawcett, 2006; Celikyurt et al., 2010; Ragozzino et al., 2018; Wiggenhorn et al., 2007). The silence on the role of financial sponsors in post-IPO acquisition activity is somewhat surprising as PE and VC firms may induce corporate myopia but could also be the driving force behind a company's growth strategy.[4] Therefore, it is important to obtain a better understanding of the influence of financial sponsor backing on the post-IPO acquisition activity and performance of newly public firms. Financial sponsors are more prevalent today than at any time before and have backed more than 50% of US IPOs over the past two decades (Ritter, 2021). Moreover, during this time period financial sponsors changed the way they operate, shifting specifically towards greater operational orientation and growth-focused strategies (Lerner et al., 2011). Understanding their roles and the potential pitfalls of sponsor backing is hence crucial for entrepreneurs and investors alike.

As previously outlined, the investment strategy of PE firms differs from those of VC firms, with the former investing in mature firms with stable cash flows and the latter focusing on smaller,

[4] The issue of myopia may be especially relevant where the dominating shareholders represent "impatient" capital with limited investment horizons, which is an inherent part of PE and VC firms' investment philosophy and particularly true in the period of post-IPO transitionary ownership where the primary objective is a (profitable) exit. This may lead to companies underinvesting relative to a value maximizing strategy (Brossard et al., 2013; Bushee, 1998; Garel, 2017; Wahal & McConnell, 2000). In contrast, PE and VC firms may specifically pursue growth opportunities as markets tend to reward growth stories. This later point seems to be rather prevalent, as previous studies were not able show that financial sponsors are a source of corporate myopia; the contrary rather appears to be the case (Hall, 1989; Lerner et al., 2011; Lichtenberg & Siegel, 1990).

innovative firms with uncertain cash flows. This difference is also observable in IPO firms. Looking at UK IPOs between 1992 and 2005, Levis (2011) finds that PE-backed IPO firms are, on average, larger and more profitable compared to non-backed IPOs. At the same time, PE-backed firms show better long-term stock market performance during their first three post-IPO years, with higher PE ownership being associated with higher long-run returns. Furthermore, there is no evidence that PE firms are better able to time the market than non-backed firms when it comes to IPOs or that they are using IPOs to offload underperforming portfolio companies (Michala, 2019). Brau et al. (2012) find evidence that VC backing at the time of a firm's IPO has a positive impact on the long-run stock performance, but only when benchmarking the returns against the market adjusted model. This confirms the results of Brav and Gompers (1997), who show that VC-backed IPO firms outperform non-VC-backed ones when using equal weighted returns as a benchmark, but not when using value weighted returns.[5]

The results of the literature on the role of VC backing on the acquisition activity of newly public firms have so far been ambiguous. Anderson et al. (2017) find some evidence that there is an increased likelihood of VC-backed newly public firms becoming post-IPO acquirers. In contrast, Hovakimian and Hutton (2010) and Celikyurt et al. (2010) do not find that VC backing plays a significant role, while Ragozzino et al. (2018) even show that VC backing significantly lowers a firm's likelihood to make acquisitions following its IPO. In related research, Masulis and Nahata (2011) document that firms acquiring VC-backed targets earn higher stock returns upon M&A announcements compared to acquisitions of non-VC-backed targets. Particularly VC-backed firms,

[5] When it comes to exiting their investments, Dong et al. (2020) document that PE firms tend to do so through follow-on secondary equity offerings or third party takeovers, with the latter occurring later than the former. While secondary offerings are associated with stock price declines, Dong et al. (2020) argue that they are a channel through which PE firms can achieve a more timely exit and are therefore willing to sell at a discount compared to third party takeovers. When it comes to VC-backed firms, Gill and Walz (2016) show that VC-backed firms are more likely to delist following takeover than non-VC-backed firms, giving the VC firm an exit opportunity. IPOs are therefore not necessarily the primary exit strategy of VC firms, but rather an intermediary step prior to VC firms' ultimate exit.

where the VC fund is closer to liquidation, receive significantly lower takeover premiums, likely driven by VC firms' willingness to forgo some of the profits they could obtain to ensure a timely exit. Although the differences in the empirical results for VC-backed newly public firms are potentially driven by varying sample and control specifications, their exact sources remain unclear as there is considerable ambiguity surrounding the definition of VC backing.[6] While an exact definition may not be particularly relevant for studies whose focus does not demand going beyond controlling for VC backing, it is important for understanding the implications of VC backing, and sponsor backing more generally, on firms' post-IPO acquisition activity.

2.3 Hypotheses development

The literature offers diverging results when it comes to the influence of financial sponsor backing on the M&A activity of newly public firms. It also mainly focuses on the effects of VC backing, rather than differentiating between PE and VC backing. When it comes to VC-backed newly public firms, VC backing could increase post-IPO acquisition activity (Anderson et al., 2017), play no significant role (Celikyurt et al., 2010; Hovakimian & Hutton, 2010) or even diminish acquisition activity (Ragozzino et al., 2018). Given the inherent difference in the business model and strategy of PE and VC firms, it stands to reason that their impact on a newly public company's acquisition activity will also differ. Prior studies have frequently shown the importance of acquisition-induced growth for firms with few organic growth opportunities, while firms with ample organic growth opportunities are less likely to pursue inorganic growth (see e.g., Greve, 2008). Given their business model and the maturity of the companies they back, PE firms are likely to rely on inorganic growth through (strategic) acquisitions. This, combined with the markets'

[6] The studies by Anderson et al. (2017), Celikyurt et al. (2010), Hovakimian and Hutton (2010) as well as Ragozzino et al. (2018) remain silent on whether they employ a threshold for VC ownership that has to be met before a company is considered VC-backed.

tendency to reward growth stories, may lead PE-backed newly public firms to engage in acquisitions at a higher frequency than VC-backed or non-backed firms. We therefore hypothesize:

H1: *PE-backed newly public firms engage in acquisitions more frequently than VC-backed or non-backed newly public firms.*

In contrast, the frequency and timing of acquisitions of VC-backed newly public firms is likely to trail that of their non-backed peers (and by extension of their PE-backed peers). This assumption is based on VC firms backing companies that are smaller and inherently more risky (see e.g., Levis, 2011). These firms are also likely to have more internal growth opportunities and therefore have no critical need to engage in acquisitions to grow. This leads to the following hypothesis:

H2a: *VC-backed newly public firms engage in acquisitions less frequently than non-backed newly public firms.*

Given our assumption that VC-backed newly public firms are less likely to engage in post-IPO M&A activity and rather realize organic growth options, they may be more likely to use their IPO proceeds on such options. Capital markets tend to reward organic growth investments, such as increases in R&D spending, provided the respective firm is believed to have viable organic growth options (Chan et al., 1990; Woolridge, 1988; Zantout & Tsetsekos, 1994). Additionally, Celikyurt et al. (2010) show that VC backing is positively associated with R&D and CAPEX spending in the years following an IPO, suggesting a higher reliance on internal growth options for VC-backed firms. We therefore hypothesize:

H2b: *VC-backed newly public firms emphasize internal growth options more than PE-backed or non-backed newly public firms.*

When it comes to acquisitions, newly public firms also appear to pivot towards acquiring larger targets (Hovakimian & Hutton, 2010). Particularly PE-backed firms may engage in different types of acquisitions than their VC-backed or non-backed peers. This may, on the one hand, be due to the different investment strategies of PE and VC sponsors, but may, on the other hand, also be driven by the PE firms' experience. The primary advantages are access to the PE firm's M&A process expertise, experiences obtained from past acquisitions and the support the PE firm could potentially provide regarding target selection, valuation, due diligence, purchase price negotiations and post-merger integration. In addition, our data suggests that PE-backed IPO firms engage in more acquisitions prior to going public (average of 0.8 acquisitions during the three years prior to the IPO) than their VC-backed (0.5 acquisitions) or non-backed peers (0.4 acquisitions) and may therefore leverage this past experience. This broader set of experience in M&A may not only manifest itself in the quantity of transactions, but also in how transformative these transactions are. PE-backed firms may be more open to complex cross-industry or cross-border transactions, where the newly public company may serve as platform for further (strategic) add-on acquisitions.[7] In contrast, VC-backed and non-backed newly public firms are likely to avoid complex deals. We therefore hypothesize:

H3: *PE-backed newly public firms are more likely to engage in transformative transactions than their VC-backed or non-backed peers.*

With respect to the value creation of acquisitions by newly public firms, several studies find at least some evidence of positive short-term wealth effects (e.g., Anderson et al., 2017; Arikan &

[7] There is anecdotal evidence that firms are actively looking for PE-investments if they wish to engage in a buy-and-build strategy. For example, the German construction company WWB Tiefbau stated in a press release: "*Our "buy-and-build" strategy requires a lot of capital and manpower/expertise. We, therefore, want to embark on this journey with a strong partner in these dimensions. (…) We are happy and proud to explore this new territory with our partner Auctus Capital Partners (…).*" (translated from German) WWB Tiefbaugesellschaft (2021).

Capron, 2010; Wiggenhorn et al., 2007), a finding that is in contrast to the traditionally negative announcement returns observed for public acquirers (e.g., Moeller et al., 2004; Mulherin & Boone, 2000). However, we expect that PE-backed newly public firms will obtain higher returns than VC-backed and non-backed newly public firms. This is based on the assumption that PE-backed firms can benefit from their financial sponsor's expertise in running an efficient M&A process and successful post-merger integration, which should result in more beneficial capital market valuations. There is also some evidence that VC backing has a negative impact on the acquisition performance of newly public firms (Wiggenhorn et al., 2007), which may be due to shareholders expecting VC-backed newly public firms to focus on organic rather than inorganic growth. When it comes to the long-run stock market performance following the IPO, PE-backed firms are shown to perform better than non-backed firms (Levis, 2011). For VC-backed firms, the picture is less clear and any long-run outperformance appears to be contingent on the methodology employed (e.g., Brau et al., 2012; Brav & Gompers, 1997). Based on these differences, we hypothesize for the short-term (**H4a**) and long-run (**H4b**) stock performance of newly public firms:

H4a: *PE-backed newly public firms that acquire following their IPO show higher short-term stock returns surrounding merger announcements than VC-backed and non-backed newly public post-IPO acquirers.*

H4b: *Newly public firms that acquire show higher long-run stock returns following their IPOs than non-acquirers, with PE-backed acquirers achieving the highest returns.*

3. Data

3.1 Sample construction

We create a sample combining IPO firms that went public on US stock exchanges between 2001 and 2017 with their associated M&A transactions within a 3-year period after the date of going

public. For IPO-related data, we use Refinitiv's Securities Data Company Platinum (SDC) as a basis. We filter for IPO firms that went public on NASDAQ, NYSE and NYSE American[8] between January 2001 and December 2017 and exclude both depositary issues and closed-end funds. This approach yields 2,207 observations. In line with standard research practice (e.g., Liu & Ritter, 2011; Loughran & Ritter, 2004), we limit the sample to IPO companies using a firm commitment regime and to offerings of common shares which reduces the sample size to 1,953. Next, we exclude simultaneous offerings (i.e., parallel offerings at multiple exchanges) for which the US is not the target market as well as IPO firms from the financial sector (e.g., banks, insurance companies, asset managers, REITS, SPACs, etc.) which leaves us with 1,615 remaining observations.[9] Lastly, we exclude 274 IPO companies that either did not survive the first three years after their IPO or that were insufficiently covered, e.g., newly public firms for which no prospectus could be found in the US Securities and Exchange Commission's (SEC) Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database. This leaves us with a final sample of 1,341 IPOs. As SDC only provides limited data on identity and size of stakes held by financial sponsors at the time of the IPO, we hand-collect the corresponding ownership data for all financial sponsor-backed IPOs using the prospectuses available in the SEC's EDGAR database. Specifically, we collect the identity and pre- and post-IPO shareholdings of all reported institutional shareholders. We then map the investment vehicle names collected from the IPO prospectus to the associated financial sponsor to establish how many distinct sponsors are invested in a certain IPO company. We use the collected ownership data to set a threshold of 25% that the financial sponsors

[8] To identify US IPOs on SDC, we use a two-tiered approach. In a first step, we exclude all companies whose "Primary Exchange Nation" is any country other than the United States. In a second step, we look at the "Issuer/Borrower Stock Exchange Name" and only retain IPOs on NASDAQ, NYSE and NYSE American.

