Long Goodbyes: How do Private Equity Funds Manage Sell-Downs after Initial Public Offerings?

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Abstract

We analyze how private equity funds (GPs) sell down their stakes in companies they take public. GPs earn private equity management fees and carried interest on public equity holdings. The average duration of post-IPO holdings is 3 years, whereas lockups expire after 6 months. PE-backed IPOs perform well during the lockup, but we find no evidence that GPs add value for investors through the timing of their aftermarket sell-down strategies. GPs appear reluctant to sell losers, consistent with behavioral biases and agency effects. Long goodbyes are more likely when the fund is performing better, resulting in higher payments to GPs.

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I. Introduction

Public markets are an important exit route for private equity, but one which can take a surprisingly long time to complete. It is extremely rare for private equity (PE) funds to achieve total exit in an initial public offering (IPO), as public market investors are wary of buying shares from shareholders selling out completely. Since PE funds usually hold controlling stakes at the IPO, they are subject to lock-up periods – typically of six months – following an initial public offering, which delays further sales. Thereafter the general partners (GPs) of the fund have discretion over the sale of their remaining holdings. Once a company has gone public, each investor (the limited partners, or LPs) could conceivably make its own decisions as to whether to hold the stock. By retaining a holding within the PE fund for longer, the GP is imposing a long position on the LPs.[1] Furthermore, after the IPO, the PE fund is essentially earning private equity fees on public equity holdings. In this paper we detail GPs' sell-down strategies observed in a large sample of PE-backed IPOs using SEC filings, we test whether the LPs benefit from these strategies on a gross basis and net of the incremental management fees and carried interest paid to GPs, and we explore why GPs hold onto shares for so long.

We analyze U.S. IPOs of portfolio companies that were acquired in a leveraged buyout (LBO) by a PE fund. Muscarella and Vetsuypens (1990) and Cao and Lerner (2009) refer to such IPOs as 'reverse LBOs' and we call them 'PE-backed IPOs'. In recent years, as the size and number of LBO funds have grown, such IPOs have comprised around 25% of U.S. IPOs (Ritter 2020).[2] Our main data source for share sales is the Securities and Exchange Commission (SEC) Edgar database, and the launch of that service defines our data sample, along with a requirement that we allow up to 5 years to track the post-IPO sell-down. We find 330 PE-backed IPOs over the period 1995–2014 which had fully exited by the end of 2017. There were 564 holdings by private equity funds in these companies, reflecting the fact that, for the larger

[1] This position could be hedged, but not without cost.
[2] This proportion relates to IPOs during the period 2001−2019.

LBO transactions that we study, GPs often club together when acquiring the company. We then track subsequent share sales, dividends, and any recapitalizations until final exit.

The sell-down process varies significantly across deals, which suggests that GPs use their discretion over when to sell, rather than following a fixed rule. We find that only 3% of GPs exit fully at the IPO. In around half of transactions, the GPs sell some shares at IPO, but the median sell-down is less than 15% of their holding. In only 2% of the deals have GPs sold their entire holding within 4 weeks of the lock-up expiry. For nearly three-quarters of transactions, the exit route involves periodic block sales. On average GPs make 5.5 sales after the IPO, but the pattern and timing of the sell-downs vary considerably. The average duration of PE fund holdings, calculated using the time-weighted cash flows, is 2 years following the IPO. The sale of the final stake occurs, on average, nearly 3 years after the IPO (which is 2.5 years after the end of the lock-up period). However, behind this average lies a significant range. In around 25% of deals, GPs still retain around one-half of their holdings after 5 years. And some GPs hold onto stakes for over 10 years.

Having documented the sell-down process, we ask whether GPs add value for investors by their after-market sell-down strategy, i.e. by the timing and size of their disposals after the IPO.[3] We isolate this potential added value from any other benefit which GPs may bring to portfolio companies. GPs typically remain on the board of portfolio companies post-IPO.[4] In contrast to venture capital (VC) funds, which often continue to provide finance in the years following the IPO (Iliev and Lowry (2020)), LBO funds do not invest additional sums after the IPO.[5] During the sell-down period the GPs may add value by the strategic advice they provide as board members. However, it is impossible to observe the counterfactual of how decisions would have differed if the GPs were not on the board. This question is beyond the scope of the present paper, and we remain agnostic on whether GPs add continuing value through their voice on the

[3] We refer to 'aftermarket strategy' and 'aftermarket timing' interchangeably.
[4] In only 7% of deals do GPs not maintain a board seat while they remain a shareholder.
[5] In a few cases, GP stakes increase post-IPO due to stock dividends, exercise of warrants etc., but we do not see significant additional sums being invested in portfolio companies.

board, but rather we focus on any value added by their after-market sell-down strategy. However, we control for strategic value added by analyzing disposals while the GPs are still on the portfolio company's board.

The scope for GPs to add value to the fund by their sell-down strategy after the IPO may be both enhanced and limited by their status as insiders. Given the insights they have into their portfolio companies, GPs may be able to time disposals for the benefit of themselves and the LPs. If so, they may do a better job (after the lock-up restrictions have ended) of managing public equity than the LPs, or a public equity manager, could do. On the other hand, remaining on the board of the companies will restrict their freedom to trade, notably around announcement dates or if there is material non-public information (for instance regarding a potential takeover).[6] This constraint, together with the challenge any large block holder faces in disposing of listed shares, represents a potential cost of an IPO as an exit route, quite apart from the fees and money left on the table, in the form of a first-day return, when the shares are first floated. Once we have evaluated the performance of the actual sell-down, we compare this with plausible alternatives which could have been implemented, notably equal monthly sales over the period between the expiry of the lock-up and the final GP director exits the board.

We use SEC data to track the exact volume, price, and date of each share sale, and we calculate the actual gross returns earned by each GP after the IPO, taking the first day's close as our starting point.[7] The average investment multiple from this point to final exit is 1.13 and the IRR is 6.3%.[8] However, the mean (median) Kaplan-Schoar (2005) public market equivalent (PME) returns are 1.00 (0.96) relative to the Russell 2000 index and 1.04 (0.99) relative to the S&P 500. The results are qualitatively the same if we restrict the analysis to sell-downs which took place while GPs were on the board, as the usual practice is to remain on the board until the final share sale, or even beyond. Given that PMEs are not significantly above 1.00, we find no evidence that GPs add value, on a gross basis before accounting for their fees and carried

[6] One way for a GP to sell-down a stake while remaining on the board would be to set up a sale plan under SEC Rule 10b5. These can be established when the board member is not aware of any material non-public information and specify a plan to sell the stake down on a pre-arranged schedule.

[7] This is in line with the literature on this topic which commonly uses the closing price on the first trading day as a starting-point for post-IPO performance calculations; see Ritter (2015).

[8] Investment multiples for private equity deals are the ratio of total value (cash received plus any residual net asset value) to amount invested. For this calculation, we treat the IPO issue price as the amount invested.

interest payments, through the timing of their aftermarket sell-downs. We also estimate the GP Timing Track Record (Gredil, 2022) over a period consistent with a typical investment horizon for an LP and again find no evidence that GPs add value by their aftermarket timing.

During the post-IPO period, LPs continue to pay management fees and carried interest to GPs. Holding onto stakes longer results in higher management fees and, in our sample, higher carried interest payments. The former result is mechanical, but the latter largely reflects the rising stock market over our sample period, since on average these PE-backed LBOs perform broadly in line with the market. In effect, LPs are paying private equity fees on public equity holdings. We document that fees vary significantly depending on the speed of exit, with faster exits resulting in both lower management fees and lower carried interest payments.

We explore two alternative explanations for the sell-down patterns we observe: behavioral biases and conflicts of interest. We test for behavioral biases on the part of GPs in the form of the disposition effect, whereby they are more willing to realize profits than losses (Shefrin and Statman (1985)), and the anchoring effect, whereby the original IPO price serves as the dividing-line between profits and losses, even though this is only one disposal price among many in GPs' ownership of the portfolio company in question (Tversky and Kahneman (1974)) and is in any case economically irrelevant to their remaining holding. If the IPO price is taken as the dividing-line between "profit" and "loss", the disposition and anchoring effect would have the same result, which is to encourage sales above the IPO price and deter sales below. We find that disposals after the end of the lock-up period are larger (and more likely) when the share price trades above the IPO price, and smaller (and less likely) when the share price is below the IPO price, regardless of how the market has moved in the interim. GPs thus seem to anchor on the IPO price and hang on to their stakes if the price has fallen below this level, consistent with behavioral biases.

We also examine whether GPs' sell-down strategy is linked to the performance of the fund. If so, this would be consistent with a conflict of interest, since we should expect, in the absence of a conflict, that the sell-down strategy would be motivated entirely by the interests of the LPs. GPs charge an annual management fee, typically around 1–2% of the capital committed by the LPs for the first half of the fund's

life, after which the fee basis changes to the remaining capital invested (that is, net of any realizations). Shares in companies that have gone public are included as part of invested capital, albeit at cost rather than market value. In addition, GPs receive a 20% carried interest in the profits of the fund, subject (in most, but not all, cases) to the fund beating an internal rate of return (IRR) hurdle, which is normally 8%. If we find that the pattern of sell-downs is related to fund performance, the precise nature of the conflict can be interpreted differently depending on the results. If sell-downs take longer when fund performance is stronger, this would be consistent with GPs maximizing fees (and, during our sample period, riding a favorable market) when they are not under pressure to return cash to LPs, but not when poor fund performance pressurizes them to return cash to LPs. On the other hand, if sell-downs take longer when fund performance is weaker, this would be consistent with poorly-performing GPs retaining their listed holdings to keep open the possibility of earning carry if the IRR of the investment ends up above the hurdle. In either case, GP behavior would be consistent with an agency problem, in that the timing of disposals reflects the structure of the GPs' own compensation from the fund rather than the maximization of the performance of the fund itself. We find results that are consistent with the former outcome: the pace of sell-downs is slower the higher the fund's IRR and the greater the difference between the fund's IRR and the hurdle rate.

Our paper makes several contributions to the literature. The first is descriptive: the paper documents, based on SEC filings, the sell-down process for a large sample of US PE-backed IPOs, including important details such as the tenure of GPs on the board, share prices at each sale, and how value evolves for the investors between the LBO and IPO, and from IPO to exit. We also find an intriguingly low incidence of *in specie* distributions – where the shares are distributed directly to LPs – in comparison with VC exits.[9] Although the overall facts about the protracted sell-downs after IPOs are well understood, no previous paper has assembled such forensic and extensive data on all aspects of such PE-backed IPOs.

Second, early papers on PE-backed LBOs mostly focused on the IPO and short-term stock performance and on the longer-term operating performance and organizational structure of such deals (Muscarella and

[9] Given that these PE-backed IPOs are generally much larger than VC-backed IPOs, secondary market liquidity will generally be higher, thereby making it easier for LPs to trade any shares distributed to them.

Vetsuypens (1989, 1990)).[10] More recent research has started to analyze the post IPO performance of PE-backed firms, but none has tested whether GPs add value through their aftermarket sell-down strategies. Cao and Lerner (2009) study a sample of 526 companies floated by PE firms between 1981 and 2003 and find evidence of neutral to positive performance from a portfolio of PE-backed IPOs using a buy-and-hold strategy. Cao (2011) finds that PE funds are more likely to retain post IPO holdings in firms which have high cash flow, and more likely to reduce duration or sell stakes in companies with high stock valuations. However, while post-IPO buy-and-hold performance is a measure of GPs' stock selection and the value of any strategic advice through their participation on the board, it does not measure the post-IPO value added by GPs through the timing of disposals. We find, in line with Cao and Lerner (2009), that stocks held by GPs add modest value to LPs, but we also find that GPs add no value by their aftermarket sell-down timing.

Third, we document a reluctance on the part of GPs to sell below the IPO price which is consistent with both the disposition and anchoring effects. This result is in keeping with recent work by Akepanidtaworn et al. (2019) who analyze decisions by institutional managers of public-equity portfolios. They find that managers apply more skill to their buying than their selling decisions and they argue that this reflects either different psychological processes, with buying decisions being more belief-driven and forward-looking (compare Barber and Odean (2013) on the behavior of individual investors), or it reflects the selective allocation of limited cognitive resources. In our setting, as GPs' attention is dominated by investing in and adding value to new companies, they may overlook the holdings they still have in portfolio companies which are on the way out, or they may apply simple heuristics to disposing of them, most notably that of selling above the IPO price.

Finally, we test for conflicts of interest between GPs and LPs. Fund performance is negatively related to the pace of disposals, which is consistent with GPs taking advantage of the fact that LPs put less pressure on strongly performing funds to return cash to LPs but not when funds are performing more poorly. There are other potential tax-based hypotheses that may also explain this finding. For instance, it could be that the

[10] At that time, PE-backed IPOs were sometimes referred to as 'Second Initial Public Offerings', or 'SIPOs', as well as 'reverse LBOs'.

GPs, in respect of realising carried interest payments, or LPs who are not tax exempt, might favor a slower sell down. One limitation of the data is that we cannot observe separately the distributions to LPs and GPs (through their carried interest payments), which will often occur at different times, but this could be an interesting area for future research.[11]

The remainder of this paper is organized as follows. In section II we describe our data sources and sample. Section III analyzes the performance of the portfolio companies after the IPO, and the performance of the GPs in managing the sell-down process. We produce gross and net (of fees and carried interest) returns and quantify the costs of the actual sell-downs we observe relative to a simple hypothetical alternative approach. Section IV explores the factors that determine GP sell-downs. Section V concludes.

II. Data and sample description

A. Private equity backed IPOs

For our analysis we require a comprehensive sample of private equity LBOs which led to an IPO in the United States and for which we can track subsequent share sales. The SEC EDGAR database provides this level of detail but only for IPOs that took place after 1995. We also require a period after the IPO to track the subsequent sell-down, and so we limit our sample to IPOs that occurred by the end of 2014, which were the exit routes for LBOs that had taken place between 1990 and 2013. Our focus is on mature companies, rather than early-stage or growth companies, since we are interested in IPOs as a route to an exit, rather than as an intermediate financing event. As shown by Iliev and Lowry (2020), venture capitalists frequently invest further sums in a portfolio company after they go public, with the IPO allowing liquidity for founders, employees, and early investors. This could also be the case with companies backed by growth or expansion capital funds. We limit our focus to LBOs by applying two filters. First, we identify transactions that are flagged as LBOs by CapitalIQ and merge this with data on IPOs from SDC Platinum

[11] The order of payments to the LPs and GPs will be determined by the "waterfall" that is specified in the Limited Partnership Agreement.

and CapitalIQ. Second, we include a transaction only if it involves at least 50% debt (as a proportion of total enterprise value). This will exclude growth companies, as the typical capital structure applied by funds investing in such companies involves low levels of debt, thereby allowing the available cash-flow to be re-invested to fund growth.[12]

We gather information on, among other things, the date, enterprise value, and equity invested by the PE funds at the time of the LBO. We also track cash-flows between the LBO and IPO, such as dividends paid and shares redeemed, enabling us to produce information on the full life-cycle of these PE-backed IPOs. Details on the equity invested are needed to calculate the management fees that are charged after the investment period of the fund.[13]

In total there are 330 LBO/IPOs for which all the required data are available. For these transactions, there are 605 PE fund-deal pairs, reflecting the fact that funds frequently join forces to conduct an LBO. We exclude 41 that were still active as of January 2018. Our final sample therefore consists of 564 PE fund-deal pairs, involving 238 separate GPs and 330 IPOs that took place over the period 1995–2014, which had fully exited by 2017.[14] We check whether the cumulative effect of these various data filters introduces any biases in robustness checks in Section III.A.

Table 1 gives details of our sample. We track the companies after they go public, and in most cases the exit occurs via a series of share sales. We designate these cases the 'regular' sample. In addition, some companies are acquired before the PE fund has fully exited; we refer to this as the "M&A" sample. Finally, for 22 of the sample the exit was via Chapter 11.

[12] These filters are effective, as we observe no cases where the PE fund increases their shareholding significantly post-IPO, which would be necessary if they were financing growth.

[13] The typical fund partnership agreement defines an investment period of 4-5 years during which the GP charges management fees on the LPs' committed capital. After the investment period, management fees are usually charged on the basis of the remaining invested capital, and so the fee basis gradually reduces as investments are realized and the proceeds are returned to LPs.

[14] We identify a total of 10,790 LBOs between 1990 and 2013. The criteria for LBOs within that period to make our sample are (1) availability of Total Enterprise Value (TEV) and GP Equity invested at LBO, and (2) an IPO between 1995 and 2014. 851 PE fund-deal pairs satisfy these criteria. Excluding non-U.S. issuers and unit offerings leaves us with 676 PE-deal pairs. From these, we have to drop an additional 71 due to other missing data (financials, incomplete sales data etc.). 605 PE-deal pairs satisfy all criteria with full data availability. Of those, 41 PE-deal pairs were still actively invested after our sample period cutoff point of Dec. 31, 2017. Our core sample are therefore 564 fully exited PE-deal pairs. To link the IPO- and LBO information of each transaction, we read SEC filings at IPO (S-1/424B4) and, if possible, at LBO (for public-to-private deals) and during the lifecycle of the deal if the company has public debt outstanding and therefore publishes 10-K reports.

On average the stake held by all private equity funds in each company is about 80% of the total shares. In a few cases in which the private equity funds hold less than 50%, control over the company is exercised via voting rights granted by other investors. The great majority of shares floated in an LBO-backed IPO are primary shares, raising new capital that is mainly used to repay existing debt, as well as to redeem preference shares.[15]

We also track the board seats held by GPs on portfolio companies following the IPO. In around 85% of cases, the private equity fund(s) will have a board presence at the IPO and, as we shall show, this normally continues until – and sometimes well beyond – the sale of their final stake in the company.

B. The exit process

Tracking ownership changes as the PE owners sell down their stakes in the companies is a time-consuming and challenging task. For our sample this has involved hand-collecting data from several thousand SEC filings, in particular Form 4, Form SC-13 and Form DEF14A. Full details of the data that we extract from the various SEC filings is presented in Online Appendix 1. The distribution of our sample by date of LBO, IPO, and final exit is shown in Online Appendix 2 and Online Appendix 3 discusses the precision of the data that is available, in particular regarding the exact dates of sale transactions, which is important given the analysis we perform later.

Table 2 includes details of the deals from LBO to final exit. It should be recalled that our sample will contain a high proportion of successful deals, and so the summary statistics of this sample may well differ from the average deal in a fund. With that caveat in mind, the average period from initial LBO to IPO is 3–3.5 years. It is intriguing that the small set of companies that ultimately became bankrupt had noticeably quicker IPOs. The focus of our attention is on the post-IPO holding period which averages 2.7 years for those that continued as independent listed entities, and 3.2 years for those where the final exit for the PE

[15] There are a few exceptions to these rules, and in 17 cases a full exit was achieved at the IPO. These are unusual cases and are not the subject of our analysis.

fund occurred via an acquisition of their remaining stake. For the Chapter 11 sample, the post IPO holding period of the PE funds is much longer, averaging 4.8 years.

The exit process for GPs can start with selling a stake at the IPO. As Table 2 shows, we observe such sales in under half of our sample and, on average, these involve the GP selling around 20% of their holding. Thereafter, the remaining stake may be sold down in a succession of transactions, culminating either in a final 'exit sale' or in a distribution of the remaining stock to the LPs. On average, and including any sale at the IPO, we observe 5.5 sales for our regular sample, and 3.1 sales where the ultimate exit is an acquisition. For the regular sample, each transaction is on average for about 18% of the GP's holding, although the final 'exit' sale tends to be around twice as large. For those companies that are acquired, the exit transactions are much larger and less frequent. The gaps between share sales are, on average, lengthy: 259 (681) days for the regular (M&A) sample. As can be inferred from these statistics, a quick exit after the expiry of the lock-up is rare: in only 2% of deals does the GP completely sell down their stake, and in only 11% of the deals is any (partial) sell down, within 4 weeks of the lock-up.

Other interesting findings, also reported in Table 2, include the surprisingly negotiable nature of lock-up periods, as GPs manage to convince the underwriters to allow sales before the end of the lock-up period in 62 of the 564 GP-firm pairs. Such permission is only granted when the shares have performed strongly after the IPO, a result that is in line with the findings of Field and Hanka (2001) and Brav and Gompers (2003). We also find that in around 20% of club deals involving more than one GP, the share sales are clearly coordinated, in the sense that all invested GPs sell shares on the same date and for the same fraction of their holding. Furthermore, we find that *in specie* distributions of shares (that is, transfers of shares rather than the cash proceeds of share sales) play no important role in exit processes. 15.5% of all deals in the regular exit sample have an *in specie* distribution, and only 3.1% in the M&A sample (7.1% for Chapter 11). The total number of share distributions is even lower. As already shown in Table 1, of 2,726 separate share sale transactions across the full sample, only 200 (or 7.3%) are *in specie* distributions. As Table 2 shows, the average percentage of shares sold per transaction is at 9.9% for the regular exit sample. These

numbers are much lower than those reported by Gompers and Lerner (1998) for the venture capital industry in the 1980s and 1990s.

Table 2 reports sample averages which hide the considerable variation in how quickly sales occur post-IPO. This can be seen clearly in Figure 1, where we present how ownership evolves for the deals[16] with the fastest and slowest exits. The differences between the fastest and slowest quartiles are dramatic: GPs can exit their stakes within about a year of the IPO. On the other hand, many GPs retain significant stakes many years after the IPO. Whether the GP is acting in the interests of LPs in holding onto stakes for so long is a key question that we shall answer. In Online Appendix 4, we summarize, for the different sub-samples, the evolution of the shareholdings of GPs in the years after the IPO. Over half of all deals in the 'regular' subsample have not exited within the first two years after the IPO, and for one-quarter of these deals exit has not occurred within 4 years of the IPO. Some GPs still hold onto stakes for more than a decade after the firm goes public (as already shown by the longer overall exit processes, even fewer deals fully exit within the first years after the IPO in the M&A and Chapter 11 subsamples).

To provide further color on the types of exit strategy we observe in our sample, we include some case study examples in Online Appendix 5. These are representative of the range of strategies we observe, from a fast exit via a couple of large transactions, through systematic regular sales, to cases where there is no sell-down after the IPO for several years. We superimpose the share price onto these case studies, as our later analysis focuses on the returns to LPs, who could re-invest their money in other investments (such as the overall stock market) were the GPs to sell down their stakes and distribute the proceeds to the LPs. These examples also hint at the answer to our later analysis regarding the reasons that GPs may, in some cases, be reluctant to sell.

[16] When we refer to deals we always mean GP-portfolio company pairs. Therefore, when there are two or more GPs at the time of the IPO, we will treat them as separate deals, as they often have different sell-down strategies.

C. Board seats

The involvement of the PE funds is not limited to the role of shareholders, for they typically retain board seats after the portfolio company goes public. Drawing on SEC data, in Table 3 we show typical board sizes of 7–8, with around half the seats being occupied by GPs of the fund(s).[17] On average we find that GPs remain on the board for 2–3 years after the IPO. In the case where the final exit is an acquisition, this invariably results in any remaining GP directors resigning at the same time. However, the same is not true for those companies that remain independently listed: 42% of GP directors exit after the last share sale. This might hint at some personal attachment to the company and might indeed raise questions with LPs about potential future conflicts of interest. The continued board involvement of GPs will make them insiders in the firm and so limit the periods during which they can trade (and mainly sell) shares. On a full-sample level, these numbers show that 70% of all directors (761 out of 1087, excluding at-IPO exits) remain with the company at least until the final share sale. On a deal-level (not shown in Table 3) in only 7% (32 out of 478, excluding deals with full board exits at IPO) of deals does any GP retain a shareholding after the last GP director exits the board. We analyze whether continued board participation by a GP influences the speed of sell-down in our econometric analysis.

Having described our data, the remainder of the paper is focused on performance – of the portfolio companies post-IPO and of the GPs in their aftermarket sell-down strategies.