[9] Some studies also exclude IPOs with an offer price lower than USD 5. In our sample, 30 IPOs fall below that threshold. When excluding these, our results remain unchanged.

need to hold cumulatively in order to classify an IPO as financial sponsor-backed and, for those IPOs classified as financial sponsor-backed, we use the flag provided by SDC in order to differentiate between PE- and VC-backed IPOs. Following this procedure, 917 IPO firms are categorized as sponsor-backed (386 PE-backed and 531 VC-backed) while the remaining 424 IPO firms are categorized as non-backed.

For M&A transaction-related data, we again use SDC as a starting point to collect the acquisitions associated with the IPO companies in our sample. This time, we filter for M&A transactions completed between 2001 and 2020 so that we cover the three-year post-IPO period for all firms in our sample that went public between 2001 and 2017 and their associated transactions.[10] We include all transactions above a materiality threshold of USD 10 million (in case a deal value is reported).[11] Employing these filters results in an initial M&A sample size of 8,917 transactions. We exclude M&A transactions that could not be mapped unambiguously to one IPO firm in our sample, which leaves us with 7,348 remaining observations. We then map these acquisitions to the IPO firms in our sample and compare the date of the acquisition to the date of going public. Out of the 7,348 transactions, 1,845 deals have taken place within the first three years after the associated IPO, while another 3,793 deals were conducted more than three years following the IPO and are hence not relevant for our analysis. An additional 1,710 transactions were undertaken prior to the IPO, 723 of which fall within three years before the IPO. The 1,845 deals conducted within the first three years following the IPO will serve as our main research sample, while the transactions conducted pre-IPO will be of interest as a control variable

[10] We additionally collect data on M&A transactions conducted by the IPO firms in our sample in the years 1998-2000 to construct a variable measuring the three-year pre-IPO M&A experience for all firms in our sample.

[11] We complement the SDC data by manually researching all acquisitions with unreported deal values in the database and hand-collect 293 additional deal values, 154 of which are below USD 10m and thus excluded from our sample. Otherwise, in line with prior literature (e.g., Celikyurt et al. (2010)) we also keep all transactions with no reported deal value. Results reported in Section 4 are qualitatively unchanged when restricting the sample to acquisitions with reported deal values only.

for prior M&A experience in our regression models. Further, we use Refinitiv's Datastream for retrieving daily stock price data for all sample firms. Finally, we supplement the variables provided by SDC with financial data for the acquirer (e.g., revenue, EBIT, total assets, etc.) from Refinitiv's Worldscope database (see Table A-1 in the Appendix for more details on all relevant variables).

3.2 Descriptive statistics

Our sample comprises a total of 1,341 IPO firms and 1,845 associated M&A transactions within three years after the IPO. Table 1 provides a breakdown of these IPO companies and the respective M&A transactions according to their IPO year and their backing classification (either PE-backed, VC-backed, or non-backed) using the 25% threshold. Across all years, 386 IPO firms (29%) are PE-backed, 531 (40%) are VC-backed and 424 (31%) are non-backed. For the M&A transactions within the first three years post-IPO correspondingly, 881 deals (48%) are PE-backed, 441 (24%) are VC-backed and 523 (28%) are non-backed. Interestingly, PE-backed firms conduct the most M&A within the first three years after going public with an average of 2.3 transactions, while VC-backed companies are the least active in the M&A market with an average of only 0.8 deals, making PE-backed IPO firms almost three times as acquisitive as their VC-backed counterparts. Non-backed firms range between the two sponsor groups with an average of 1.2 deals per company. The data also reveals that PE-backed IPO firms are generally the most likely to acquire during the first three years of being public, with 61% of PE-backed firms engaging in at least one acquisition, compared to 39% for VC-backed firms and 44% for non-backed firms.

[Insert Table 1 approximately here]

Table 2 provides additional details on the differences in ownership structure between PE-backed and VC-backed newly public firms and thereby highlights the differences in investment styles between PE and VC investors. While VC investors usually invest smaller stakes in multiple

rounds of funding, PE investors tend to buy entire companies by themselves and have a lower propensity to co-invest with other PE investors. Consequently, PE sponsors tend to hold significantly larger stakes in their IPO firms than VC sponsors, both cumulatively (77.9% average cumulative share for PE firms compared to 53.4% for VC firms) as well as related to the leading sponsor's share (65.7% average leading sponsor share for PE-backed firms compared to 26.4% for VC-backed ones). Correspondingly, VC-owned IPO firms are backed by more sponsors than PE-owned IPO firms with the average VC-owned IPO company being backed by 3.4 sponsors compared to 1.7 sponsors for PE-owned IPO companies. The difference between PE-backed and VC-backed firms is statistically significant at the 1% level for both average and median. Lastly, the higher level of shareholder dispersion in VC-backed IPO firms is also evident in the Herfindahl-Hirschman-Index (HHI) of stakes held pre-IPO, with PE-backed firms having an average sponsor HHI of 0.8, while VC-backed firms only have a sponsor HHI of 0.4. Differences between PE and VC backing are again significant at the 1% level.

[Insert Table 2 approximately here]

Table 3 compares the different backing groups of newly public firms in our sample with respect to firm characteristics (Panel A) and IPO characteristics (Panel B). Differences between the ownership groups are significant across most characteristics, highlighting that the average IPO firm's characteristics differ depending on whether it is backed by PE investors, VC investors or not backed. With respect to firm characteristics, newly public firms backed by PE investors tend to be the oldest and have the highest revenues, return on assets and book leverage, while they have the lowest market-to-book ratios, financial slack and organic growth. VC-backed firms, in contrast, are on the other end of the distribution. They tend to be the youngest and have the lowest revenues, return on assets and book leverage while they rank highest with respect to market-to-book ratios,

financial slack and organic growth. All differences in firm characteristics between PE-backed and VC-backed companies are again highly significant for both average and median, highlighting the importance of differentiating between PE- and VC-backed IPO firms when discussing the role of financial sponsors in newly public firms. Across all firm characteristics, non-backed firms tend to rank in between PE- and VC-backed firms. With respect to IPO characteristics, PE-backed firms are the least likely to mention M&A as an IPO motive in their prospectus, which is surprising given that PE-backed firms conduct the most post-IPO M&As in our sample. They also employ more prestigious underwriters than both VC-backed and non-backed firms. VC-backed firms raise the lowest primary proceeds across all ownership groups and are most likely to mention M&A in their IPO prospectus, despite their low post-IPO M&A frequency. Finally, VC-backed firms experience significantly higher underpricing than their PE-backed and non-backed peers.

[Insert Table 3 approximately here]

4. Empirical results

4.1 Sponsor backing and acquisition frequency

To investigate the role of financial sponsor backing on post-IPO acquisition frequency, we first conduct univariate tests on the differences in acquisition behavior between PE-backed, VC-backed and non-backed IPO firms. Table 4 shows the results of the difference tests. Panel A summarizes the acquisition frequency before and after the IPO across ownership groups. Our data reveals that PE-backed firms undertake most acquisitions, both before and after the IPO, with on average 0.80 and 2.28 acquisitions, respectively, while VC-backed firms conduct, on average, 0.47 acquisitions in the three years prior to the IPO and 0.83 acquisitions in the three years following the IPO. The differences between PE-backed firms vis-à-vis VC-backed and non-backed firms are statistically significant at the 1% level for both the pre- and the post-IPO period, providing support for

hypothesis **H1**. While VC-backed and non-backed firms *pre-IPO* acquisition activity appears similar, we find some evidence that VC-backed firms conduct fewer acquisitions than their non-backed peers *post-IPO*. We also compare the degree to which the IPO accelerates acquisition frequency across ownership groups. Consistent with Celikyurt et al. (2010), we find that the acquisition frequency increases materially after going public. However, the acceleration deviates among ownership groups: it is most pronounced for PE-backed firms, who, on average, conduct approximately 1.48 more acquisitions in the three years following their IPO than in the three years prior to the IPO, while these differences stand at 0.36 and 0.85 for VC- and non-backed newly public firms, respectively. The differences in M&A acceleration are significant between all groups. It is worth highlighting that the acceleration in acquisition behavior is markedly lower in case of VC-backed IPO firms than for their PE- or non-backed peers, potentially indicating that acquisitions are, after all, not the primary motivation for VC-backed firms to go public. Table 4 Panel B additionally provides tests on selected deal characteristics. It becomes evident that the three ownership groups not only differ in their acquisition frequency but also in the nature of the acquisitions they engage in. PE-backed firms are significantly less likely to pay with stock than their VC-backed and non-backed peers while VC-backed firms conduct significantly smaller acquisitions than PE-backed and non-backed firms. Both PE-backed and VC-backed newly public firms appear to have a propensity to acquire higher stakes in their target than their non-backed peers, albeit the difference is economically small. Finally, we find no significant difference in the propensity to conduct cross-border or cross-industry acquisitions between PE-backed, VC-backed, and non-backed IPO firms.

[Insert Table 4 approximately here]

To test whether these findings also hold in a multivariate regression setting, we conduct several regressions on the number of acquisitions conducted post-IPO. The regression takes the form:

$$Acquisition\ Frequency_i = \alpha + \beta_1 PEBacked_i + \beta_2 VCBacked_i + \sum_j \gamma_j X_{i,j} + \sum_k \delta_k Y_{i,k} + \sum_l \tau_l Z_{i,l} + \varepsilon_i \quad (1)$$

where *Acquisition Frequency* is the dependent variable and defined as IPO firm *i*'s total number of post-IPO acquisitions during the first (model 1), the first two (model 2), and the first three (model 3) years following the IPO.[12] The independent variables are divided into sponsor backing, company characteristics, IPO characteristics and M&A characteristics. The sponsor backing binary variables are our variables of interest and consist of *PEBacked* and *VCBacked*, both binary variables defined as one if the IPO firm is at the time of the IPO either 25% or more PE or VC owned, respectively, and zero otherwise.[13] $X_{i,j}$ $Y_{i,k}$ and $Z_{i,l}$ are vectors of variables related to company, IPO, and M&A characteristics, and ε_i is the error term. The vector of company characteristics includes variables such as a firm's revenue, return on assets or book leverage, the vector of IPO characteristics contains variables, amongst others, relating to the primary proceeds raised in the IPO and the underwriter's reputation, while the vector of M&A characteristics consists of variables relating to a firm's pre-IPO acquisition activity and a firm's industry M&A intensity. Table A-1 in the Appendix provides detailed variable definitions.

[12] Due to the nature of our dependent variable (being a count of events), we also conduct a Poisson regression as a robustness check. The results are presented in Table OA-1 in the Online Appendix and confirm the ones presented in this section.

[13] We also vary the ownership threshold we employ for financial sponsors and while we find that the statistical strength of the relations slightly decreases when lowering the threshold, they remain significant.

The regression results in Table 5 show that PE-backed IPO firms conduct significantly more acquisitions post-IPO than their non-backed peers for all time horizons, providing further support for hypothesis **H1**.[14] The further we extend the time horizon, the more significant and economically large the effect of PE backing becomes. In results reported in Table OA-2 in the Online Appendix, we also find that PE backing significantly reduces the time a newly public firm takes to conduct its first acquisition post-IPO. With respect to the role of VC backing, the corresponding dummy is negative but statistically insignificant, indicating that the significant difference found in Table 4 may at least partially be explained through other variables. In order to investigate a potential non-linear relationship between sponsor backing and the number of post-IPO acquisitions, we also re-estimate our analysis using ordered logit regressions. The results are reported in Table OA-3 in the Online Appendix and remain robust.

The influence of VC backing on post-IPO acquisitions has been addressed in the literature, albeit only as a control variable in analyses primarily focusing on other research questions. Our findings on VC backing are consistent with Hovakimian and Hutton (2010), but stand in contrast to Anderson et al. (2017) who find weak evidence for VC backing to be associated with a higher likelihood of becoming an acquirer during the first three years after going public, albeit they also find VC backing to be insignificant for the one and two year time horizons. The difference may be a consequence of different types of analyses.[15] Celikyurt et al. (2010) also include a VC dummy in their analysis on post-IPO acquisition volume and find some evidence for a positive relationship between VC backing and stock-financed acquisitions as well as a negative relationship between

[14] In unreported results, we rerun the same analysis excluding the years of the 2007/2008 financial crisis. The findings remain robust.