III. The performance of PE-backed IPOs and of GPs in managing the exit process

In this section we focus on three questions. First, we analyze how the companies that GPs take public perform. Our focus in this section is on performance *after* the IPO, to ascertain whether PE-backed IPOs perform well in absolute and risk-adjusted terms once they enter the public market. Second, by tracking each individual share sale after the IPO, we test whether GPs add value for LPs by the timing of their

[17] See Online Appendix 1 and 3 for details on the sources, and precision, of the information regarding boards of directors.

aftermarket sell-downs. Third, we estimate the net returns earned by investors, after management fees and carried interest, how these different sell-down strategies impact on net returns.

A. The performance of PE-backed IPOs

In this subsection we report on the buy-and-hold stock performance of portfolio companies between the IPO and final exit, that is, without the effect of any disposals in between. We take as our starting point the share price at the end of the first trading day. As has been well documented, IPOs are, on average, underpriced, which is a cost to LPs (and GPs).[18] However, the focus of this paper is not on how GPs manage IPOs, but on how they manage the disposals in the market thereafter. Accordingly, in common with prior literature on post-IPO performance (see Loughran and Ritter, 2002), we use the end of the first trading day as our reference point. If we were to use the IPO price, we would be measuring *both* the post-IPO performance of the shares *and* the IPO discount.

Table 4 presents various measures of performance over different periods. Starting in each case at the end of the first trading day, we divide the time following the IPO into the period from the end of the first trading day to the end of the lock-up period, and into the periods to the first, second, and third anniversaries of the IPO. In almost all cases the formal lock-up period is 180 days, but, as noted earlier, we see a significant number of cases where the underwriters use their discretion over the lock-up to allow GPs to sell earlier. This only happens if the share price rose strongly since IPO. For the moment, we take no account of the timing of GP sales over these periods; we simply track the performance of the 330 companies in our sample. If they cease to be listed the final return will be the final stock price on the day of delisting; therefore, the sample size gradually shrinks as the post-IPO period gets longer. In the last two columns of Table 4 we measure returns until the actual final exit date by the GP for the 564 GP-portfolio company pairs.

[18] For up-to-date details on the first-day returns of U.S. IPOs, see Jay Ritter's website at https://site.warrington.ufl.edu/ritter/ipo-data/

Simple raw monthly returns are positive, on average, over all periods, but performance tends to be strongest during the lock-up period. This may point to skepticism about the value of companies that are taken public by PE funds, as reflected in their initial trading price, followed over the subsequent few months by increasing valuations. In any case, returns stabilize at about 7–8% per year thereafter.[19] Buy-and-hold returns, with dividends reinvested, present a similar picture.[20] We find that, on average, the performance of these PE-backed IPOs is initially strong, especially during the lock-up period.

These raw returns also reflect the fact that U.S. stock markets were rising over the sample period. Therefore, in the next rows of Table 4 we re-calculate these performance measures relative to the S&P 500 and the Russell 2000 stock index. The latter index, comprising the smallest 2000 firms in the broad Russell 3000 index, may be a more appropriate benchmark for the performance of PE-backed IPOs given the typical mid-cap size of firms that PE funds acquire (as discussed by Harris, Jenkinson, and Kaplan (2016)). We also calculate Jensen's alphas and Fama-French 3-factor alphas.

We find, on average, that PE-backed IPOs outperform public markets, but mainly during the lock-up period. Monthly excess returns against the S&P 500 (Russell 2000) during the lock-up period average 1.33% (1.22%). This result is partly driven by a few very strong performers, but median excess returns are still 0.78% (0.66%) per month. Thereafter the outperformance drops away and median monthly excess returns become insignificant by the first anniversary of the IPO. Mean excess returns continue significantly to beat market indices, reflecting the skewed distribution of returns. By the time of final exit for the company-GP pairs, mean excess returns remain positive and significant, while median returns marginally outperform the S&P 500 and marginally underperform the Russell 2000. A similar pattern is found for buy-and-hold excess returns, with initial impressive gains during the lock-up period, which then fall away.

Alphas tell the same story, whether we use a single factor or three-factor model. Monthly mean (median) alphas using the Fama-French 3-factor model are 1.64% (1.48%) during the lock-up. Three years

[19] Note that the sample of firms changes as the window of analysis widens, since we can only track companies for as long as they remain on the market (and so are not the subject of M&A transactions or de-listed owing to bankruptcy).
[20] We are not aware that previous studies of post-IPO performance have documented superior performance between the IPO and the expiry of the lock-up; see Carter et al. (2011).

after the IPO, mean and median alphas are not significantly different from zero. However, performing over the longer term in line with public markets produced, over this sample period when markets were rising, significant absolute returns. Therefore, the incremental carried interest payments, post-IPO, on these retained stakes are likely to be significant. We estimate such payments in Section III.C.

Our evidence on the longer-term performance is similar to that in Cao and Lerner (2009). For their 1996−2003 sub-sample, they report slightly lower buy-and-hold raw returns of 8.53% and 11.01% in the 12- and 24-month period following the IPO, respectively. Over 36 months our returns are almost identical. A similar pattern is shown for Jensen's alphas: for the 12-month period they find slightly lower alphas at 0.41, and over 24 and 36 months their reported alphas of 0.37 and 0.23, respectively, are very close to those that we find. Ritter (2015) covers a sample of 987 buyout-backed IPOs from 1980 to 2012 and reports a buy-and-hold raw return of 33.5% and a market-corrected return of 2.7% across the 36 months following the IPO; the former is higher, and the latter is lower in comparison to our numbers.[21]

As a robustness check, since our analysis imposes significant data requirements resulting in many LBOs being dropped from the sample, we check whether there is any evidence of bias being introduced by the cumulative effect of the various data filters. We compile a sample U.S. PE-backed IPOs from Preqin and identify 337 additional companies that are not in our sample. For these companies the minimal requirement is share price information post-IPO. For this distinct sample we find similar performance results, which provides reassurance that our sample is representative; these results are presented in Online Appendix 6.

B. Gross returns after the IPO based on actual GP sell-down strategies

The results in the previous section track the performance of the companies after their IPO. After (and sometimes before) the end of the lock-up period, the GPs sell down their stakes and return the proceeds to the LPs. We now focus on how they manage this process.

[21] Other stock-related performance numbers which are not mentioned here are also comparable across the three papers. For example first-day returns are, on average, 8.9% in Ritter (2015), 12.88% in Cao and Lerner (2009), and 11.20% in our sample, as reported in Appendix 2. Hogan, Olson and Kish (2001) report average first-day returns of 7.64% for RLBOs between 1987 and 1998.

We construct metrics that mimic the way private equity performance is measured. As with the calculation of the share-price performance in Section III.A, we use as our starting-point the first-day's close, and we include disposals only of the shares held after the IPO, because we are interested in measuring the value added by the timing of these disposals (reflecting both the advantage and constraint that GPs face in being company insiders). For this sell-down period we construct the total value to paid in ratio (TVPI), which is often referred to as the investment multiple. The value of the shares held by the fund at the end of the first trading day serves as the paid-in capital in this calculation, and we track all subsequent cash-flows from sales until the final exit. We use SEC Form 4 share sale data to obtain the precise date and volume of each share sale. For all share sales beneath a 5% ownership threshold, we use either directors' Form 4 data or the GPs' SC-13 filings.[22] With these values and cash flows, we construct an internal rate of return (IRR) for each deal.[23] Additionally, we measure returns relative to public markets using the Kaplan-Schoar (2005) public market equivalent (PME) measure, with the S&P 500 and Russell 2000 as our benchmark indices. Finally, to check GPs' aftermarket timing abilities, we calculate the 'Timing Track Record' ('TTR') of Gredil (2022), also relative to the S&P 500 and Russell 2000 as benchmarks.

The results are presented in Table 5 Panel A. Across all deals the mean (median) investment multiple for the post-IPO holdings is 1.13 (1.06), which is consistent with the evidence on the performance of the portfolio companies once they go public. For the companies whose ultimate exit is by an acquisition, the overall investment multiple is slightly higher (at 1.20) than for those where the company remains independent and listed (1.17). Not surprisingly, companies that enter Chapter 11 deliver disappointing returns, losing 84 cents on the dollar. The fact that the full dollar is not lost reflects sell-downs before the companies enter Chapter 11.

The overall IRR over the period after the IPO is 6.3%. For the regular sample the returns are significantly higher (at 11.8%) than for the M&A sample (7.4%). Table 3 shows that the holding duration

[22] A detailed description of our data sources and the tracking of share sales is given in Online Appendix 1 and 2.
[23] This post-IPO IRR is not to be confused with the actual deal-level IRR we calculate based on all pre- and post-IPO cash flows, as is used later for deal fee calculations.

for the latter group is longer, but the lower IRR may also reflect poor initial performance before being acquired, with the PE fund holding on for such an exit. We shed more light on this pattern later.

Neither investment multiples nor IRRs control for movements in public markets, which, as we documented above, were generally rising through our sample period. Since the LPs could have reinvested any proceeds from sales of the stakes in these PE-backed IPOs in public markets, it is particularly relevant to benchmark the post-IPO performance against public market indices. The Kaplan-Schoar (KS) PME does this, using the precise dates of the cash-flows. Performance in line with public markets is reflected in a PME of 1.0. The results in Table 5 show that, following the IPO, the sell-down process resulted in returns across all deals very similar to those of public markets: a mean of 1.04 and 1.00 relative to the S&P 500 and Russell 2000, respectively, and a median of 0.99 and 0.96. Breaking the sample down by exit category, we find that the regular exits produce mean PMEs significantly above one, relative to the S&P 500 but there is no significant outperformance against the Russell 2000, which is likely to be a closer comparator group given the size of the private equity sample. Median returns are indistinguishable from public market performance. Deals that exited via M&A also produced PMEs very close to one with no statistical significance.[24]

Therefore, from the end of the first trading day, and taking account of the timing of the disposals, we find the returns to investors are very similar, on average, to those available from public markets. We also look for more direct evidence of added value by using the Timing Track Record (TTR) metric proposed by Gredil (2022).[25] Whereas PME abstracts from market timing, TTR focuses explicitly on that part of relative performance that relates to timing (in our case, timing of aftermarket disposals). For our time horizon we use, in one specification, the maximum of 3.5 years and the time to final exit and, in a second specification,

[24] Previous evidence on absolute and relative performance is mostly based on buyout fund-level cash flow data. Robinson and Sensoy (2016) measure a TVPI of 1.51, S&P-PME of 1.19 and IRR of 9% for a proprietary data set of 542 buyout funds (85% U.S.) over 1984-2010. Harris, Jenkinson, and Kaplan (2014) report a TVPI of 1.55 (2.02), S&P-PME of 1.27 (1.27) and IRR of 10.1% (17.5%) for the 2000s (1990s) using Burgiss data on 598 U.S. buyout funds. For a sample of 169 buyout funds in the Venture Economics database between 1980-2001, Kaplan and Schoar (2005) report a TVPI of 1.83, IRR of 18%, and S&P-PME of 0.97. Given that we measure deal- and not fund-level TVPIs, IRRs and PMEs using post-IPO cash flows only (thereby excluding all pre-IPO cash flows), our numbers are not directly comparable.

[25] In particular, we used equation (1) from Gredil (2002) in these calculations.

the maximum of the remaining fund life and the final exit. The periods of 3.5 years and of the remaining fund life were chosen as alternative ways to match a typical sell-down period that would be expected by LPs. In both specifications we measure the TTR against the S&P 500 and, separately, against the Russell 2000. As with PME, a value greater than 1 implies that value is being added by market timing, and a value of less than 1 implies the opposite. These market-relative results, displayed at the bottom of Table 5, Panel A, range from 0.94 to 1.06, with no statistical significance for either the mean or median returns, and are consistent with no value being added by the aftermarket sell-down strategy. Again it is important to recall that GPs, as large blockholding insiders, face constraints on when they can trade, which may be considered a cost of the IPO exit route. Finally, when measuring the TTR against the stock‘s own performance, we find no significant results at the median level. As for the means, there is evidence of value added across all deals. In the case of the Chapter 11 deals, the mean TTR against the stock's own performance is especially high, reflecting that fact that any early share sales will be credited as evidence of good timing for companies that ultimately enter Chapter 11. Across all the results in Panel A, our interpretation is that there is little evidence of significant value added through market timing on a market-relative basis, but that there is some evidence that funds have some timing ability relative to the stock's own return trajectory.

Throughout the paper we abstract from the pricing of the IPO (whether money is left on the table) and from the sales of shares by the GP at the IPO, as our focus is on the sell-down strategy of GPs after the IPO, not their decisions regarding the IPO itself. As a result, we use the first day's closing price and the post-IPO holding by GPs as the starting points for our analysis. This approach implicitly assumes that IPO first-day returns and the fraction of shares sold by the GPs do not covary. In Table 5, Panel B we show the rank correlations and covariances divided by variances between % of GP ownership sold at IPO and first-day returns, which indicate no significant correlation, supporting the decision to take the first-day's close as the starting point of our analysis of post-IPO holdings.

We also compute the correlations between GP ownership sold at the IPO and three measures of performance (TVPI, and the Kaplan-Shoar PME against the S&P500 and against the Russell 2000). We find that there is a significant correlation between the percentage of GP ownership sold at IPO and these

post-IPO performance measures, with better performing deals correlating with smaller stake sales at IPO. Although this paper focuses on sell-down decisions after the IPO, these correlations are at least consistent with GPs adding some value for investors in their IPO decisions by retaining larger stakes in companies which subsequently perform better. However, this is only a correlation and, in any case, the unpredictable component in public-market returns must be dominant. Finally, it should be recalled that these returns do not take account of the costs that PE funds charge for managing these public investments. In the next section we estimate the impact of these costs on net returns and explore whether there is evidence that alternative sell-down strategies would have produced better returns for investors.

C. Alternative sell-down strategies and net returns to investors

PE funds face two main constraints in their sell-down strategy. First, such stakes are subject to a lock-up period. Second, they typically hold sizeable stakes in the companies they take public and there may be limited market capacity to absorb a very large stake. The examples we document in Online Appendix 5 demonstrate a variety of different approaches, from a few quick block sales to a drip-feed approach. In this section, we start by documenting the gross returns earned by companies that chose fast and slow exit routes. Then we analyze how the sales process impacts on fees and carried interest payments, and hence net returns.

In Table 6 we start by estimating the gross returns earned on the deals, from the initial investment (before the IPO) to final disposal, taking account of the actual share disposals post-IPO. We adopt this approach since carried interest depends on overall profits and can only be estimated over the entire life of the investment. As can be seen from column 1, on average these PE-backed IPOs are very successful, with a gross multiple of over 4 and an IRR approaching 50%. The difference between mean and median returns reflects a few particularly successful deals.

We then consider these returns for the slowest and fastest sell-downs in columns 2 and 3. For the fastest quartile of deals full exit was achieved, on average, within 266 days of the IPO. In contrast, for the slowest quartile full exit did not occur until 2,268 days (over 6 years) after the IPO. The returns are clearly much higher for the quick exits than the long goodbyes. There could be many explanations for this pattern, but it

hints at post-IPO performance being a possible determinant of the sell-down strategy, with those deals that perform strongly after the IPO being sold more quickly. A potential limiting factor on the sale strategy could be the liquidity of the stock. We explore the determinants of holding periods and the timing and quantity of share sales in a regression framework in Section IV.

During the sell-down phase, GPs typically stay on the board of the company. As explained in section II.C, this is the case for 478 of our deals, and in most of these cases (93%), they depart the board after or at the time of their last share sale. We assume that any impact of having GPs involved in the company is coterminous with their period on the board. Therefore, in column 4 we calculate the actual returns earned on the N=478 sub-sample of deals that had a GP on the board post-IPO. As can be seen, the average performance is very similar to that of the full sample.

To test whether GPs add value through the timing of their aftermarket sell-downs, while controlling for the impact they had on the governance and value of the firm, we compare these actual returns with those produced by a simple sell-in-equal-installments strategy during the same period.[26] In column 5 we calculate the returns that would have been earned had the GP sold down in equal monthly amounts over their tenure on the board. There is little difference between the counterfactual and actual performance while GPs were represented on the board: gross investment multiples for equal installments sell-downs are, on average, slightly higher than those achieved for the period during which GPs were on the board, as are gross IRRs. This counterfactual is instructive as it controls for the impact of the continued strategic involvement of the GP in the company and so focuses on any value added by the timing of post-IPO sell-downs that could be a justification for the long goodbyes. We find no evidence of such value added.

Next, we consider the impact of management fees and carried interest payments on the net returns earned by LPs. The motivation for this is to understand why private equity funds continue to hold onto their public shareholdings for so long, and one potential reason is the fee structure. We evaluate the impact of

[26] We cannot entirely control for governance effects since the involvement of the GP might have been different in the case of an equal instalments sell-down.

long goodbyes on the payments to GPs, from LBO to final exit, and the net returns to LPs of the actual and simple counterfactual sell-down strategies.

The management fee is typically 1–2% per annum and is calculated as a fraction of the committed capital (i.e. the amount the LPs agree to invest in the fund, rather than the amount actually invested) during the defined investment period of the fund (typically the first five or six years) and as a fraction of the net invested capital thereafter, *including after a portfolio company goes public*. To track the net invested capital figure for LBOs we start with the initial equity invested in the deal. Then we adjust the initial amount invested over time (proportionately) for share sales as they occur. Thus, if the initial invested amount was $100, and the fund sold 20% of its stake at the IPO, the post-IPO opening basis for the fees would be $80. If they sold their remaining stakes in 4 equal tranches, the fee basis would step down to $60, $40, $20, and then 0. We compute management fees over time on this reducing net invested capital basis.

Management fees are not generally revealed, but we use data on fund terms from Preqin to estimate fee levels. The Preqin data on fund terms is anonymized, but we impute average management fees by fund size and vintage year and use these to approximate the fees charged by the funds in our sample. Clearly, long goodbyes involve more management fees being paid to GPs, as can be seen when we calculate management fees only for the post-IPO period.

Carried interest depends on the overall performance of the deal and the fund. Using Preqin, we find that most GPs are paid 20% of the total appreciation in the fund's value (after management fees) provided that an IRR hurdle of 8% is cleared. Figure 2 shows how the GPs' share in the appreciation of the fund depends on the fund IRR relative to the hurdle rate. We assume a full catch-up between 8% and 10%, that is, one in which the GPs earn 100% of the appreciation in fund value when the IRR stands between 8% and 10%, and 20% of its appreciation when the IRR is above that level. The monetary value of the fund's appreciation is measured in terms of the TVPI. Therefore, the (fund level) IRR determines whether carried interest is paid, and the TVPI defines how much.

We track the cash flows from LBO to final exit and impute a carried interest payment on a distribution if the deal has returned its invested capital plus the 'preferred return' associated with the hurdle rate. This

is in line with a U.S. waterfall, which we have assumed to apply (see Huther, Robinson, Sievers and Hartmann-Wessels (2020)).[27] As we do not have fund-level performance data for all funds, we assume that the fund has, overall, achieved its designated hurdle rate. Since this will tend to overstate carried interest, we impose a condition that works in the opposite direction, by counting carried interest payments only if the *deal* has an IRR over the hurdle at the time of the distribution. As a robustness check we recalculate the carried interest on the subset of funds where we know their returns, which suggests that our approach is conservative, given that most buyout funds generate carried interest payments.[28]

Our estimates of net returns are shown in Table 6, along with the average fees and carried interest per deal.[29] Given the private equity fee structure, it is no surprise that net and gross returns are significantly different: for instance, median investment multiples are about 0.6 lower after accounting for fees and carried interest. The mean (median) net multiple achieved across the whole sample is 3.25x (2.51x). This sits between the observed return on the fastest exits, 3.72 (2.96), and the slowest exits 2.76 (2.15). Focusing on the subset where the GP was on the board after the IPO, we find that the equal monthly installments sell down strategy, would have resulted in significantly higher mean investment multiples – on both a gross and net basis – and similar (slightly lower) IRRs. Median deal performance follows similar patterns but none of the differences are statistically significant.

Based on actual share sales, we estimate mean management fees and carried interest payments from LBO to final exit at $19.65m and $72.59m, respectively, resulting in total payments to the GPs of $92.21m. Medians are a lot smaller, reflecting the right skew in the distributions of holding periods and returns. However, for the fastest quartile of exits, the fees and carried interest payments are much lower, resulting in mean total payments of $39.11m. In contrast, the slowest exits generate fees and carried interest that sum to over $120.77m, even though gross returns on these deals are the lowest. When calculating the total

[27] Our data set does not allow us to calculate the results on the basis of a European-style waterfall.
[28] See Online Appendix 7. There are 413 deal involvements where Preqin report performance data. We find that for this sub-sample the average fees are somewhat higher per deal than using our algorithm, which requires the deal to be above the hurdle at the time of the distribution but does not impose a fund-level hurdle.
[29] For the representative sample of deals in Online Appendix 5 we state our estimates of the quantities for the management fees and carried interest, along with the implied percentage of gross distributions that these represent. For one of those deals we detail in Online Appendix 8 all of the cashflows with an explanation of how these make up the totals for that transaction.

management fees as a proportion of the total distributions over the life of the deal, we find significant differences in the management fee percentages. The carried interest percentage is higher for the quick exits, reflecting their better average performance.[30]

If we focus on the sample where the GP continues to be involved, we find that the equal installments sell-down would have resulted in significantly lower management fees, and similar carried interest payments. Overall, mean payments would have been insignificantly different under this trading strategy, while median payments to the GP would have been significantly lower. We conclude that the outcome of an equal installments disposal strategy while the GPs were represented on the company's board would have been roughly in line with that of the actual strategy during the same period. It is, of course, possible that GPs add value in ways that are not observable; for example, they may time their sales for less market impact (and therefore a better price) than would have been possible using an equal installments strategy. However, none of the evidence in the current section (or using the performance measures in the previous section) leads us to reject the null hypothesis that GPs add no value for LPs through their aftermarket sell-down strategies.[31]

Finally, as previously noted, it is impossible to know whether the performance of the firm would have been better (or indeed worse) had the GP sold down their stake more quickly and left the board at that point. Investors will form expectations about likely GP tenure and any anticipated value added would be compounded into the IPO issue price. The only paper to consider this issue (Fuerth and Rauch (2015)) found no impact of unanticipated PE fund director exits on share prices. However, if LPs receive any value from GPs in return for the fees they pay after the IPO, that value must be in the form of a better share price performance since, as we have found, it does not come from the timing of post-IPO disposals.

[30] Management fees are charged on committed capital during the investment period and on invested capital after that, as explained earlier.

[31] We explore various other hypothetical disposal strategies – including replicating the slowest and fastest quartile of disposals observed in our sample – in Online Appendix 9. We also consider how the results change if the starting point for the analysis is the end of the lock-up period.

IV. What explains GPs' sell-downs after IPO?

In this section we explore the factors that may influence the aftermarket sell-down strategies of GPs. Specifically, we test for behavioral biases on the part of the GP – which we refer to as the issue-price hypothesis – and for conflicts of interest between the GP and LPs.

For the issue-price hypothesis, we use the IPO price as a reference and analyze the extent to which post-IPO duration is explained by the share price performance in relation to this price. Prior literature shows that investors often rely on salient reference prices in their trading behavior. For example, Loughran and Ritter (2002) argue that the IPO price is used as a reference point by executives when computing their own gains and losses, even though that level may be different from the executives' in-costs.[32] Moreover, in line with previous empirical research on prospect theory and the disposition effect (e.g. Shefrin and Statman (1985), Odean (1998), Grinblatt and Keloharju (2001), Grinblatt and Han (2005)), as well as the anchoring effect (e.g. Tversky and Kahneman (1974)), GPs would be more likely to sell shares above the IPO price (winners) than below the IPO price (losers). We hypothesize that stocks with worse post-IPO performances relative to the IPO price should therefore trigger longer post-IPO durations.[33]

For the conflicts of interest hypothesis, we test whether sell-downs are a function of the performance of the fund at the time of the sale. Here the null hypothesis is that the current fund IRR has no bearing on disposals, as we should expect if GPs were focused solely on the interests of the LPs. Rejecting the null hypothesis points to a conflict of interest between GPs and LPs, although the nature of that conflict can be interpreted differently depending on the results. If sell-downs are slower when funds perform better, this is consistent with GPs maximizing fees (and, during our sample period, riding favorable market conditions) when they are not under pressure to return cash to LPs, but not when poor fund performance pushes them to return cash to LPs. By contrast, if sell-downs are slower when funds perform weakly this is consistent

[32] Pricing reference points have been identified in other areas of finance, too, e.g. in M&A the 52-week high (Baker, Pan and Wurgler (2012)) and in seasoned equity offerings the stock price at which CEOs joined the company (Baker and Xuan (2016)).
[33] It may be that GPs are aware of the irrelevance of the IPO price to the timing of disposals, but impute to other parties a belief in its importance. The other parties could include potential investors in a follow-on fund to whom the GPs wish to present positive information about the old fund. In this case, behavioral and agency effects are combined.

with GPs keeping their listed holdings when the fund IRR is low to avoid destroying the potential for the IRR to clear the hurdle. In either case, GP behavior is consistent with an agency problem, namely, that the timing of disposals reflects the structure of the GPs' own compensation from the fund rather than the maximization of the performance of the fund itself.[34]

Another potential source of GP-LP conflict could be tax optimization on the part of the GP. In the case of portfolio companies that have generated very large capital gains, the GP may seek to manage sell-downs to manage their tax liability, arising from their carried interests. Evidence in Online Appendix 10 shows that share sales are noticeably higher in May, November, and December – near the end of many tax years – which suggests that taxes could be a factor. To investigate this properly, it would be necessary to track the sales of GP entities individually, and the necessary data is not generally available. However, this is a potentially fruitful area for further investigation, especially with the more recent introduction of 'continuation vehicles' that allow GPs to roll successful portfolio companies into a new fund entity, as an alternative to an IPO.