[15] While Anderson et al. (2017) use a logit regression approach to predict the likelihood of becoming an acquirer, we use an OLS regression explaining acquisition frequency. It may be the case that VC backing increases the likelihood of becoming an acquirer but at the same time has no statistically significant effect on acquisition frequency, especially if VC-backed IPO firms are more likely to conduct only a few acquisitions after going public.

VC backing and cash-financed acquisitions. In unreported results, we find that the coefficient associated with the VC dummy is positive and statistically significant when restricting the sample to stock-financed acquisitions, in line with Celikyurt et al. (2010). We do not, however, find a statistically significant negative coefficient associated with the VC dummy when restricting the sample to cash-financed acquisitions only. In line with our results indicating no significant relationship between VC backing and post-IPO acquisition frequency, we reject hypothesis **H2a**.

Interestingly, only PE backing exceeds common thresholds employed for statistical significance while VC backing remains insignificant. The differential pattern between these two sponsor groups may be a consequence of the inherent differences in their business models and investment styles. PE investors tend to rely more heavily on acquisition-based strategies to foster growth in their portfolio firms than VC investors do. To support this strategy, PE funds possess substantial M&A expertise and are well connected to relevant M&A players, such as investment banks, while VC funds typically focus more on other sources of value creation. Thus, the positively significant effect observed for PE-backed firms may be a consequence of the active involvement of PE funds in their portfolio firms, supporting the portfolio firm's acquisitions with their knowledge, resources, and network even after it went public. It may also be possible that, given their desire for acquisition-based growth strategies, PE funds are better at selecting suitable target firms.

To gain additional insights into sponsors' role in driving post-IPO acquisition behavior, we rerun the same regression only for the subsample of IPO firms in which the largest financial sponsor holds a share of at least 50%. If there is indeed a causal relationship between financial sponsor backing and post-IPO acquisition behavior, we would expect that this relationship becomes more accentuated in the case of majority sponsors as these sponsors have a controlling

stake in the firm as well as more power to enforce their interests. The results are shown in regression models (4) through (6) in Table 5. The results are similar to models (1) to (3) in that PE backing positively affects post-IPO acquisition frequency, providing further support for **H1**, while VC backing remains statistically insignificant. It is also worth noting that, comparing the first three to the last three models, the statistical significance of the PE dummy increases. The PE dummy is significant at the 1% level in models (4) to (6) while significance varies between the 10% and 5% level in models (1) to (3), strengthening the evidence for a causal link between PE backing and post-IPO acquisition behavior as one would expect majority owners to impress their views on (acquisition) strategy more directly than non-majority owners.

[Insert Table 5 approximately here]

The control variables provide some additional insights into the drivers of post-IPO acquisitions. Newly public firms benefit from the proceeds they raise through the IPO to conduct acquisitions, with higher proceeds associated with increased acquisition activity. Revenues likewise affect post-IPO acquisitions positively. Unsurprisingly, firms acquire significantly more when they disclose M&A as one of their motives for going public in their IPO prospectus. Prior M&A experience also plays an important role as newly public firms that have acquired prior to going public also engage in more acquisitions following the IPO. Growth options outside of M&A negatively affect acquisitions post-IPO as indicated by the negative and significant coefficient for the organic growth variable. The coefficients of the other control variables remain largely insignificant.

4.2 Organic growth alternatives and acquisition characteristics

In order to test our hypothesis **H2b** that VC-backed IPO firms favor organic growth, we investigate whether VC-backed firms rely more heavily on organic growth options to substitute for their lower

acquisition volume vis-à-vis PE-backed and non-backed IPO firms. We use the sum of Capex and R&D expenses as a proxy for organic growth investments and conduct several regressions on this sum using the same set of variables as in equation 1. The results are presented in Table 6. We find evidence supporting hypothesis **H2b** in specifications (2) and (3) where VC backing is associated with significantly higher Capex and R&D expenses. This finding is consistent with Celikyurt et al. (2010), who likewise document a significantly positive relationship between VC backing and R&D and Capex investments for all time horizons between zero and four years after the IPO. The coefficient for *VCBacked* remains insignificant in specification (1) for the first-year post-IPO period, which may be a consequence of IPO firms focusing on rebalancing their accounts instead of financing future growth in the year immediately after the IPO (Pagano et al., 1998). As expected, we find no comparable effect of higher organic growth investments in PE-backed IPO firms. It is worth noting, however, that the coefficient for *PEBacked* is also not significantly negative, indicating that PE-backed newly public firms do not seem to conduct significantly fewer organic growth investments compared to non-backed newly public firms despite their focus on acquisition-based growth strategies. Therefore, it appears that the previous results are not a consequence of PE sponsors using M&A as a substitute for Capex and R&D expenditures. Our control variables again provide further insights into the drivers of organic growth investments. Unsurprisingly, firm revenue, return on assets, financial slack, organic growth/assets and IPO proceeds are all associated with higher levels of organic growth investments. Underwriter reputation and underpricing also have a positive relationship with respect to organic growth which is consistent with other studies finding a positive link between the two variables and firm quality (Zheng & Stangeland, 2007). High first 30-day returns are also associated with higher levels of organic growth. Moreover, having conducted M&As pre-IPO positively affects post-IPO organic growth

investments. Finally, there appears to be a significantly negative relationship between offer price revision and post-IPO organic growth investments. As offer price revision is often perceived as a proxy for valuation uncertainty in the literature (see e.g., Loughran & McDonald, 2013), this negative effect may be a consequence of organic growth strategies being inherently more difficult to evaluate. The coefficients of the remaining control variables lack significance.

[Insert Table 6 approximately here]

With respect to acquisition characteristics, hypothesis **H3** proposes that PE-backed IPO firms are more likely to conduct transformative acquisitions given their M&A experience and capabilities. We identify three proxies for the degree to which an acquisition may be transformative for the acquirer. First, cross-border acquisitions, which are typically more complex to manage for acquirers as they usually involve a different culture, language and/or governance system. Second, cross-industry acquisitions, which are by nature more difficult to value and integrate for acquirers given that they need to evaluate an industry outside of their core area of expertise. Third, acquisitions that involve a large target relative to the size of the acquirer, as these target firms are typically more complex and therefore likely more difficult to integrate.

We investigate the likelihood of conducting transformative acquisitions following these three proxies using the subsample of the 629 IPO firms that conduct at least one acquisition in the first three years of going public and employ logit regressions with three different specifications for the dependent variable. In model 1, the dependent variable is equal to one if at least one of the deals the firm conducts is a cross-border deal following its IPO, zero otherwise, in model 2 the dependent variable is equal to one if the IPO firms engaged in at least one post-IPO cross-industry acquisition, defined as a transaction where acquirer and target come from different Fama-French 49 industry portfolios, zero otherwise and in model 3 the dependent variable is equal to one if at

least one acquisition following the IPO is large in relative size, whereby this is defined as a ratio of deal value to acquirer revenue at the time of the IPO being greater than 50%, zero otherwise.

The results of this analysis are shown in Table 7. The PE dummy is positive but statistically insignificant in specifications (1) and (2), indicating that PE-backed IPO firms are not significantly more likely to conduct cross-border or cross-industry acquisitions than their peers. Similarly, we find no significant relationship between VC backing and cross-border or cross-industry acquisitions, albeit here the coefficients are negative. With respect to specification (3), we find that PE-backed IPO firms are significantly more likely to acquire relatively large targets. This may be caused by the M&A experience and capabilities a PE investor can provide, which could allow PE-backed newly public firms to pursue larger targets that other potential acquirers refrain from. We therefore find some evidence in favor of hypothesis **H3**. However, as this support is only related to one of the three proxies that we identified for the transformative degree of an acquisition, we conclude that overall hypothesis **H3** can only be partially supported. Our control variables further reveal that firm revenue and disclosure of M&A as an IPO motive positively predict cross-industry deals while higher proceeds raised through an IPOs appear to enable newly public firms to conduct larger acquisitions relative to their own size.

[Insert Table 7 approximately here]

4.3 Short-term stock returns

We now turn to an examination of the short-term stock returns of newly public firms. The short-term abnormal returns (ARs) are calculated using the market-adjusted model and summing the ARs over the respective event window to obtain cumulative ARs (CARs):

$$CAR_{i,[\tau_1,\tau_2]} = \sum_{t=\tau_1}^{\tau_2} (R_{it} - R_{mt}) \quad (2)$$

where $CAR_{i,[\tau_1,\tau_2]}$ is firm *i*'s CAR during the event window $[\tau_1;\tau_2]$ with $\tau_1, \tau_2 \in [-2, \dots, +2]$, R_{it} is firm *i*'s stock return and R_{mt} is the market return, for which we use the Russell 3000 Index. Average CARs are calculated by adding all company CARs over a specific event window and dividing by the total number of firms.[16] After controlling for confounding events (e.g., multiple acquisitions at the same time, earnings announcements, etc.), we are left with a sample of 1,662 observations out of our sample of 1,845 observations.

Table 8 presents the results of the short-term event study. Our first observation is that acquisition announcements of newly public acquirers are met by positive short-term valuation effects, a pattern that holds across all event windows as well as backing groups and is significant in the majority of cases. This observation may come as a surprise since it stands in contrast to the negative announcement returns typically observed for acquisitions by public acquirers more generally (e.g., Moeller et al., 2004; Mulherin & Boone, 2000). However, our results are in line with the related literature: Arikan and Capron (2010) as well as Wiggenhorn et al. (2007) also observe positive announcement returns for newly public acquirers.

[Insert Table 8 approximately here]

There are different hypotheses as to why the acquisition announcements of newly public firms are met by positive valuation effects. Some suspect that recently public firms may be better

[16] We prefer calculating abnormal returns using the market-adjusted model, as some companies engage in acquisitions rather shortly after their IPO, resulting in estimation periods that would be too short to use the market model event study approach. However, as a robustness test we also use a market model event study of the form $AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$ with an estimation window from t = −126 to t = −3, with R_{it} and R_{mt} again being firm *i*'s stock return and the market return as approximated by the Russell 3000 Index and α_i and β_i are the slope coefficient and the sensitivity of stock *i* to the market index. The results presented in Table OA-4 in the Online Appendix are very similar to the ones using the market-adjusted model.

positioned to capitalize on growth opportunities and thus can justify acquisitions as a means of growth and increasing market share more credibly than their mature peers (Wiggenhorn et al., 2007). Another hypothesis postulates that the substantial outside monitoring of newly public firms, frequently through financial sponsors, may suppress value destroying behavior more effectively than in mature firms with less outside monitoring (Baker & Gompers, 2003; Wiggenhorn et al., 2007). If the latter hypothesis were true, we would expect CARs to be significantly more positive for PE- and VC-backed newly public firms than for their non-backed peers, as expressed by hypothesis **H4a**. However, when comparing returns across backing groups, this cannot be confirmed. On the contrary, acquisition announcements made by non-backed firms are met with higher announcement returns than those by either PE- or VC-backed firms. This difference is highly significant vis-à-vis announcements made by PE-backed IPO firms and weakly significant compared to announcements made by VC-backed companies. Outside monitoring of newly public firms is therefore not a driver behind the positive valuation effects and we need to reject hypothesis **H4a**. There is also no evidence for differences between announcement returns of PE-backed and VC-backed newly public firms. Our results of higher acquisition announcement returns to non-backed firms is nonetheless in line with findings from Wiggenhorn et al. (2007). It may be that markets react favorable to "surprise" acquisition announcements, as documented by Anderson et al. (2017). Investors may anticipate PE- and VC-backed firms to engage in further acquisitions and therefore these acquisitions may already be reflected in the stock price. Non-backed newly public firms, on the other hand, may be considered less likely to engage in future acquisitions and hence their acquisition announcements may be perceived positively by capital market participants, a finding also in line with Tunyi (2021).[17]

[17] We also examine short-term stock returns in a regression setting. We use the same regression set-up as in equation 1 but substitute the dependent variable with firm *i*'s CAR during the [−2;+2] (model 1) and [−1;+1] (model 2) event

4.4 Long-term stock returns

After examining short-term stock returns surrounding M&A announcements, we now focus on long-run returns of newly public firms following their IPOs. The long-run stock returns are calculated using traditional buy-and-hold abnormal returns in line with standard practice (e.g., Brau et al., 2012; Lyon et al., 1999):

$$BHAR_i = \prod_{t=\tau_1}^{\tau_2}(1 + R_{it}) - \prod_{t=\tau_1}^{\tau_2}(1 + R_{mt}) \quad (3)$$

where $BHAR_i$ is the buy-and-hold abnormal return for firm i, $\tau_1, \tau_2 \in [0, \dots, 36]$ are the holding periods in months, excluding the first trading day for all holding periods, and R_{mt} is an equally weighted matched portfolio of up to five style-matched competitor firms. For the matched portfolio we utilize the text-based industry matching approach by Hoberg and Phillips (2010) and use those competitor firms with the highest similarity scores.[18,19] Barber and Lyon (1997) as well as Kothari and Warner (1997) document the superiority of using matched-firm approaches vis-à-vis using a reference portfolio approach (e.g., based on a market index).