We test the issue-price and the conflicts of interest hypotheses by using monthly data to analyze the quantity of shares sold per month from IPO to exit using a tobit model. In testing these hypotheses, we control for other variables which might also have a bearing on individual share sales. One category comprises market-related variables apart from the relationship of the stock price to the IPO price we are testing for. Following the broad literature on stock trading volumes (e.g. Lee and Swaminathan (2000), Chordia and Swaminathan (2000), Chae (2005), or Statman, Thorley and Vorkink (2006)), we measure trading liquidity as the daily volume of shares traded (excluding the GPs' shares traded), normalized by the number of locked up shares at IPO. We also control for the EV/EBITDA multiple of the Russell 2000 and monthly U.S. LBO volumes.

[34] A conflict of interest is not the only plausible explanation consistent with GPs holding onto losers. It is arguably more difficult to dispose of these shares without greater price impact. Also, the GPs may be actively seeking an acquirer for the firm. We discuss these alternatives below.

The second category of controls are portfolio company variables. Given the relationship which has been identified between operational performance and the decision to go public (Degeorge and Zeckhauser (1993), Holthausen and Larcker (1996)), it is possible that the relationship between operational performance and post-IPO sell-down needs to be controlled for as well. To capture this effect, we control for the financial and operational success of the company through the EBIT Margin and post-IPO dividend payments.

Finally, we control for deal features which might influence the exit decision of a GP, namely whether the board had exited the portfolio company at the time and whether the was a sell-down by a co-investor in the same month. Full details on the sources and definitions of all these cross-sectional variables are given in Appendix 1, and summary statistics for the variables are presented in Appendix 2 of this paper.

The results of the multivariate tobit regressions are presented in Table 7, in which the dependent variable is the volume of sell-downs in each month for each portfolio company. The model in column 1 focuses on the issue price hypothesis, where we find that the monthly amount of stock sold is driven mainly by whether the share price is above the IPO issue price, with some weak evidence that volumes are greater after share price run-ups (over the prior month). We control for liquidity using a continuous variable measuring monthly stock trading volume (excluding GP trades). When trading volume is high, the sell-down volumes increase. We find a strong positive correlation, as would be expected, between sale volumes and board exits. When we add fund performance measures, which reduces the sample by around two-thirds as we are not able to source data on fund performance for many funds, the monthly volumes remain largely unchanged and the significance of the share price being above the IPO price remains constant. GP and portfolio company fixed effects (model 2) reduce the coefficient on the variable stock price above IPO price, as do share sales by co-investors (models 6 and 7), but the significance remains at the 1% level. In models 3–5 we introduce fund performance variables (on a smaller sample size), in order to test the conflicts of interest hypothesis. Here we find that both the IRR minus the hurdle rate and the level of the fund IRR

are significantly and negatively related to fund performance, while the fund being in carry makes little difference.[35]

In the Online Appendix we run two further regressions with results largely in line with those of Table 7. In Online Appendix 11 we show the results of a probit regression with the same variables as in Table 7, while in Online Appendix 12 we show the results of cross-sectional regressions, in which we regress the (weighted) duration of post-IPO holdings on the stock price and on fund performance. In line with the tobit and probit regressions, this shows that fund duration is negatively associated with the level of the stock above the IPO price and positively associated with strong fund performance.

Overall, our results indicate that there is an issue price effect: GPs sell more of their winners and hold onto more of their losers, consistent with the disposition and anchoring effects. There is also evidence for a conflict of interest, in that sell-down volumes are negatively associated with better fund performance. This is consistent with GPs keeping their post-IPO holdings when they are not under pressure to return cash to LPs and (during our sample period) profiting from a rising market.

V. Conclusions

This paper documents a surprising feature of IPOs conducted by private equity funds: many GPs sell down their holdings slowly, and, in extreme cases still hold stakes a decade after the IPO. In this paper we investigate the impact of this on LPs. Whilst there are some obvious constraints on when, and how quickly, the GP can sell-down the holding – notably lock-up periods, periods when insiders are restricted from trading, and market liquidity – we use this public environment, where evidence can be sourced from the SEC and market data, to investigate the post-IPO sell-down activity of private equity GPs.

[35] We perform additional robustness checks in Online Appendix 13 to control for so-called 'blackout' periods during which company insiders with access to Material Non-Public Information ('MNPI') are not allowed to trade shares. While all regression results are confirmed in these tests, we do find that – in line with the legal restrictions on share sales during 'blackout' periods – the announcement of 'MNPI' events, such as M&A transactions, significantly reduces the probability of share trades during and following the announcement months.

We calculate the gross returns earned by each GP after the IPO from the first day's close to final exit. Using investment multiples, IRRs, Kaplan-Schoar (2005) public market equivalent returns, or Timing Track Records (Gredil, 2022), we find no evidence to reject the null hypothesis that GPs fail to add value by the timing of their aftermarket disposals. This result holds if we confine the observation period to the time when GPs remain on the board of the portfolio company, allowing us to control for the time when they are company insiders. We come to the same conclusion by comparing the GPs' actual sell-down strategy with a mechanical sale in equal monthly instalments over the period from the first day's close to final exit or (to control for any insider benefits enjoyed by the GPs) for as long as GPs are represented on the company's board).

When we investigate the pattern of sell-downs, we find evidence consistent with both a behavioral bias in GPs and an agency problem. Post-IPO disposals are greater when the share price is above the IPO price, consistent with both the disposition effect and the anchoring effect. As for conflicts of interest, the pace of disposals is a function of the performance of the PE fund itself, as opposed to the interests of LPs, in that the speed of disposals are negatively related to fund performance. This result is consistent with GPs maximizing management fees and (during the sample period when markets were rising) carried interest when there was less pressure on them to return cash to LPs, but not being able to exploit this possibility when poorer fund performance put them under pressure to do so.

The obvious question that this research raises is: should GPs continue to earn carried interest and management fees on holdings of public equity for prolonged periods? After all, mutual fund managers that include the same companies in their portfolios do not take home 20% of any absolute returns, and generally earn far lower management fees. Although we have found evidence consistent with GPs adding no value by the timing of their aftermarket disposals, it is possible that the extra fees incurred by LPs during the long goodbyes are the price paid for having GPs advise the portfolio company and potentially increasing the share price. This strategic benefit cannot be accurately measured, as the counterfactual, in which the GPs exit at the expiry of the lock-up, is unobservable. However, the current paper provides at least part of the answer, by finding that there is no evidence that GPs add value in the management of their post-IPO sell-

downs. In the absence of such added value, the effect of long goodbyes on LPs is a straight trade-off between the possible beneficial impact of GPs on the share price during the holding period and the cost of paying private equity fees for the management of public equity.

References

Akepanidtaworn, Klakow, Rick Di Mascio, Alex Imas, and Lawrence Schmidt, 2019, Selling fast and buying slow: Heuristics and trading performance of institutional investors, Working Paper.

Ang, Andrew, 2014, *Asset Management. A Systematic Approach to Factor Investing*. Oxford: Oxford University Press.

Axelson, Ulf, Per Stromberg, and Michael Weisbach, 2009, Why are buyouts levered? The financial structure of private equity funds, *Journal of Finance* 64, 1549-1582.

Axelson, Ulf, Tim Jenkinson, Per Stromberg, and Michael Weisbach, 2013, Borrow cheap, buy high? The determinants of leverage and pricing in buyouts, *Journal of Finance* 68, 2223-2267.

Baker, Malcolm, Xin Pan, and Jeffrey Wurgler, 2012, The effect of reference point prices on mergers and acquisitions, *Journal of Financial Economics* 106, 49-71.

Baker, Malcolm, and Yuhai Xuan, 2016, Under new management: Equity issues and the attribution of past returns, *Journal of Financial Economics* 121, 66-78.

Barber, Brad M., and Terrance Odean, 2013, The behavior of individual investors, *Handbook of the Economics of Finance 2*, 1533–1570.

Barber, Brad M., and Ayako Yasuda, 2017, Interim fund performance and fundraising in private equity, *Journal of Financial Economics* 124, 172-194.

Brav, Alon, and Paul A. Gompers, 2003, The role of lockups in initial public offerings, *Review of Financial Studies* 16, 1-29.

Brown, Gregory W., Oleg R. Gredil, and Steven N. Kaplan, 2019, Do private equity funds manipulate reported returns?, *Journal of Financial Economics* 132, 267-297.

Cao, Jerry X., 2011, IPO timing, buyout sponsors' exit strategies, and firm performance of RLBOs, *Journal of Financial and Quantitative Analysis* 46, 1001-1024.

Cao, Jerry X., and Josh Lerner, 2009, The performance of reverse leveraged buyouts, *Journal of Financial Economics* 91, 139-157.

Carter, Richard B., Frederick H. Dark, Ioannis V. Floros, and Travis R. A. Sapp, 2011, Characterizing the risk of IPO long-run returns: The impact of momentum, liquidity, skewness, and investment, *Financial Management* 40, 1067-1086.

Chae, Joon, 2005, Trading volume, information asymmetry, and timing information, *Journal of Finance* 60, 413-442.

Chordia, Tarun, and Bhaskaran Swaminathan, 2002, Trading volume and cross-autocorrelations in stock returns, *Journal of Finance* 55, 913-935.

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

Degeorge, Francois, and Richard Zeckhauser, 1993, The Reverse LBO decision and firm performance: Theory and evidence, *Journal of Finance* 48, 1323-1348.

Demiroglu, Cem, and Christopher M. James, 2010, The role of private equity group reputation in LBO financing, *Journal of Financial Economics* 96, 306-330.

Field, Laura Casares, and Gordon Hanka, 2001, The expiration of IPO share lockups, *Journal of Finance* 56, 471-500.

Fuerth, Sven, and Christian Rauch, 2015, Fare thee well? An analysis of buyout funds' exit strategies, *Financial Management* 44, 811-849.

Gompers, Paul A., 1994, Grandstanding in the venture capital industry, *Journal of Financial Economics* 42, 133-156.

Gompers, Paul A., and Josh Lerner, 1998, Venture capital distributions: Short-run and long-run reactions, *Journal of Finance* 53, 2161-2183.

Gompers, Paul A., Steven N. Kaplan, and Vladimir Mukharlyamov, 2016, What do private equity firms say they do?, *Journal of Financial Economics* 121, 449-476.

Gredil, Oleg R., 2022, Do private equity managers have superior information on public markets? *Journal of Financial and Quantitative Analysis* 57, 321-358.

Grinblatt, Mark, and Matti Keloharju, 2001, What makes investors trade?, *Journal of Finance* 56, 589-616.

Grinblatt, Mark, and Bing Han, 2005, Prospect theory, mental accounting, and momentum, Journal of Financial Economics 78, 311-339.

Guo, Shourun, Edith S. Hotchkiss, and Weihong Song, 2011, Do buyouts (still) create value?, *Journal of Finance* 66, 479-517.