Table 9 presents the results of our examination of BHARs for holding periods of 12, 24 and 36 months. In line with the vast majority of literature that observes long-run underperformance of newly public firms (e.g., Brav et al., 2000; Ritter, 1991; Ritter & Welch, 2002), we find the same result. Yet, we encounter certain nuances in relation to backing groups and post-IPO

window. The results of the regression are presented in Table OA-6 in the Online Appendix and are broadly in line with our observations from the univariate analysis of bidder CARs presented in Table 8. While the coefficients for *PEBacked* and *VCBacked* are negative, only the coefficient for *VCBacked* is significant, underscoring our previous result regarding VC-backed newly public acquirers. However, even though the coefficient for *PEBacked* is insignificant, this does not change our conclusion regarding the rejection of hypothesis **H4a**.

[18] Our initial sample of 1,341 IPO firms is reduced to 1,001 observations due to IPO firms with no match in the Hoberg and Phillips (2010) database or insufficient data on the proposed match(es). The 1,001 IPO firms in this analysis have on average 3.4 matched firms.

[19] As a robustness test, we show BHARs benchmarked against the Russell 3000 index in Table OA-5 in the Online Appendix. The results reported in this section also hold using this alternative benchmark.

acquisition activity. First, irrespective of the backing group, median BHARs are negative for holding periods of 24 and 36 months, but this does not hold for average BHARs, suggesting that there is a small number of newly public firms with strongly positive BHARs. Looking at the differences among backing groups, it appears that long-run underperformance is more present in VC- and non-backed IPO firms than in PE-backed ones. While PE-backed firms also exhibit negative median BHARs for holding periods of 24 and 36 months, these are not significantly different from zero. PE-backed newly public firms are also the only ones to exhibit significantly positive average and median BHARs over a holding period of 12 months. This difference is particularly stark between PE- and VC-backed newly public firms. It also appears as if VC-backed IPO firms perform slightly worse than their non-backed peers, which is in contrast to Brav and Gompers (1997) who find that VC-backed newly public firms outperform non-backed IPO firms in the years following an IPO. This is likely due to our sample covering a different, more recent time period.

[Insert Table 9 approximately here]

Considering results from Table 9 Panel B and C, we find that post-IPO underperformance is more present in newly public firms that do not conduct post-IPO acquisitions. For all backing groups, BHARs are more positive in the subsample of post-IPO acquirers than in the subsample of post-IPO non-acquirers, lending support to the first conjecture of hypothesis **H4b**. In line with the pattern outlined earlier, PE-backed newly public firms that acquire continue to outperform both in absolute terms with significantly positive returns for the 12- and 24-months holding periods and in relative terms vis-à-vis VC-backed newly public acquirers. We find evidence of long-term outperformance of PE-backed acquirers vis-à-vis VC-backed and non-backed ones, partially supporting the second assumption of hypothesis **H4b**, which states that PE-backed newly public

acquirers outperform VC- and non-backed post-IPO acquirers in the years after their IPO. However, there is statistical significance only for the outperformance versus VC-backed acquirers, but not for the difference to non-backed acquirers.

Combining the results of the short-term (Section 4.3) and long-run stock return analysis, we find that acquisition announcements by newly public firms are generally met by favorable market reactions. If the optimism of markets about newly public firms' acquisitions was warranted, we would expect to see newly public acquirers outperform newly public non-acquirers over the long-run, too – a result we see in Table 9 Panel D, suggesting that markets' optimism about the acquisitions of newly public firms is justified. We noted earlier that short-term valuation effects to acquisition announcements are most positive for newly public firms that are not backed by sponsors. This pattern is also reflected when looking at the differences in BHARs between acquiring and non-acquiring sub-samples across our three backing groups. While BHARs are generally more positive in the acquiring sub-group, the performance edge of the acquiring sub-group vis-à-vis non acquirers is strongest within the group of non-backed newly public firms, both in terms of economic and statistical significance. This does not mean that non-backed newly public acquirers outperform PE-backed newly public acquirers in the long-run, but rather that acquirers within the group of non-backed newly public firms most clearly outperform their non-acquiring peers from the same backing group. PE-backed newly public acquirers also outperform their non-acquiring peers, albeit the statistical significance of this difference is limited to the stock performance for the first 24 post-IPO months. Given that differences between newly public

acquirers and non-acquirers show only limited significance, the support for hypothesis **H4b** is weak at best.[20]

5. Conclusion

We investigate the differential impact of initial PE or VC backing at the time of companies' IPO on these firms' subsequent acquisition activity. Using a sample of 1,341 IPOs conducted in the US between 2001 and 2017 and 1,845 subsequent acquisitions by these newly public firms, our results indicate that PE-backed newly public firms are almost three times as likely as VC-backed firms and almost twice as likely as non-backed firms to engage in post-IPO acquisitions. Moreover, newly public PE-backed firms engage in acquisition earlier than their VC-backed or non-backed peers. In contrast, VC-backed firms display no significant differences in their post-IPO acquisition frequency or timing compared to non-backed firms.

Our results further suggest that VC-backed and PE-backed firms follow different growth strategies for their portfolio companies. While PE-backed newly public firms engage in more acquisitions and in more transformative ones, as proxied by relative target size, we find that VC-backed newly public firms have significantly higher post-IPO capex and R&D spending. This indicates that VC-backed newly public firms leverage internal and/or organic growth options rather than external ones, as appears to be the case for PE-backed firms. The stock market performance likewise differs by backing group. We document positive announcement effects to acquisition announcements, irrespective of whether the newly public firm is sponsor-backed or not, with non-backed firms obtaining the highest announcement returns. For the long-run post-IPO performance the results differ significantly by sponsor group: PE-backed newly acquiring firms

[20] As for short-term returns, we also examine long-term stock returns in a regression setting. Our dependent variable is the newly public firm *i*'s 36 months BHAR. The results of the regression are presented in Table OA-6 in the Online Appendix under model (3). The regression results broadly resonate with our findings on BHARs as reported in Table 9.

obtain significant and positive long-run abnormal returns, at least through their first two post-IPO years, while we observe a long-run underperformance in case of VC-backed and non-backed firms.

Our study extends the research on the acquisition behavior of newly public firms by documenting the impact of financial sponsor backing on firms' post-IPO acquisition activity. Specifically, we differentiate between PE and VC sponsors, a distinction that prior studies neglected. Besides backing different kinds of companies, our results suggest that PE and VC investors also promote different growth strategies in their portfolio companies, highlighting the importance of differentiating between these two types of financial sponsors. We also extend the findings on generally positive post-IPO bidder announcement returns (Wiggenhorn et al., 2007) and show that PE-backed newly public acquirers achieve significantly lower announcement returns than their non-backed peers. Finally, we add to the extant literature on IPO firm long-run underperformance (e.g., Ritter, 1991) by showing that post-IPO acquirers outperform post-IPO non-acquiring firms with the differential effect of acquisition activity being most pronounced for PE-backed newly public firms.

Our findings have implications for investors who wish to gauge IPO firms' growth strategies and their implications on short- and long-run stock market performance based on their pre-IPO ownership background. We also extend the understanding of the role that financial sponsors play as owners of newly public firms. Investors may use this information to make more informed investment decisions.

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Table 1: Sample IPOs and associated M&A transactions by year and sponsor backing

This table provides an overview of the 1,341 sample IPOs that listed on a US stock exchanges between 1 January 2001 and 31 December 2017 by year. The IPOs are classified as either private equity (PE)-backed, venture capital (VC)-backed, or not backed. In order for an IPO firm to be considered either PE-backed or VC-backed, the pre-IPO cumulative ownership held by the respective sponsor group must exceed 25% of total share capital. The number of acquisitions an IPO firm of a given year undertook during its first three post-IPO years (#acquis. in 3 yrs. post IPO) is also shown along with the average number of acquistions per IPO firm (av. #acquis. per IPO firm) and the % of IPO firms of a given year cohort that undertook at least one M&A deal (% IPO firms with >0 acquis).

	PE-backed IPO firms				VC-backed IPO firms				Non-backed IPO firms				All			
IPO year	#IPOs	#acquis. in 3 yrs. post IPO	av. #acquis. per IPO firm	% IPO firms with >0 acquis.	#IPOs	#acquis. in 3 yrs. post IPO	av. #acquis. per IPO firm	% IPO firms with >0 acquis.	#IPOs	#acquis. in 3 yrs. post IPO	av. #acquis. per IPO firm	% IPO firms with >0 acquis.	#IPOs	#acquis. in 3 yrs. post IPO	av. #acquis. per IPO firm	% IPO firms with >0 acquis.
2001	13	30	2.3	62%	14	21	1.5	50%	27	63	2.3	52%	54	114	2.1	54%
2002	12	18	1.5	58%	11	10	0.9	36%	21	16	0.8	33%	44	44	1.0	41%
2003	11	20	1.8	64%	14	20	1.4	50%	14	49	3.5	64%	39	89	2.3	59%
2004	30	84	2.8	77%	49	32	0.7	43%	37	55	1.5	59%	116	171	1.5	57%
2005	42	119	2.8	76%	21	16	0.8	43%	45	56	1.2	47%	108	191	1.8	57%
2006	37	63	1.7	49%	32	19	0.6	38%	35	40	1.1	49%	104	122	1.2	45%
2007	28	33	1.2	57%	47	29	0.6	36%	35	67	1.9	37%	110	129	1.2	42%
2008	3	1	0.3	33%	2	4	2.0	50%	11	10	0.9	45%	16	15	0.9	44%
2009	13	12	0.9	15%	8	8	1.0	38%	11	6	0.5	36%	32	26	0.8	28%
2010	20	42	2.1	60%	34	41	1.2	41%	20	10	0.5	25%	74	93	1.3	42%
2011	17	36	2.1	59%	32	39	1.2	53%	14	14	1.0	36%	63	89	1.4	51%
2012	27	78	2.9	67%	29	34	1.2	59%	13	11	0.8	54%	69	123	1.8	61%
2013	37	72	1.9	68%	52	53	1.0	40%	25	43	1.7	60%	114	168	1.5	54%
2014	46	112	2.4	59%	76	27	0.4	24%	27	25	0.9	44%	149	164	1.1	38%
2015	22	56	2.5	64%	50	33	0.7	34%	22	8	0.4	32%	94	97	1.0	40%
2016	11	58	5.3	64%	29	37	1.3	31%	28	13	0.5	25%	68	108	1.6	34%
2017	17	47	2.8	59%	31	18	0.6	35%	39	37	0.9	38%	87	102	1.2	41%
Total	**386**	**881**	**2.3**	**61%**	**531**	**441**	**0.8**	**39%**	**424**	**523**	**1.2**	**44%**	**1,341**	**1,845**	**1.4**	**47%**

Table 2: Ownership characteristics by sponsor backing

This table show the descriptive statistics relating to pre-IPO sponsor ownership, divided by private equity (PE)-backed and venture capital (VC)-backed IPO firm. The average and median cumulative share held by all sponsors and the average and median cumulative share held by the leading sponsor are shown, along with the average and median number of different sponsors. Sponsor HHI represents the Herfindahl–Hirschman Index of stakes held by all sponsors. Differences between PE-backed and VC-backed firms are tested for significance using the parametric two-sample *t*-test and the nonparametric Wilcoxon rank-sum test. *, **, and *** indicate significance at the 10%, 5%, and 1% level of significance, respectively.