Harris, Robert, Tim Jenkinson, and Steven Kaplan, 2016, How do private equity investments perform compared to public equity? *Journal of Investment Management* 14, 1-24.

Hogan, Karen M., Gerard T. Olson, and Richard J. Kish, 2001, A comparison of reverse leveraged buyouts and original initial public offers: Factors impacting their issuance in the IPO market, *Financial Review* 38, 1-18.

Holthausen, Robert W., and David F. Larcker, 1996, The financial performance of reverse leveraged buyouts, *Journal of Financial Economics* 42, 293-332.

Hu, Jianfeng, 2014, Does option trading convey stock price information, *Journal of Financial Economics* 111, 625-645.

Huang, Rongbing, Jay R. Ritter, and Donghang Zhang, 2016, Private equity firms' reputational concerns and the cost of debt financing, *Journal of Financial and Quantitative Analysis* 51, 29-54.

Huther, Niklas, David Robinson, Sonke Sievers, and Thomas Hartmann-Wessels, 2020, Paying for performance in private equity: Evidence from management contracts, *Management Science* 66, 1756-1782.

Iliev, Peter, and Michelle Lowry, 2020, Venturing beyond the IPO: Financing of newly public firms by venture capitalists, *Journal of Finance* 75, 1527-1577.

Kaplan, Steven, and Antoinette Schoar, 2005, Private equity returns, persistence, and capital flows, *Journal of Finance* 60, 1791-1823.

Lee, Charles M. C., and Bhaskaran Swaminathan 2000, Price momentum and trading volume, *Journal of Finance* 55, 2017-2069.

Lerner, Josh, 1994, Venture capitalists and the decision to go public, *Journal of Financial Economics* 35, 293-316.

Lin, Timothy H., and Richard L. Smith, 1998, Insider reputation and selling decisions: The unwinding of venture capital investments during equity IPOs, *Journal of Corporate Finance* 4, 241-263.

Loughran, Tim, and Jay Ritter, 2002, Why don't issuers get upset about leaving money on the table in IPOs?, *Review of Financial Studies* 15, 413-443.

Muscarella, Chris J., and Michael R. Vetsuypens, 1989, The underpricing of "second" initial public offerings, *Journal of Financial Research* 12, 183-192.

Muscarella, Chris J., and Michael R. Vetsuypens, 1990, Efficiency and organizational structure: A study of reverse LBOs, *Journal of Finance* 45, 1389-1413.

Odean, Terrance, 1998, Are investors reluctant to realize their losses?, *Journal of Finance* 53, 1775-1798.

Phalippou, Ludovic, 2009, Beware of venturing into private equity, *Journal of Economic Perspectives* 23, 147-166.

Ritter, Jay R., 2015, Growth capital-backed IPOs, *Financial Review* 50, 481-515.

Ritter, Jay R., 2020, Initial Public Offerings: VC-backed IPO Statistics Through 2019, available at https://site.warrington.ufl.edu/ritter/

Robinson, David T., and Berk A. Sensoy, 2016, Cyclicality, performance measurement, and cash flow liquidity in private equity, *Journal of Financial Economics* 122, 521-543.

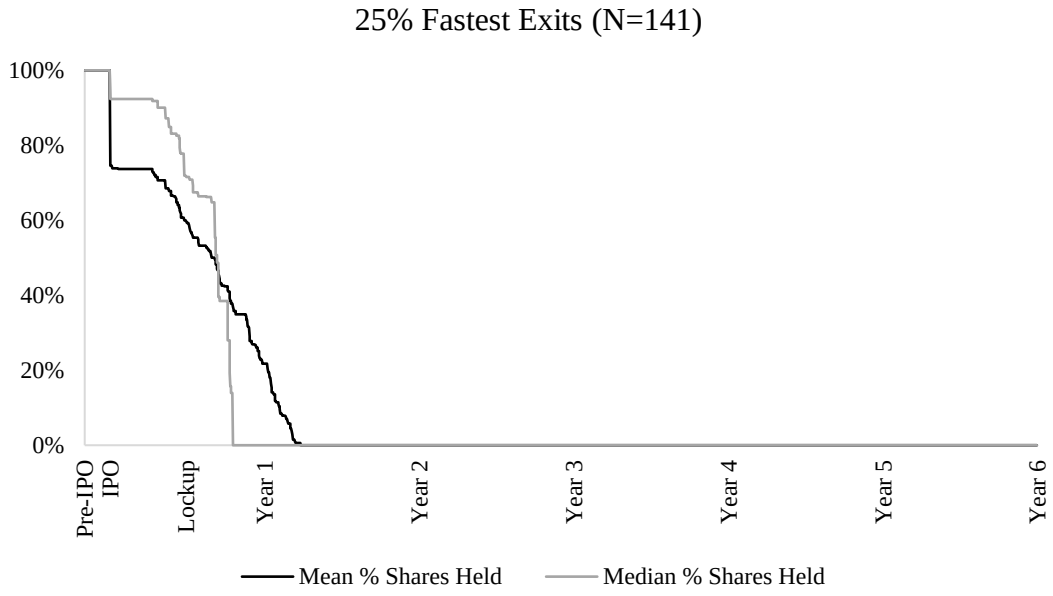
Shefrin, Hersh, and Meir Statman, 1985, The disposition to sell winners too early and ride losers too long: Theory and evidence, *Journal of Finance* 40, 777–790.

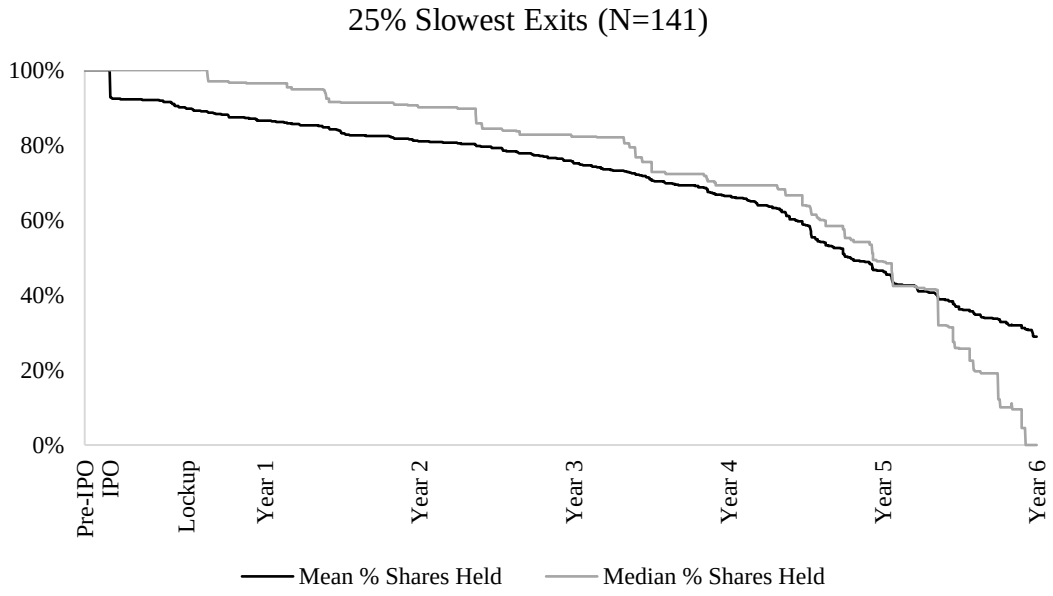
Statman, Meir, Steven Thorley, and Keith Vorkink, 2006, Investor overconfidence and trading volume, *Review of Financial Studies* 19, 1531-1565.

Tversky, Amos, and Daniel Kahneman, 1974, Judgment under uncertainty: Heuristics and biases, *Science*, New Series, Vol. 185, No. 4157, 1124–1131.

Figure 1. Exit Processes

The displayed graphs show exit processes for the 25% fastest and slowest exited deals in the sample of all fully exited deals (N=564), as well as the interquartile range of exits for comparison. 'Fast' and 'slow' is measured as the time from IPO to last share sale. The graphs display over time the mean and median %-ownership of shares the GPs hold in their respective portfolio companies in relation to the total number of shares they held at the IPO (i.e. not the GPs' total %-ownership of the portfolio company as a whole). The total number of shares held by a GP pre-IPO is defined as 100%.





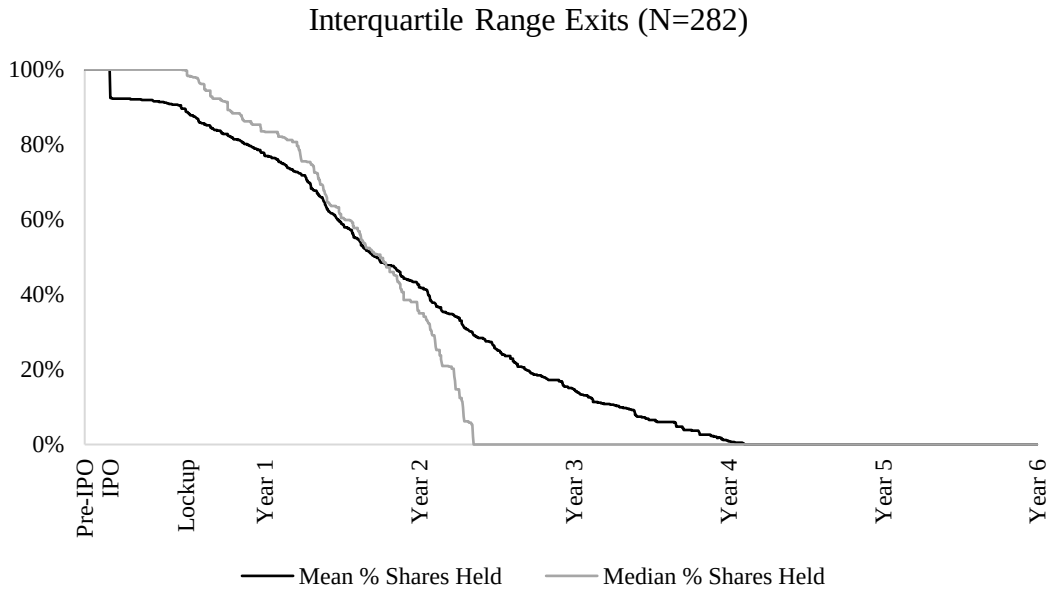

Interquartile Range Exits (N=282)
100%
80%
60%
40%
20%
0%
Pre-IPO
IPO
Lockup
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Mean % Shares Held
Median % Shares Held

Figure 2. Carried Interest Provisions

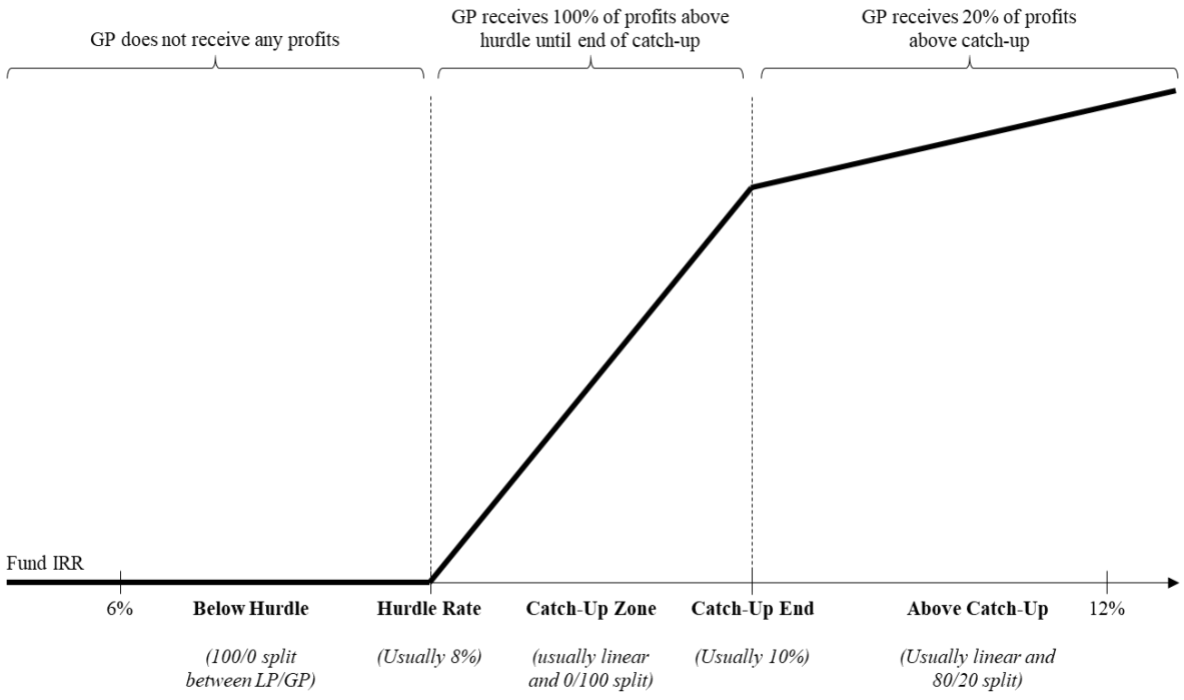


Table 1. Sample Description

This table provides an overview of our sample, especially numbers and levels of observations. The full sample contains 359 companies bought out in LBO transactions and subsequently taken public by their Private Equity owners through IPOs. Our main unit of observation are GP-Portfolio Company pairs. On average, each LBO has 1.7 participating GPs, and we obtain 605 pairs of GPs and portfolio companies ('deals'). One LBO with three participating GPs would therefore count as three observations/deals. The 252 GPs invested in the 359 portfolio companies hold an average of 46.9% of outstanding shares each. Jointly, all invested GPs own 79.4% of the shares in each portfolio company. We create subsamples by splitting the full sample according to the post-IPO exit process. In 407 deals, the GPs exit their investments through 'regular' share sales into public equity markets. GPs in 129 deals sell all or parts of their shareholdings through post-IPO M&A transactions, and 28 deals file for Chapter 11 before their exit is completed. 41 deals are still active as of January 2018. Across all 605 deals, we record 2,900 separate share sale and -distribution transactions, fully tracking each GPs' exit from the IPO to the last share sale. Also, we track all board members who are employees of the portfolio companies' GP owners from the moment they join the board until they leave the board at or after the IPO. There are a total 1,219 GP board members across 508 deals. 97 deals do not have a director who is employed by its GP owner. 117 GP Directors are still active on the Boards of their portfolio companies as of January 2018.

Numbers, unless otherwise noted	**All Fully Exited Deals**	**'Regular' Exit Sub-Sample**	**M&A Exit Sub-Sample**	**Chapter 11 Sub-Sample**	**Active Deals** (as of Jan. 2018, not in sample)
Units of Observation					
Portfolio Companies[(1)]	330	246	94	22	29
GP-Portfolio Company Pairs	564	407	129	28	41
GPs					
Total Number of GPs in Sample	238	203	80	27	34
Number of GPs per Deal (Avg.)	1.6	1.7	1.5	1.4	1.5
GP Ownership (Avg.)	46.3%	42.4%	54.7%	63.4%	55.6%
All GPs Ownership per Deal (Avg.)	79.2%	78.3%	81.4%	83.3%	81.6%
Share Sale Transactions					
At IPO Share Sales	276	212	52	12	13
Post-IPO Share Sale Transactions	1,686	1,430	199	57	124
Post-IPO Share Distributions	200	172	13	15	37
Exit at IPO	17	17	0	0	0
Exit Sales/Distributions	547	390	129	28	0
Total	*2,726*	*2,221*	*393*	*112*	*174*
Board Seat/Exit Sample					
GP-Portfolio Company Pairs with…					
…at least one GP Director	467	319	121	27	41
…no GP Director	97	88	8	1	0
Total Number of GP Directors	1,116	740	307	69	103
GP Directors Still Active (Jan. 2018)	53	50	0	3[(2)]	64

[(1)] The number of portfolio companies per exit category does not sum up to 359 because the same portfolio company could be subject to multiple GP exit types.
[(2)] 3 directors stayed on the Boards of portfolio companies as they underwent restructuring processes that are not fully resolved as of Jan. 2018.

Table 2. Descriptive Statistics: GP Exit Process

This table provides summary statistics on GPs' exit processes in their portfolio companies at and following IPOs. The top part of the table shows the lengths between LBO, IPO and Exit. The Duration is calculated as the sum of the time-weighted deal cash flows (from share sales), much like the Macaulay Duration of a bond. The post-IPO duration is calculated identically but starts with the IPO instead of the LBO. The middle part of the table displays the average share sale size across different sales transactions, measured as % of the original number of shares owned at IPO. We separately report the numbers across all transactions, for IPO sales only, for post-IPO sales only, for share distributions only, and for the final exit sales only. Note that we report the final Exit Sale separately (1) for all deals, and (2) for deals which do not sell 100% of their shares in one singular transaction ('Exit with Prior Sales'). The bottom part of the table displays indicators of Exit Timing. We report the lengths from the IPO to a deal's first and single largest (in terms of %-sold) share sale transactions. Additionally, we report the average number of days between share sales. This is calculated not from the IPO but once the exit process starts, i.e. with the first share sale. The length of the period between a deal's first share and exit is reported in the last row of the Exit Timing section, expressed as percent of the length between IPO and Exit. A deal that has its first share sale 800 days after the IPO and is exited in a second share sale 1,000 days after the IPO would therefore have a 20% sale period length and an average of 200 days between sales. The last section of the table displays number and percentages of deals which exhibit a certain exit feature such as share sales or a full exit at IPO or uses a combination of sales and distributions in its exit process. We define deals as having 'coordinated' exit processes if two or more GPs in the same portfolio company sell shares on the same dates on more than one occasion.

	'Regular' Exit Sample			**M&A Exit Sample**			**Chapter 11 Sample**		
	Obs	Mean	Median	Obs	Mean	Median	Obs	Mean	Median
Deal Length (In Years)									
Total Deal Length	407	6.2	6.1	129	6.4	5.9	28	7.4	6.9
LBO to IPO	407	3.5	2.9	129	3.2	2.7	28	2.6	2.0
IPO to Exit	407	2.7	2.1	129	3.2	2.7	28	4.8	4.0
Total Deal Duration	407	5.0	4.9	129	5.3	4.5	28	3.0	2.1
Post-IPO Duration	407	1.9	1.4	129	2.5	2.3	28	1.4	1.3
Lockup Period *(in Days)*	407	180	180	125	178	180	28	178	180
Share Sale Details									
Number of Sales per Deal	407	5.5	4.0	129	3.1	2.0	28	4.0	2.0
%-Ownership Sold…									
…per Transaction	2,221	18.3	11.0	393	32.8	17.5	112	25.0	3.0
…in IPO Sales only	212	18.9	14.9	52	20.2	14.4	12	11.4	13.8
…in Post-IPO Sales only	1,430	11.6	6.1	199	8.0	0.5	57	4.2	0.2
…in Distributions only	172	9.9	9.2	13	19.6	16.0	15	4.0	0.6
…in Exit Sales only	390	42.8	33.7	129	77.5	86.7	28	84.4	95.0
…in Exits with Prior Sales	339	34.2	26.3	80	63.7	64.9	18	75.7	84.9
Exit Timing									
Time (in years) from IPO to…									
…First Share Sale (excl. IPO)	390	1.4	0.9	129	2.3	1.7	28	3.2	2.7
…Largest Sale (incl. Exit)	407	2.0	1.3	129	3.1	2.6	28	4.6	4.1
Days between Share Sales	338	259.0	164.5	80	681.6	493.3	18	784.2	650.3
Sale Period as % of Deal Length	407	44.3	47.4	129	22.7	0	28	23.6	0
Exit Patterns									
Deals with									
…Sales at IPO	197 of 407 (48.4%)			50 of 129 (38.8%)			11 of 28 (39.3%)		
…Exits at IPO	17 of 407 (4.2%)			0 of 129 (0%)			0 of 28 (0%)		
…Sales in Lockup Period	53 of 407 (13.0%)			9 of 129 (7.0%)			1 of 28 (3.6%)		
…'Coordinated' Sales	33 of 139 (23.7%)			3 of 44 (6.8%)			0 of 7 (0%)		
…Sales and Distributions	63 of 407 (15.5%)			4 of 129 (3.1%)			2 of 28 (7.1%)		

Table 3. Descriptive Statistics: GP Board Seats and Board Exit Behavior

This table shows summary statistics of portfolio companies' board members who are employed by their GP owners. The upper part of the table shows total board sizes per portfolio company and the number of board seats held by the invested GPs. The middle part of the table displays summary statistics of the time GP employees spend on the boards of their portfolio companies. We report the average time spent on boards from LBO/IPO to each GP-director's exit and the time from IPO to the first board exit and the last board exit on deal-level. The bottom part of the table contains information on board exits around various events in the lifecycle of an LBO. We report the number of GP-Directors resigning from boards at or before their portfolio companies' IPOs, the number of GP-Directors resigning from boards at or around their GP employers' last share sale, and those Directors who remain on boards after the share exit of their GP employers.

	'Regular' Exit Sample			**M&A Exit Sample**			**Chapter 11 Sample**		
	Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median
Board Size Portfolio Company	246	7.7	7.0	94	7.6	7.0	22	6.9	7.0
Board Seats Held by Single GP per Deal at LBO	319	2.3	2.0	121	2.5	2.0	27	2.6	2.0
Board Seats Held by all GPs per Deal at LBO	407	3.7	3.0	129	3.8	4.0	28	3.4	3.0
Time Spent on Board (In Years)									
Time on Board (Per Director) from LBO to Exit	690	5.8	5.7	307	6.2	5.7	66	6.5	6.2
Time on Board (Per Director) from IPO to Exit	690	2.4	1.9	307	2.9	2.5	66	3.8	3.4
Time on Board (Per Director) Post-Exit for Active Deals[1]	50	5.9	4.9	0	-	-	3	1.8	0.8
Time IPO to First Board Exit	319	1.8	1.4	121	2.4	2.1	27	3.1	2.8
Time IPO to Last Board Exit	319	2.9	2.4	121	3.2	2.7	27	4.3	3.7
Board Exit Timing									
Board Exits at or pre IPO[2]	23 of 740 (3.1%)			6 of 307 (2.0%)			0 of 69 (0%)		
Board Exits at GP (Share) Exit[3]	136 of 740 (18.4%)			257 of 307 (83.7%)			41 of 69 (59.4%)		
Board Exits after Last Share Sale[4]	311 of 740 (42.0%)[5]			5 of 307 (1.6%)			11 of 69 (15.9%)		

[1)] As of January 2018
[2)] Exits from LBO to 45 days post IPO
[3)] (in 3 months around Exit, so 45 days pre to 45 days post)
[4)] Exit>45 days post last sale, including active directors of fully exited deals (as of Jan 2018)
[5)] Median length until final board exit: 1.2 years after last sale

Table 4. Absolute and Relative Stock Performance post-IPO

This table shows summary statistics of absolute and relative stock price performances of our in-sample LBOs following their IPOs. We report the performance for the lockup period as well as the 12, 24 and 36 months following the IPO. The unit of observation is a single portfolio company (N=330). The last two columns report the stock price performance from IPO to final exit of the GP. The unit of observation is, as in all previous analyses, a GP-portfolio company pair (N=564). All stock performances are relative to the portfolio company's stock price at the end of the first post-IPO trading day. Excess returns are measured over the S&P 500 and Russell 2000 stock indexes. Jensen's Alpha is the intercept of firm-specific time-series regressions of monthly firm excess returns and the Russell 2000 stock index excess returns. Fama-French 3 Factor Alphas are intercepts estimated using Fama and French three factor regression models. Firms that delist after their IPO drop out of the sample at the time of delisting. Numbers in brackets are p-values indicating statistical significance of differences of means (t-tests) and medians (Wilcoxon) from zero. All reported numbers in both Panels are in %.