	PE-backed IPO firms	VC-backed IPO firms	PE-backed – VC-backed
Average cumulative share held by sponsors (in	77.9	53.4	24.5***
Median cumulative share held by sponsors (in %)	83.7	52.2	31.5***
Average share held by leading sponsor (in %)	65.7	26.4	39.2***
Median share held by leading sponsor (in %)	67.9	22.7	45.2***
Average number of different sponsors	1.7	3.4	-1.7***
Median number of different sponsors	1.0	3.0	-2.0***
Average sponsor HHI	0.8	0.4	0.4***
Median sponsor HHI	1.0	0.4	0.6***

Table 3: Sample IPO firm characteristics

This table shows the sample IPO firms' characteristics at the time of the IPO, divided by backing group and firm characteristics (Panel A) and IPO characteristics (Panel B). The variables are defined in Table A-1 in the Appendix. The sample average is presented with the median below in parentheses. Differences between backing groups are tested for significance using the parametric two-sample *t*-test (averages) and the nonparametric Wilcoxon rank-sum test (medians). *, **, and *** indicate significance at the 10%, 5%, and 1% level of significance, respectively.

	PE-backed IPO firms	VC-backed IPO firms	Non-backed IPO firms	PE-backed – Non-backed	VC-backed – Non-backed	PE-backed – VC-backed
Panel A. Firm Characteristics						
Firm age at IPO	35.21	9.47	20.97	14.24***	-11.50***	25.74***
	(25.50)	(8.00)	(12.00)	(13.50)***	(-4.00)***	(17.50)***
Firm revenue	1,475.21	108.64	1,132.36	342.85	-1,023.72***	1,366.57***
	(537.06)	(45.56)	(91.78)	(445.28)***	(-46.22)***	(491.50)***
Return on Assets	0.00	-0.20	-0.12	0.12***	-0.08***	0.20***
	(0.02)	(-0.18)	(0.02)	(0.00)	(-0.20)***	(-0.16)***
Book leverage	0.39	0.07	0.20	0.19***	-0.13***	0.32***
	(0.39)	(0.01)	(0.11)	(0.28)***	(-0.10)***	(0.38)***
Market-to-book ratio	2.34	3.90	3.19	-0.85**	0.71**	-1.56***
	(1.78)	(3.20)	(2.07)	(-0.29)***	(1.13)***	(-1.42)***
Financial slack	0.12	0.70	0.34	-0.22***	0.36***	-0.58***
	(0.06)	(0.74)	(0.23)	(-0.17)***	(0.51)***	(-0.68)***
Organic growth/assets	0.12	0.22	0.18	-0.06***	0.04***	-0.10***
	(0.08)	(0.19)	(0.11)	(-0.03)***	(0.08)***	(-0.11)***
Panel B. IPO characteristics						
Primary proceeds	231.77	90.88	329.15	-97.38	-238.27**	140.89***
	(142.80)	(71.41)	(65.17)	(77.63)***	(6.24)	(71.39)***
M&A is IPO motive (%)	0.20	0.47	0.34	-0.14***	0.13***	-0.27***
	-	-	-	-	-	-
Underwriter reputation	11.59	8.61	6.53	5.06***	2.08***	2.98***
	(12.02)	(9.72)	(4.20)	(7.82)***	(5.52)***	(2.30)***
Offer price revision	-5.52	-6.58	-4.51	-1.01	-2.07	1.06
	(-4.55)	(0.00)	(0.00)	(-4.55)	(0.00)	(-4.55)
Underpricing	12.11	18.60	11.47	0.64	7.13***	-6.49***
	(5.87)	(11.23)	(4.36)	(1.51)	(6.87)***	(-5.36)***
First 30-days post-IPO return	2.72	3.24	5.50	-2.78	-2.26	-0.52
	(2.94)	(0.60)	(-0.06)	(3.00)***	(0.66)	(-2.34)**
Dual class share structure (%)	0.11	0.05	0.20	-0.09***	-0.15***	0.06***
	-	-	-	-	-	-
Industry acquisition intensity	1.03	1.07	1.04	-0.01	0.03***	-0.04***
	(1.00)	(1.06)	(1.00)	(0.00)**	(0.06)***	(-0.06)***

Table 4: Acquisition frequency and characteristics by sponsor backing

This table shows the sample IPO firms' acquisition frequency (Panel A) and acquisition characteristics (Panel B) divided by backing group. *# post-IPO acquisitions (3 years)* and *# pre-IPO acquisitions (3 years)* are the number of acquisitions conducted before and after the IPO, respectively, *Deal value ($mm)* is the deal value of acquisitions in million US dollars, *% of shares acquired* is the stake acquired through the transaction (i.e., irrespective of stakes held prior to the acquisition), *% paid in stock* is the share of the deal value that was paid in stock. *Deal value over acquirer sales* is the deal value in million US dollar divided by the acquirer's sales in million US dollar at the time of the IPO, *% cross-border* is the share of acquisitions that involve an acquirer and a target from different countries and *% cross-industry* is the share of acquisitions where acquirer and target come from different Fama-French 49 industry portfolios. The sample average is presented with the median below in parentheses. Differences between backing groups are tested for significance using the parametric two-sample *t*-test (averages) and the nonparametric Wilcoxon rank-sum test (medians). *, **, and *** indicate significance at the 10%, 5%, and 1% level of significance, respectively.

	PE-backed IPO firms	VC-backed IPO firms	Non-backed IPO firms	PE-backed – Non-backed	VC-backed – Non-backed	PE-backed – VC-backed
Panel A: Acquisition frequency						
# post-IPO acquisitions (3 years)	2.28	0.83	1.23	1.05***	-0.40***	1.45***
	(1.00)	(0.00)	(0.00)	(1.00)***	(0.00)	(1.00)***
# pre-IPO acquisitions (3 years)	0.80	0.47	0.38	0.42***	0.09	0.33***
	(0.00)	(0.00)	(0.00)	(0.00)***	(0.00)	(0.00)***
# post-IPO / # pre-IPO acquisitions	1.48	0.36	0.85	0.63***	-0.49***	1.12***
	(1.00)	(0.00)	(0.00)	(1.00)***	(0.00)**	(1.00)**
Panel B: Acquisition characteristics						
Deal value ($mm)	436.07	105.58	257.16	178.91	-151.58**	330.49*
	(77.78)	(36.42)	(49.04)	(28.74)**	(-12.62)**	(41.36)***
% of shares acquired	99.36	99.33	97.94	1.42**	1.39**	0.03
	(100.00)	(100.00)	(100.00)	(0.00)	(0.00)	(0.00)
% paid in stock	8.5	30.9	20.8	-12.30***	10.10**	-22.40***
	(0.0)	(10.7)	(0.0)	(0.00)***	(10.70)**	(-10.70)***
Deal value over acquirer sales	0.55	7.95	9.69	-9.14	-1.74	-7.40*
	(0.14)	(0.37)	(0.22)	(-0.08)	(0.15)**	(-0.23)***
% cross-border	26.1	23.1	26.6	-0.50	-3.50	3.00
	(0.0)	(0.0)	(0.0)	(0.00)	(0.00)	(0.00)
% cross-industry	40.2	41.3	45.1	-4.90	-3.80	-1.10
	(33.3)	(33.3)	(33.3)	(0.00)	(0.00)	(0.00)

Table 5: Regressions on post-IPO acquisition frequency

This table reports the cross-sectional regression coefficients using the IPO firm *i*'s number of post-IPO acquisitions as dependent variable. The variables of interest are *PEBacked* and *VCBacked*, both defined as one if the IPO firm is either PE-backed or VC-backed, respectively, at the time of the IPO, whereby the sponsor's backing must exceed an ownership threshold of 25% in the IPO firm, and zero otherwise. The other variables are divided in company characteristics, IPO characteristics and M&A characteristics and are defined in Table A-1 in the Appendix. Models (1) through (3) include all sponsor-backed firms as well as non-backed firms, while models (4) through (6) include only majority sponsor backed firms (i.e., firms in which the sponsor's backing exceeded an ownership threshold of 50%) and non-backed firms. The standard errors are corrected for heteroskedasticity with the associated *t*-values given in parentheses. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	# post-IPO acq. – full sample			# post-IPO acq. – majority sponsors		
	(1)	(2)	(3)	(4)	(5)	(6)
	IPO + 1 yr	IPO + 2 yrs	IPO + 3 yrs	IPO + 1 yr	IPO + 2 yrs	IPO + 3 yrs
Sponsor backing						
PEBacked	0.199*	0.381**	0.564**	0.349***	0.633***	0.866***
	(1.940)	(2.256)	(2.372)	(2.676)	(2.967)	(2.808)
VCBacked	-0.084	-0.106	-0.153	-0.184	-0.477	-0.684
	(-1.094)	(-0.814)	(-0.802)	(-1.419)	(-1.625)	(-1.263)
Company characteristics						
Firm revenue	0.044*	0.114***	0.184***	0.113***	0.219***	0.299***
	(1.889)	(2.627)	(2.900)	(3.199)	(3.152)	(2.869)
Return on Assets	-0.038	-0.152	-0.176	-0.050	-0.198	-0.257
	(-0.691)	(-1.369)	(-1.170)	(-0.602)	(-1.355)	(-1.234)
Book leverage	-0.054	-0.151	-0.271	-0.019	-0.209	-0.329
	(-0.395)	(-0.695)	(-0.892)	(-0.102)	(-0.676)	(-0.748)
Market-to-book ratio	-0.006	0.015	0.037	-0.048**	-0.046	-0.016
	(-0.463)	(0.695)	(1.269)	(-1.966)	(-1.069)	(-0.256)
Financial slack	-0.270	-0.428*	-0.613*	0.100	-0.023	-0.154
	(-1.607)	(-1.747)	(-1.839)	(0.481)	(-0.066)	(-0.308)
Organic growth/assets	-0.341*	-0.887***	-1.072***	-0.581***	-1.248***	-1.498***
	(-1.867)	(-3.124)	(-2.684)	(-2.814)	(-3.477)	(-3.072)
Firm age at IPO	-0.036	-0.013	0.003	-0.054	-0.025	-0.030
	(-0.796)	(-0.165)	(0.029)	(-0.934)	(-0.245)	(-0.205)
IPO characteristics						
Primary proceeds	0.173***	0.305***	0.392***	0.084	0.181	0.292*
	(3.312)	(3.043)	(2.742)	(1.450)	(1.466)	(1.685)
M&A is IPO motive	0.308***	0.355***	0.512***	0.426***	0.518**	0.768***
	(3.910)	(3.073)	(3.208)	(2.963)	(2.502)	(2.690)
Underwriter reputation	-0.015*	-0.028**	-0.039**	-0.014	-0.028	-0.046
	(-1.949)	(-2.000)	(-2.007)	(-1.235)	(-1.237)	(-1.415)
Underpricing	0.001	0.003	0.004	0.001	0.002	0.005
	(1.031)	(1.217)	(1.426)	(0.521)	(0.612)	(0.929)
Offer price revision	0.001	0.003	0.001	0.002	0.006	0.004
	(0.889)	(0.936)	(0.300)	(0.899)	(0.839)	(0.522)
First 30-days post-IPO return	0.002	0.003	0.004	0.002	0.003	0.004
	(1.592)	(1.610)	(1.504)	(1.066)	(0.974)	(0.977)
Dual class share structure	-0.102	-0.083	-0.005	-0.032	0.052	0.157
	(-0.895)	(-0.418)	(-0.019)	(-0.236)	(0.208)	(0.411)
M&A characteristics						
Pre-IPO acquirer	0.483***	0.826***	1.220***	0.488***	0.758***	1.257***
	(5.262)	(5.614)	(5.925)	(3.222)	(3.107)	(3.656)
Industry acquisition intensity	0.084	0.388	0.519	0.198	0.410	0.500
	(0.488)	(1.484)	(1.596)	(0.987)	(1.452)	(1.404)
Constant	-0.653	-1.341*	-1.854	-0.553	-0.961	-1.434
	(-1.446)	(-1.690)	(-1.456)	(-1.048)	(-1.036)	(-0.977)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,071	1,071	1,071	564	564	564
R-squared	0.178	0.209	0.225	0.185	0.212	0.221

Table 6: Impact of initial sponsor backing on Capex and R&D expenditures

This table reports the cross-sectional regression coefficients using the natural logarithm of IPO firm *i*'s total Capex and R&D expenditures during the first (model (1)), the first and second (model (2)) and the first three (model (3)) post-IPO years as the dependent variable. The variables of interest are *PEBacked* and *VCBacked*, both defined as one if the IPO firm is either PE-backed or VC-backed, respectively, at the time of the IPO, whereby the sponsor's backing must exceed an ownership threshold of 25% in the IPO firm, and zero otherwise. The other variables are divided in company characteristics, IPO characteristics and M&A characteristics and are defined in Table A-1 in the Appendix. The standard errors are corrected for heteroskedasticity with the associated *t*-values given in parentheses. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Total CAPEX and R&D		
Independent variables	(1) IPO +1 year	(2) IPO + 2 year	(3) IPO + 3 year
Sponsor backing			
PEBacked	0.073	0.084	0.052
	(0.624)	(0.696)	(0.434)
VCBacked	0.123	0.234**	0.258**
	(0.962)	(2.036)	(2.239)
Company characteristics			
Firm revenue	0.142***	0.139***	0.135***
	(3.763)	(3.442)	(3.508)
Return on Assets	0.425**	0.547***	0.559***
	(2.484)	(2.922)	(3.005)
Book leverage	0.254	0.227	0.220
	(1.441)	(1.291)	(1.217)
Market-to-book ratio	-0.029	-0.016	0.000
	(-1.525)	(-0.840)	(-0.003)
Financial slack	0.952***	0.831***	0.652***
	(3.595)	(3.101)	(2.686)
Organic growth/assets	3.163***	3.074***	3.121***
	(7.447)	(7.010)	(8.094)
Age at IPO	-0.058	-0.079	-0.086
	(-1.127)	(-1.466)	(-1.603)
IPO characteristics			
Primary IPO proceeds	0.843***	0.843***	0.851***
	(12.600)	(11.977)	(12.599)
M&A is IPO motive	-0.045	-0.056	-0.039
	(-0.558)	(-0.679)	(-0.476)
Underwriter reputation	0.027***	0.025***	0.024***
	(3.371)	(3.085)	(2.936)
Underpricing	0.006***	0.005***	0.005***
	(3.347)	(2.955)	(2.891)
Offer price revision	-0.009***	-0.008***	-0.008***
	(-4.657)	(-4.098)	(-3.923)
First 30-days post-IPO return	0.004**	0.004**	0.004**
	(2.271)	(2.316)	(2.266)
Dual class share structure	-0.090	-0.051	-0.082
	(-0.757)	(-0.427)	(-0.668)
M&A characteristics			
Pre-IPO acquirer	0.180**	0.191**	0.210**
	(2.088)	(2.288)	(2.504)
Industry acquisition intensity	0.375*	0.384	0.382
	(1.674)	(1.543)	(1.613)
Constant	-1.078	-0.375	-0.085
	(-1.469)	(-0.484)	(-0.107)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	931	931	931
R-squared	0.613	0.611	0.615

Table 7: Impact of initial sponsor backing on the probability of selected deal characteristics

This table reports results of the logit regression for the IPO firm sample. The dependent variable is defined as one if the IPO firm engaged in at least one cross-border acquisition during its first three post-IPO years (model 1), engaged in at least one cross-industry acquisition during its first three post-IPO years (model 2) or engaged in at least one relatively large acquisition (defined as an acquisition for which the deal value exceeds 50% of the acquirer's revenue at the time of the IPO) during its first three post-IPO years (model 3), and zero otherwise. The variables of interest are *PEBacked* and *VCBacked*, both defined as one if the IPO firm is either PE-backed or VC-backed, respectively, at the time of the IPO, whereby the sponsor's backing must exceed an ownership threshold of 25% in the IPO firm, and zero otherwise. The other variables are divided in company characteristics, IPO characteristics and M&A characteristics and are defined in Table A-1 in the Appendix. The standard errors are given in parentheses. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	(1) Cross-border	(2) Cross-industry	(3) Relative size
Sponsor backing			
PEBacked	0.074	0.119	1.031**
	(0.260)	(0.420)	(2.280)
VCBacked	-0.535	-0.113	-0.164
	(-1.520)	(-0.330)	(-0.340)
Company characteristics			
Firm revenue	0.041	0.305***	-1.607***
	(0.390)	(2.780)	(-7.250)
Return on Assets	0.539	0.074	-0.608
	(0.670)	(0.090)	(-0.500)
Book leverage	0.081	-0.693	1.130
	(0.170)	(-1.400)	(1.410)
Market-to-book ratio	0.129**	0.016	-0.094
	(2.260)	(0.280)	(-1.370)
Financial slack	0.696	-0.132	-0.431
	(1.090)	(-0.210)	(-0.510)
Organic growth/assets	-0.616	-0.919	-1.756
	(-0.700)	(-1.070)	(-1.150)
Age at IPO	0.230*	0.027	-0.313
	(1.760)	(0.210)	(-1.640)
IPO characteristics			
Primary IPO proceeds	0.124	-0.059	1.183***
	(0.800)	(-0.370)	(4.290)
M&A is IPO motive	-0.105	0.636***	0.368
	(-0.460)	(2.780)	(1.190)
Underwriter reputation	0.023	-0.024	-0.047
	(0.940)	(-1.020)	(-1.350)
Underpricing	0.007	0.004	0.007
	(1.330)	(0.700)	(1.090)
Offer price revision	-0.017***	-0.001	-0.010
	(-2.690)	(-0.090)	(-1.090)
First 30-days post-IPO return	0.002	0.002	0.001
	(0.300)	(0.420)	(0.170)
Dual class share structure	0.000	-0.002	-0.053
	(0.000)	(-0.010)	(-0.130)
M&A characteristics			
Pre-IPO acquirer	0.070	0.092	-0.045
	(0.340)	(0.440)	(-0.160)
Industry acquisition intensity	0.143	-0.643	1.439
	(0.260)	(-1.060)	(1.550)
Constant	-3.370**	-0.850	3.421*
	(-2.190)	(-0.620)	(1.690)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	539	539	458
Pseudo R-squared	0.078	0.107	0.371

Table 8: Post-IPO bidder returns surrounding M&A announcements

This table reports the stock market reaction of newly public firms between 2001 and 2017 to M&A announcements during the first three years following their IPO, divided by backing group. The cumulative abnormal returns (CARs) are estimated for bidding firms over multiple event windows. Daily abnormal returns are obtained using the market-adjusted model with the Russel 3000 being used as the market portfolio. Average CARs are tested for statistical significance using the parametric *t*-test and median CARs are tested using the non-parametric Wilcoxon test. Differences between sample groups are tested for significance using the parametric two-sample *t*-test and the nonparametric Wilcoxon rank-sum test. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Event window	Average CAR	Median CAR	Average CAR	Median CAR	Average CAR	Median CAR
	PE-backed firms (n=776)		VC-backed firms (n=421)		Non-backed firms (n=465)	
[−2;+2]	0.74%***	0.50%***	1.67%**	0.11%	2.61%***	0.70%***
[−1;+1]	0.60%***	0.23%**	1.70%**	0.46%	2.17%***	0.89%***
[0;0]	0.26%**	0.05%*	0.85%	-0.03%	0.46%***	0.22%***
[−2;0]	0.23%	0.03%	0.83%	0.01%	0.67%***	0.40%***
[0;+2]	0.78%***	0.46%***	1.65%**	0.55%	2.30%***	0.60%***
Event window	Δ Average CAR	Δ Median CAR	Δ Average CAR	Δ Median CAR	Δ Average CAR	Δ Median CAR
	Difference PE-backed and VC-backed firms		Difference PE-backed and non-backed firms		Difference VC-backed and non-backed firms	
[−2;+2]	-0.94%	0.39%	-1.88%**	-0.20%	-0.94%	-0.59%*
[−1;+1]	-1.10%	-0.23%	-1.57%***	-0.66%***	-0.46%	-0.43%**
[0;0]	-0.59%	0.07%	-0.20%	-0.17%	0.39%	-0.24%*
[−2;0]	-0.60%	0.02%	-0.44%	-0.37%*	0.16%	-0.39%
[0;+2]	-0.88%	-0.08%	-1.53%**	-0.14%	-0.65%	-0.06%

Table 9: Post-IPO buy-and-hold abnormal returns

This table reports the buy-and-hold abnormal returns (BHARs) of newly public firms during the first twelve ($BHAR_{[0;12]}$), 24 ($BHAR_{[0;24]}$) and 36 months ($BHAR_{[0;36]}$) following their IPO, divided by backing group. Panel A shows the BHARs for all newly public firms, Panel B for firms that undertake at least one acquisition within the first three years following their IPO, Panel C for firms that do not engage in any acquisitions throughout the first three years of being public, and Panel D shows the difference between acquirers (Panel B) and non-acquires (Panel C), all subdivided by backing group. The market return is estimated using an equally weighted portfolio of up to five style-matched competitor firms. For the matched portfolio we utilize the text-based industry matching approach by Hoberg and Phillips (2010) and use those competitor firms with the highest similarity scores. Average BHARs are tested for statistical significance using the parametric *t*-test and median BHARs are tested using the non-parametric Wilcoxon test. Differences between sample groups are tested for significance using the parametric two-sample *t*-test and the nonparametric Wilcoxon rank-sum test. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Average BHAR	Median BHAR	Average BHAR	Median BHAR	Average BHAR	Median BHAR
Panel A: Buy-and hold abnormal returns by backing group						
	PE-backed firms (n=288)		VC-backed firms (n=452)		Non-backed firms (n=261)	
$BHAR_{[0;12]}$	8.57%***	5.40%**	2.62%	-5.98%	-0.64%	-6.13%**
$BHAR_{[0;24]}$	5.32%	-0.37%	-6.24%	-15.39%***	4.28%	-4.92%
$BHAR_{[0;36]}$	1.15%	-6.14%	3.80%	-21.93%**	-0.75%	-16.02%**
Panel B: Buy-and hold abnormal returns for acquirers by backing group						
	PE-backed firms (n=185)		VC-backed firms (n=176)		Non-backed firms (n=135)	
$BHAR_{[0;12]}$	12.08%***	6.86%***	1.91%	-10.24%	7.44%	1.78%
$BHAR_{[0;24]}$	13.11%***	6.07%**	5.66%	-16.24%	9.06%	2.51%
$BHAR_{[0;36]}$	4.46%	-6.37%	12.32%	-16.23%	0.22%	-8.13%
Panel C: Buy-and hold abnormal returns for non-acquirers by backing group						
	PE-backed firms (n=103)		VC-backed firms (n=276)		Non-backed firms (n=126)	
$BHAR_{[0;12]}$	2.25%	-3.34%	3.08%	-4.06%	-9.31%	-16.61%***
$BHAR_{[0;24]}$	-8.67%	-6.49%	-13.83%**	-14.90%***	-0.84%	-15.25%
$BHAR_{[0;36]}$	-4.81%	-5.91%	-1.63%	-29.21%***	-1.80%	-29.06%*
Panel D: Buy-and hold abnormal returns: difference between acquirers and non-acquirers by backing group						
	Δ Average	Δ Median	Δ Average	Δ Median	Δ Average	Δ Median
	PE-backed firms		VC-backed firms		Non-backed firms	
$BHAR_{[0;12]}$	9.83%	10.20%	-1.17%	-6.18%	16.75%*	18.39%*
$BHAR_{[0;24]}$	21.77%**	12.56%**	19.49%*	-1.34%	9.90%	17.75%**
$BHAR_{[0;36]}$	9.28%	-0.47%	13.95%	12.98%	2.01%	20.92%*

Appendix

Table A-1: Variable definitions and data sources

This table defines the regression variables and describes them in more detail, including an identification of their data source. The variables are divided into sponsor backing variables, as well as company characteristics, IPO characteristics and M&A characteristic variables.

Variable	Definition	Data source
Sponsor backing		
PEBacked	Binary variable defined as one if the IPO firm is backed by (a) PE sponsor(s) with a (cumulative) pre-IPO ownership stake that exceeds 25%, zero otherwise.	SDC, SEC EDGAR
VCBacked	Binary variable defined as one if the IPO firm is backed by (a) VC sponsor(s) with a (cumulative) pre-IPO ownership stake that exceeds 25%, zero otherwise.	SDC, SEC EDGAR
Company characteristics		
Firm revenue	Natural logarithm of the firm's revenues in million US dollars in the IPO year.	Worldscope
Return on Assets	Firm's net income in million US dollars divided by the firm's total assets in million US dollars in the IPO year.	Worldscope
Book leverage	Firm's interest-bearing debt in million US dollars divided by the firm's total assets in million US dollars in the IPO year.	Worldscope
Market-to-book ratio	Firm's market value of equity in million US dollars in the IPO year divided by the firm's book value of equity in million US dollars in the IPO year.	Worldscope
Financial slack	Firm's cash and marketable securities in million US dollars divided by total assets in million US dollars in the IPO year.	Worldscope
Organic growth/assets	Sum of firm's R&D and Capex expenses in million US dollars divided by total assets in million US dollars in the IPO year.	Worldscope
Firm age at IPO	Natural logarithm of the firm's calendar year of offering minus the firm's calendar year of founding.	SDC, Website of Jay Ritter (https://site.warrington.ufl.edu/ritter/files/founding-dates.pdf)
IPO characteristics		
Primary proceeds	Natural logarithm of capital raised during the IPO from sale of primary shares in million US dollars.	SDC
M&A is IPO motive	Binary variable defined as one if the IPO firm discloses M&A as a motive for going public, zero otherwise.	SDC
Underwriter reputation	Sum of proceeds from US IPOs in which leading book runner served as underwriter in IPO year divided by sum of proceeds from all US IPOs in IPO year.	SDC
Underpricing	Percentage change from the IPO offer price to the first day closing price.	SDC
Offer price revision	Percentage change from the midpoint of the original file price range to the actual offer price of the IPO.	SDC, SEC EDGAR
First 30-days post-IPO return	Cumulative returns of the issuer between days 1 and 30 after IPO (i.e., excluding first day returns).	SDC
Dual Class share structure	Binary variable defined as one if the IPO firm has employed a dual class share structure, zero otherwise.	SDC

M&A characteristics		
Firm is pre-IPO acquirer	Binary variable defined as one if IPO firm conducted a transaction within three years prior to the IPO, zero otherwise.	SDC
Industry acquisition intensity	Number of acquisitions within the Fama-French 49 industry portfolio divided by total firms in the Fama-French 49 industry portfolio in the year prior to the IPO.	SDC
Pre-IPO acquisitions	Number of acquisitions conducted by IPO firm within three years prior to the IPO.	SDC
Time to acquisition	Days between IPO and the acquisition announcement date.	SDC
Stock runup return (prv 30d)	Total stock return of acquirer in the last 30 days before acquisition (-32;-3) excluding the event study event window.	SDC
% of shares acquired	Percentage of shares acquired in the transaction.	SDC
Acquisition is cross-border	Binary variable defined as one if acquirer and target are located in different countries, zero otherwise.	SDC
Acquisition is cross-industry	Binary variable defined as one if acquirer and target are located in different Fama-French 49 industry portfolios, zero otherwise.	SDC, Website of Kenneth French (https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)
Target is public	Binary variable defined as one if target is publicly listed at the time of the acquisition, zero otherwise.	SDC
Firm is post-IPO acquirer (in first year)	Binary variable defined as one if IPO firm conducted an acquisition within its first year after going public, zero otherwise.	SDC

Online Appendix

The influence of initial investor backing on post-IPO acquisition activity

Table OA-1: Poisson regressions on post-IPO acquisition frequency

This table reports the cross-sectional Poisson regression coefficients using the IPO firm *i*'s number of post-IPO acquisitions as dependent variable. The variables of interest are *PEBacked* and *VCBacked*, both defined as one if the IPO firm is either PE-backed or VC-backed, respectively, at the time of the IPO, whereby the sponsor's backing must exceed an ownership threshold of 25% in the IPO firm, and zero otherwise. The other variables are divided in company characteristics, IPO characteristics and M&A characteristics and are defined in Table A-1 in the Appendix. Models (1) through (3) include all sponsor-backed firms as well as non-backed firms, while models (4) through (6) include only majority sponsor backed firms (i.e., firms in which the sponsor's backing exceeded an ownership threshold of 50%) and non-backed firms. The standard errors are corrected for heteroskedasticity with the associated *t*-values given in parentheses. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	# post-IPO acq. – full sample			# post-IPO acq. – majority sponsors		
	(1)	(2)	(3)	(4)	(5)	(6)
	IPO + 1 yr	IPO + 2 yrs	IPO + 3 yrs	IPO + 1 yr	IPO + 2 yrs	IPO + 3 yrs
Sponsor backing						
PEBacked	0.295*	0.294**	0.296**	0.500***	0.461***	0.434***
	(1.805)	(2.023)	(2.124)	(2.759)	(2.971)	(2.792)
VCBacked	-0.109	-0.048	-0.038	-0.495	-0.591	-0.459
	(-0.601)	(-0.328)	(-0.271)	(-1.162)	(-1.287)	(-0.801)
Company characteristics						
Firm revenue	0.199***	0.241***	0.254***	0.258***	0.295***	0.288***
	(2.868)	(4.155)	(4.555)	(3.328)	(4.084)	(3.931)
Return on Assets	0.253	0.091	0.200	0.381	0.505	0.526
	(0.758)	(0.424)	(0.891)	(0.683)	(0.972)	(1.140)
Book leverage	-0.199	-0.223	-0.254	-0.125	-0.255	-0.282
	(-0.789)	(-1.125)	(-1.366)	(-0.414)	(-1.001)	(-1.136)
Market-to-book ratio	0.006	0.033	0.043**	-0.110	-0.039	0.002
	(0.196)	(1.597)	(2.436)	(-1.565)	(-0.707)	(0.038)
Financial slack	-1.274***	-0.941***	-0.876***	-0.287	-0.717*	-0.860**
	(-3.393)	(-3.598)	(-3.726)	(-0.608)	(-1.711)	(-2.214)
Organic growth/assets	-0.999**	-1.273***	-1.033***	-1.155**	-1.585***	-1.299***
	(-2.236)	(-3.588)	(-3.054)	(-2.173)	(-3.504)	(-3.277)
Firm age at IPO	-0.086	-0.051	-0.038	-0.076	-0.039	-0.034
	(-1.245)	(-0.801)	(-0.616)	(-1.002)	(-0.541)	(-0.466)
IPO characteristics						
Primary proceeds	0.201**	0.143*	0.111	0.090	0.074	0.086
	(2.289)	(1.939)	(1.562)	(0.991)	(0.873)	(1.152)
M&A is IPO motive	0.777***	0.521***	0.512***	0.695***	0.547***	0.567***
	(5.256)	(4.457)	(4.746)	(3.634)	(3.294)	(3.673)
Underwriter reputation	-0.023	-0.023*	-0.021*	-0.020	-0.024	-0.027
	(-1.622)	(-1.710)	(-1.711)	(-1.148)	(-1.288)	(-1.487)
Underpricing	0.003	0.003	0.003	0.004	0.003	0.004
	(0.919)	(1.065)	(1.298)	(0.925)	(0.882)	(1.090)
Offer price revision	0.007*	0.006**	0.003	0.004	0.004	0.001
	(1.943)	(1.979)	(1.128)	(0.801)	(0.569)	(0.102)
First 30-days post-IPO return	0.004	0.003	0.002	0.005	0.003	0.003
	(1.495)	(1.461)	(1.173)	(1.478)	(1.213)	(0.995)
Dual class share structure	-0.165	-0.084	-0.044	0.006	0.062	0.081
	(-0.937)	(-0.619)	(-0.354)	(0.031)	(0.382)	(0.501)
M&A characteristics						
Pre-IPO acquirer	0.742***	0.639***	0.633***	0.536***	0.416***	0.487***
	(6.167)	(6.250)	(6.633)	(3.499)	(3.081)	(3.691)
Industry acquisition intensity	0.040	0.292	0.274	0.243	0.279	0.229
	(0.114)	(1.042)	(1.173)	(0.647)	(1.049)	(0.966)
Constant	-3.022***	-2.351***	-1.899***	-2.796***	-1.972**	-1.563**
	(-3.295)	(-3.187)	(-2.678)	(-2.831)	(-2.535)	(-2.130)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,071	1,071	1,071	564	564	564
Pseudo R-squared	0.217	0.228	0.245	0.201	0.233	0.247

Table OA-2: Regressions on post-IPO acquisition timing

This table reports the cross-sectional regression coefficients using the logarithm of the IPO firm *i*'s number of days until its first post-IPO acquisition as dependent variable. The variables of interest are *PEBacked* and *VCBacked*, both defined as one if the IPO firm is either PE-backed or VC-backed, respectively, at the time of the IPO, whereby the sponsor's backing must exceed an ownership threshold of 25% in the IPO firm, and zero otherwise. The other variables are divided in company characteristics, IPO characteristics and M&A characteristics and are defined in Table A-1 in the Appendix. The standard errors are corrected for heteroskedasticity with the associated *t*-values given in parentheses. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Days to first post-IPO acquisition
Sponsor backing	
PEBacked	-0.285**
	(-2.157)
VCBacked	0.087
	(0.629)
Company characteristics	
Firm revenue	-0.109**
	(-2.501)
Return on Assets	0.009
	(0.035)
Book leverage	-0.017
	(-0.080)
Market-to-book ratio	0.015
	(0.601)
Financial slack	0.293
	(1.103)
Organic growth/assets	0.828**
	(2.361)
Firm age at IPO	0.050
	(0.869)
IPO characteristics	
Primary proceeds	-0.068
	(-1.040)
M&A is IPO motive	-0.342***
	(-3.593)
Underwriter reputation	0.029***
	(2.866)
Underpricing	-0.002
	(-0.859)
Offer price revision	-0.008***
	(-3.039)
First 30-days post-IPO return	-0.008***
	(-3.211)
Dual class share structure	0.035
	(0.271)
M&A characteristics	
Pre-IPO acquirer	-0.527***
	(-5.686)
Industry acquisition intensity	-0.331
	(-1.590)
Constant	6.965***
	(12.902)
Year fixed effects	Yes
Industry fixed effects	Yes
Observations	736
R-squared	0.198

Table OA-3: Ordered logit regression on post-IPO acquisition frequency

This table reports the cross-sectional ordered logit regression coefficients using a categorical dependent variable that is zero if the IPO firm *i*'s number of post-IPO acquisitions is zero, one if the IPO firm i's number of post-IPO acquisitions is one and two if the IPO firm i's number of post-IPO acquisition is greater than one. The variables of interest are *PEBacked* and *VCBacked*, both defined as one if the IPO firm is either PE-backed or VC-backed, respectively, at the time of the IPO, whereby the sponsor's backing must exceed an ownership threshold of 25% in the IPO firm, and zero otherwise. The other variables are divided in company characteristics, IPO characteristics and M&A characteristics and are defined in Table A-1 in the Appendix. Models (1) through (3) include all sponsor-backed firms as well as non-backed firms, while models (4) through (6) include only majority sponsor backed firms (i.e., firms in which the sponsor's backing exceeded an ownership threshold of 50%) and non-backed firms. The standard errors are corrected for heteroskedasticity with the associated *t*-values given in parentheses. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	post-IPO acq. – full sample			post-IPO acq. – majority sponsors		
	(1)	(2)	(3)	(4)	(5)	(6)
	IPO + 1 yr	IPO + 2 yrs	IPO + 3 yrs	IPO + 1 yr	IPO + 2 yrs	IPO + 3 yrs
Sponsor backing						
PEBacked	0.325	0.373*	0.412**	0.617**	0.631**	0.545**
	(1.440)	(1.870)	(2.150)	(2.380)	(2.520)	(2.280)
VCBacked	-0.085	0.126	0.073	-0.241	-0.237	-0.543
	(-0.340)	(0.580)	(0.340)	(-0.430)	(-0.460)	(-1.130)
Firm revenue	0.204**	0.241***	0.260***	0.321***	0.327***	0.280***
	(2.350)	(3.130)	(3.370)	(3.150)	(3.330)	(2.640)
Return on Assets	0.213	0.164	0.226	0.283	0.936	1.061
	(0.640)	(0.600)	(0.760)	(0.740)	(1.250)	(1.600)
Book leverage	-0.081	-0.206	-0.170	-0.220	-0.551	-0.377
	(-0.240)	(-0.710)	(-0.620)	(-0.500)	(-1.340)	(-0.900)
Market-to-book ratio	0.019	0.046	0.046	-0.131	-0.085	-0.080
	(0.560)	(1.370)	(1.490)	(-1.590)	(-1.110)	(-1.190)
Financial slack	-1.704***	-0.936**	-0.460	-0.291	-0.392	-0.185
	(-3.550)	(-2.240)	(-1.100)	(-0.420)	(-0.590)	(-0.300)
Organic growth/assets	-1.657***	-2.063***	-2.135***	-1.912***	-2.688***	-2.772***
	(-2.930)	(-4.030)	(-3.950)	(-2.760)	(-3.860)	(-3.670)
Firm age at IPO	-0.115	-0.027	-0.002	-0.138	-0.025	0.000
	(-1.170)	(-0.280)	(-0.030)	(-1.200)	(-0.200)	(0.000)
Primary proceeds	0.173	0.142	0.154	0.066	0.164	0.183
	(1.430)	(1.280)	(1.390)	(0.470)	(1.210)	(1.280)
M&A is IPO motive	0.849***	0.598***	0.714***	0.638**	0.677***	0.786***
	(4.540)	(3.860)	(4.760)	(2.560)	(2.980)	(3.630)
Underwriter reputation	-0.028	-0.016	-0.014	-0.038	-0.033	-0.023
	(-1.600)	(-0.980)	(-0.880)	(-1.630)	(-1.470)	(-1.060)
Underpricing	0.001	0.000	0.001	-0.001	-0.005	-0.001
	(0.250)	(-0.020)	(0.280)	(-0.110)	(-0.770)	(-0.140)
Offer price revision	0.010**	0.011***	0.007*	0.006	0.005	0.002
	(2.200)	(2.620)	(1.710)	(1.060)	(0.750)	(0.370)
First 30-days post-IPO return	0.006*	0.002	0.003	0.005	0.001	0.001
	(1.770)	(0.750)	(0.970)	(1.200)	(0.410)	(0.380)
Dual class share structure	-0.143	0.045	0.213	0.212	0.261	0.310
	(-0.590)	(0.210)	(1.050)	(0.740)	(0.940)	(1.200)
Pre-IPO acquirer	1.021***	0.985***	1.009***	0.738***	0.700***	0.987***
	(6.170)	(6.330)	(6.460)	(3.210)	(3.140)	(4.310)
Industry acquisition intensity	0.001	-0.022	-0.331	0.275	0.160	-0.218
	(0.000)	(-0.050)	(-0.860)	(0.460)	(0.360)	(-0.550)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,071	1,071	1,071	564	564	564
Pseudo R-squared	0.163	0.162	0.175	0.139	0.173	0.184

Table OA-4: Post-IPO bidder returns surrounding M&A announcements using the market model

This table reports the stock market reaction of newly public firms between 2001 and 2017 to M&A announcements during the first three years following their IPO, divided by backing group. The cumulative abnormal returns (CARs) are estimated for bidding firms over multiple event windows. Daily abnormal returns are obtained using the market model event study approach, with an estimation period of *t*=-126, to *t*=-3, with t = 0 being the announcement day. Average CARs are tested for statistical significance using the parametric *t*-test and median CARs are tested using the non-parametric Wilcoxon test. Difference between sample groups are tested for significance using the parametric two-sample *t*-test and the nonparametric Wilcoxon rank-sum test. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Event Window	Average CAR	Median CAR	Average CAR	Median CAR	Average CAR	Median CAR
	PE-backed firms (n=627)		VC-backed firms (n=362)		Non-backed firms (n=377)	
[−2;+2]	0.54%**	0.17%**	1.43%	-0.42%	2.16%***	0.45%**
[−1;+1]	0.54%**	0.19%**	1.59%	-0.09%	2.09%***	0.56%***
[0;0]	0.26%**	-0.04%	0.89%	-0.13%	0.31%	0.10%
[−2;0]	0.14%	-0.12%	0.68%	-0.27%	0.44%*	0.25%*
[0;+2]	0.66%***	0.35%***	1.65%	0.17%	2.03%***	0.35%**
Event Window	Δ Average CAR	Δ Median CAR	Δ Average CAR	Δ Median CAR	Δ Average CAR	Δ Median CAR
	Difference PE-backed and VC-backed firms		Difference PE-backed and non-backed firms		Difference VC-backed and non-backed firms	
[−2;+2]	-0.89%	0.59%	-1.61%*	-0.28%	-0.72%	-0.87%**
[−1;+1]	-1.05%	0.28%	-1.56%**	-0.37%*	-0.51%	-0.64%**
[0;0]	-0.63%	0.09%	-0.05%	-0.14%	0.58%	-0.23%
[−2;0]	-0.53%	0.15%	-0.29%	-0.37%	0.24%	-0.51%
[0;+2]	-0.98%	0.18%	-1.37%*	0.00%	-0.39%	-0.18%

Table OA-5: Post-IPO buy-and-hold abnormal returns using market index as benchmark

This table reports the buy-and-hold abnormal returns (BHARs) of newly public firms during the first twelve ($BHAR_{[0;12]}$), 24 ($BHAR_{[0;24]}$) and 36 months ($BHAR_{[0;36]}$) following their IPO, divided by backing group. Panel A shows the BHARs for all newly public firms, Panel B for firms that undertake at least one acquisition within the first three years following their IPO, Panel C for firms that do not engage in any acquisitions throughout the first three years of being public, and Panel D shows the difference between acquirers (Panel B) and non-acquires (Panel C), all subdivided by backing group. The market return is estimated using the Russell 3000 Index. Average BHARs are tested for statistical significance using the parametric *t*-test and median BHARs are tested using the non-parametric Wilcoxon test. Differences between sample groups are tested for significance using the parametric two-sample *t*-test and the nonparametric Wilcoxon rank-sum test. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Variable	Average BHAR	Median BHAR	Average BHAR	Median BHAR	Average BHAR	Median BHAR
Panel A: Buy-and hold abnormal returns by backing group						
	PE-backed firms (n=363)		VC-backed firms (n=512)		Non-backed firms (n=358)	
$BHAR_{[0;12]}$	9.61%***	6.00%**	0.43%	-16.99%***	1.65%	-9.02%*
$BHAR_{[0;24]}$	6.02%*	-2.01%	-3.33%	-30.13%***	-0.65%	-21.30%**
$BHAR_{[0;36]}$	4.61%	-16.74%	-3.26%	-40.42%***	-7.49%	-39.47%***
Panel B: Buy-and hold abnormal returns for acquirers by backing group						
	PE-backed firms (n=223)		VC-backed firms (n=198)		Non-backed firms (n=169)	
$BHAR_{[0;12]}$	13.62%***	8.20%***	1.49%	-10.92%	8.87%	-2.77%
$BHAR_{[0;24]}$	12.94%***	6.69%*	13.58%	-14.20%	10.32%*	-3.80%
$BHAR_{[0;36]}$	9.10%	-9.83%	19.12%*	-29.90%	1.67%	-20.00%*
Panel C: Buy-and hold abnormal returns for non-acquirers by backing group						
	PE-backed firms (n=140)		VC-backed firms (n=314)		Non-backed firms (n=189)	
$BHAR_{[0;12]}$	3.22%	-1.30%	-0.24%	-20.76%***	-4.79%	-20.71%***
$BHAR_{[0;24]}$	-4.99%	-14.29%*	-14.00%***	-36.53%***	-10.46%	-37.23%***
$BHAR_{[0;36]}$	-2.55%	-30.65%**	-17.37%**	-56.82%***	-15.68%*	-55.56%***
Panel D: Buy-and hold abnormal returns: difference between acquirers and non-acquirers by backing group						
	Δ Average	Δ Median	Δ Average	Δ Median	Δ Average	Δ Median
	PE-backed firms		VC-backed firms		Non-backed firms	
$BHAR_{[0;12]}$	10.40%*	9.50%*	1.73%	9.84%*	13.66%*	17.94%**
$BHAR_{[0;24]}$	17.93%**	20.98%***	27.57%***	22.34%**	20.78%**	33.42%***
$BHAR_{[0;36]}$	11.65%	20.82%	36.49%***	26.92%***	17.35%	35.56%***

Table OA-6: Regression on post-IPO bidder CARs and BHARs

This table reports the cross-sectional regression coefficients using the IPO firm *i*'s cumulative abnormal announcement returns (CARs) during the [−2;+2] and [−1;+1] day event window in models (1) and (2) and the IPO firm *i*'s 36 months buy-and-hold return (BHAR) in model (3) as dependent variables. The variables of interest are *PEBacked* and *VCBacked*, both defined as one if the IPO firm is either PE-backed or VC-backed, respectively, at the time of the IPO, whereby the sponsor's backing must exceed an ownership threshold of 25% in the IPO firm, and zero otherwise. The other variables are divided in company characteristics, IPO characteristics and M&A characteristics and are defined in Table A-1 in the Appendix. Models (1) and (2) include all acquisitions announced by IPO firms during the first three years of their listings for which CARs are calculated as in Table 8. Model (3) includes all IPO firms on US stock exchanges from January 1, 2001 through December 31, 2017 for which BHARs for the post-IPO holding period of 36 months are calculated as in Table 9. The standard errors are corrected for heteroskedasticity with the associated *t*-values given in parentheses. *,**,*** indicate statistical significance at the 10%, 5% and 1% level, respectively.

	Bidder CARs		BHARs
	(1) [−2, +2]	(2) [−1,+1]	(3) [0;36]
Sponsor backing			
PEBacked	-0.008	-0.009	-0.048
	(-1.017)	(-1.461)	(-0.382)
VCBacked	-0.038*	-0.028***	0.040
	(-1.960)	(-2.721)	(0.300)
Company characteristics			
Firm revenue	-0.023*	-0.015***	0.080**
	(-1.647)	(-2.741)	(2.300)
Organic growth/assets	0.029	-0.003	0.271
	(0.724)	(-0.160)	(0.813)
Market-to-book ratio	-0.002	-0.001	0.098***
	(-1.041)	(-0.684)	(3.776)
Return on Assets			0.339*
			(1.785)
Book leverage			-0.546**
			(-2.043)
Financial slack			-0.222
			(-0.925)
Firm age at IPO			0.062
			(1.112)
IPO characteristics			
Primary proceeds	0.014	0.005	-0.064
	(1.201)	(1.267)	(-0.970)
Underwriter reputation	0.000	0.000	0.030***
	(-0.480)	(-0.545)	(3.281)
M&A is IPO motive	-0.020*	-0.013**	-0.069
	(-1.854)	(-2.117)	(-0.625)
Underpricing			-0.002
			(-0.891)
Offer price revision			-0.006**
			(-2.276)
First 30-days post-IPO return			0.003
			(1.343)
Dual Class share structure			0.384***
			(2.670)

M&A characteristics			
Time to acquisition	0.000*	0.000**	
	(1.926)	(2.117)	
Stock runup return (prv 30d)	-0.020	-0.024	
	(-0.722)	(-1.078)	
% of shares acquired	0.000	0.000	
	(1.008)	(1.046)	
Acquisition is cross-border	0.003	0.005	
	(0.442)	(1.119)	
Acquisition is cross-industry	-0.009	0.000	
	(-1.602)	(-0.079)	
Target is public	0.011	-0.003	
	(0.791)	(-0.273)	
Pre-IPO acquisitions	0.002**	0.002**	
	(2.007)	(2.421)	
Firm is pre-IPO acquirer			-0.041
			(-0.435)
Firm is post-IPO acquirer (in first year)			-0.067
			(-0.727)
Industry acquisition intensity	0.037**	0.032**	0.347
	(2.309)	(2.337)	(1.140)
Constant	0.097	0.039	0.099
	(1.519)	(1.174)	(0.156)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	1487	1487	821
R-squared	.081	.079	.127