	Lockup		**12 Months**		**24 Months**		**36 Months**		**Exit (N=564)**	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Avg. Monthly Raw Return	1.69	0.94	1.28	0.76	0.83	0.66	0.78	0.59	0.88	0.43
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Buy-and-Hold Raw Return	8.15	8.11	14.85	12.78	16.40	6.09	20.63	0.87	30.43	19.34
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.23]	[0.00]	[0.81]	[0.00]	[0.00]
Avg. Monthly Excess Return										
w/ S&P	1.33	0.78	0.87	0.27	0.51	0.19	0.53	0.15	0.52	0.11
	[0.00]	[0.00]	[0.00]	[0.17]	[0.00]	[0.18]	[0.00]	[0.20]	[0.00]	[0.17]
w/ Russell 2000	1.22	0.66	0.69	0.26	0.32	0.07	0.32	0.01	0.27	-0.09
	[0.00]	[0.02]	[0.00]	[0.20]	[0.06]	[0.61]	[0.03]	[0.95]	[0.06]	[0.24]
Buy-and-Hold Excess Return										
w/ S&P	5.78	4.55	9.74	5.94	8.01	-5.35	11.12	-5.91	17.09	10.79
	[0.00]	[0.04]	[0.00]	[0.07]	[0.05]	[0.32]	[0.03]	[0.34]	[0.00]	[0.00]
w/ Russell 2000	5.39	4.28	8.43	4.98	6.35	-4.13	6.77	-10.45	10.09	6.84
	[0.00]	[0.05]	[0.00]	[0.13]	[0.12]	[0.41]	[0.18]	[0.11]	[0.00]	[0.02]
Alphas										
Jensen's Alpha w/ S&P	1.21	1.20	0.75	0.68	0.49	0.65	0.31	0.21	0.43	0.51
	[0.00]	[0.00]	[0.00]	[0.00]	[0.03]	[0.00]	[0.09]	[0.18]	[0.00]	[0.00]
Jensen's Alpha w/ Russell 2000	1.80	1.25	0.86	0.89	0.35	0.54	0.19	0.06	0.35	0.27
	[0.00]	[0.00]	[0.00]	[0.00]	[0.05]	[0.01]	[0.25]	[0.80]	[0.06]	[0.16]
Fama-French 3 Factor Alpha	1.64	1.48	0.70	0.98	0.37	0.45	0.27	-0.07	0.37	0.05
	[0.00]	[0.00]	[0.04]	[0.00]	[0.10]	[0.00]	[0.15]	[0.45]	[0.18]	[0.80]

Table 5. Absolute and Relative Post-IPO Performance

Panel A shows summary statistics of absolute and relative deal-level performance benchmarks: Total Value to Paid-in Multiple ('TVPI'), Internal Rate of Return ('IRR'), as well as the Public Market Equivalent according to Kaplan and Schoar (2005, 'KS-PME') and the 'Timing Track Record' measure by Gredil (2022), using the S&P 500 and Russell 2000 stock indexes as benchmark. All numbers are reported gross, i.e. pre-fees, and relative to the stock price at the end of the first day of trading. We calculate all performance numbers based on deal-level cash flows from each portfolio company's IPO until the GPs' final exit, which takes account of the timing chosen by the GP for the share sales. The starting point for the analysis is the end of the first trading day, as any IPO first-day return is a cost to the LP, rather than a benefit. We count the US-$ volume of all dividends, share distributions and share sales as cash flows to the GP-investor, i.e. positive cash flows. The US-$ volume of all share acquisitions at or after the IPO is counted as cash flows from the GP-investor, i.e. negative cash flows. The implied GP investment volume is calculated by multiplying the number of shares held by each GP immediately before the IPO with the respective portfolio company's share price at the end of the first trading day. Numbers in brackets are p-values indicating the statistical significance of differences in means (t-tests) and medians (Wilcoxon) from 1 for TVPIs, KS-PMEs and Gredil-TTRs, and 0 for IRRs, with standard errors clustered by IPO year. For the Timing Track Record, we report three different specifications. First, we define the time period as the maximum of 3.5 Years post-IPO or the actual deal length post-IPO ('Max(3.5 Yrs./Deal Life)'). Second, we define the time period as the maximum of the remaining fund lifetime at the time of the IPO or the actual deal length post-IPO ('Max(Fund Life/Deal Life)'). For each version, we use the S&P 500 and the Russell 2000 as benchmark indexes. Third, we report the TTR against each respective stock's own returns ('TTR w/Stocks' Own Returns'). In Panel B, we show indicators of the relationship between the 'GP Ownership Sold at IPO (in %)', the IPO 'first-day return (in %)' and our two main performance indicators TVPI and PME. We report rank correlations and covariances divided by variances for all indicators across the full sample of N=564 GP portfolio company investments, as well as the Standard Deviations ('SD') of each individual variable. Numbers in brackets are p-values. Standard errors are clustered by IPO year.

Panel A	**All Deals**		**'Regular' Exit**		**M&A Exit**		**Chapter 11**	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
TVPI	1.13	1.06	1.17	1.08	1.20	1.06	0.16	0.04
	[0.00]	[0.17]	[0.00]	[0.05]	[0.03]	[0.53]	[0.00]	[0.00]
IRR *(in %)*	6.32	5.70	11.84	7.65	7.38	4.50	-78.51	-88.30
	[0.00]	[0.00]	[0.00]	[0.00]	[0.03]	[0.00]	[0.00]	[0.00]
KS-PME w/ S&P 500	1.04	0.99	1.10	1.01	1.05	1.03	0.16	0.03
	[0.09]	[0.66]	[0.00]	[0.83]	[0.46]	[0.74]	[0.00]	[0.00]
KS-PME w/ Russell 2000	1.00	0.96	1.04	0.99	1.03	0.96	0.15	0.04
	[0.86]	[0.13]	[0.14]	[0.64]	[0.65]	[0.65]	[0.00]	[0.00]
Gredil-Timing Track Record (TTR)								
Max(3.5 Yrs./Deal Life) w/S&P 500	1.02	0.98	1.02	0.97	1.02	1.00	1.04	1.00
	[0.70]	[0.50]	[0.76]	[0.27]	[0.67]	[1.00]	[0.22]	[0.96]
Max(3.5 Yrs./Deal Life) w/Russell 2000	1.01	0.98	1.01	0.96	1.01	1.00	1.02	1.00
	[0.82]	[0.53]	[0.84]	[0.21]	[0.80]	[0.99]	[0.36]	[1.00]
Max(Fund Life/Deal Life) w/S&P 500	0.99	1.00	0.99	0.98	0.98	1.00	1.06	1.01
	[0.69]	[0.71]	[0.67]	[0.24]	[0.45]	[1.00]	[0.20]	[0.79]
Max(Fund Life /Deal Life) w/Russell 2000	0.96	0.98	0.97	0.97	0.94	1.00	1.00	1.00
	[0.12]	[0.18]	[0.15]	[0.09]	[0.13]	[1.00]	[0.93]	[0.93]
TTR w/Stocks' Own Returns	1.06	1.00	1.07	1.00	1.02	1.00	1.17	1.00
	[0.00]	[0.99]	[0.00]	[0.97]	[0.01]	[1.00]	[0.32]	[0.99]

Panel B	**1st day return (%)**	**TVPI**	**KS-PME w/ S&P 500**	**KS-PME w/ Russell 2000**
	SD = 0.2257	SD = 0.5836	SD = 0.5431	SD = 0.4961
GP Ownership Fraction Sold at IPO (%) SD=0.2149				
(Rank-) Correlation	0.1076	-0.1547	-0.0935	-0.0651
	[0.21]	[0.01]	[0.06]	[0.18]
Covariance/Variance	-0.0119	-0.3566	-0.2204	-0.1379
	[0.81]	[0.00]	[0.00]	[0.05]

Table 6: LBO Deal Performance and Fees

This table shows performance indicators calculated for the whole LBO, from the initial GP equity investment at LBO until the last share sale post-IPO. We report both cash multiples and Internal Rates of Return (IRRs), using the full time series of deal-level cash flows as the basis for our calculations, including all actual deal cash in- and outflows: the GP initial LBO equity investment, all pre-IPO dividends, deal-level fees (LBO fee, monitoring fees, 'recap' and M&A fees, and termination fees, assuming 50% deal fee rebates), distributions and follow-on investments, as well as all at-IPO and post-IPO cash flows from share sales, share acquisitions, pro-rata dividend payments and share distributions. In addition to the gross (i.e. pre-fees) numbers, we also report the numbers net of management fees, carried interest, and the sum of both as the total deal-fees paid. We calculate management fees by applying contractual annual management fees to the invested capital by the GP in each company. To account for industry-typical 'cost-basis' calculations of management fees, we adjust the invested capital downward by the percentage of shares sold post-IPO to lower the effective management fee payments. To determine deal-level carried interest payments, we calculate rolling deal IRRs using the aforementioned time series of deal cash in- and outflows. Once the deal-IRR surpasses the fund hurdle rate, we deduct the (fund) carried interest off each distribution. We obtain all fund-specific fee data from Preqin's 'Terms & Conditions' database and match it to the GP's lead investment fund in each GP-portfolio company pair. Modes for management fee, hurdle rate and carried interest are 1.5%, 8% and 20%, respectively. Below the performance numbers, we report the full fee volumes per deal (in $mn.), as well as the deal fees as percentage of the total deal distributions (in $mn.) on a total and annualized basis. In column (1), we report these numbers for all 564 deals in our sample. In column (2), we report the numbers for the 25% of deals (N=141) with the fastest post-IPO exits, and in column (3) for the 25% of deals (N=141) with the slowest post-IPO exits. The post-IPO exit length is measured as the time between the IPO and the last share sale. In column (4) we report the numbers for a subsample of deals which had at least one GP director on the board post-IPO (N=478). This subsample is used for the hypothetical trading pattern shown in column (5). In this column (5), we replace the actual post-IPO share sales with a hypothetical post-IPO trading pattern. For each deal, we determine the date of the very last post-IPO GP director board exit, and equally spread all share sales across each month between this exit date and the end of the IPO lockup period. In columns (1), (2), (3) and (4) the numbers in brackets are p-values indicating the statistical significance of the differences in means (t-test) and medians (Wilcoxon) from 1. In column (5), the p-values indicate the statistical significance of the differences in means (t-tests) and medians (Wilcoxon) of the performance metrics between the column (4) and (5) numbers. Reported IRRs are winsorized at the 98% level.

	(1)		(2)		(3)		(4)		(5)	
	Actual Share Sales (N=564)		**25% Fastest Exits (N=141)**		**25% Slowest Exits (N=141)**		**Subsample w/post-IPO GP Directors (N=478)**		**Equal sales until Full Board Exit (N=478)**	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Gross Full Deal Performance (Pre-Fees)										
Gross Cash Multiple	4.15	3.17	4.71	3.63	3.56	2.68	4.18	3.13	4.45	3.23
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]	[0.10]
Gross IRR	48.6%	31.9%	71.5%	45.7%	32.1%	21.2%	52.3%	34.4%	53.8%	33.6%
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.87]	[0.20]
Net Full Deal Performance (Net of Fees)										
Net Cash Multiple	3.25	2.51	3.72	2.96	2.76	2.15	3.28	2.50	3.47	2.55
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.02]	[0.15]
Net IRR	44.5%	28.3%	62.3%	36.1%	31.4%	20%	48.1%	30.2%	44.1%	28.6%
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.92]	[0.86]
Fee Volume per Deal ($mn.)										
Management Fees	19.65	6.62	5.39	1.60	32.97	15.82	18.19	5.80	16.33	5.44
									[0.00]	[0.10]
- of which Management Fees post IPO	*8.04*	*2.20*	*0.60*	*0.16*	*19.56*	*9.17*	*7.79*	*2.11*	*5.93*	*2.20*
Carried Interest	72.57	28.70	33.72	11.43	87.80	38.29	63.46	25.40	65.95	22.04
									[0.32]	[0.52]
Total Fees	92.21	41.28	39.11	14.66	120.77	62.87	81.65	37.11	82.28	34.61
									[0.78]	[0.01]
Fees as % of Total Distributions										
Management Fees	5.1%	2.4%	3.1%	1.6%	8.1%	4.0%	5.1%	2.4%	4.8%	2.4%
Carried Interest	11.1%	12.8%	12.3%	14.0%	9.3%	11.6%	11.1%	12.9%	10.8%	12.4%
Total Fees	16.2%	16.4%	15.4%	16.3%	17.4%	16.9%	16.2%	16.3%	15.6%	15.8%
Fees as % of Total Distributions p.a.										
Management Fees	0.8%	0.5%	0.7%	0.5%	0.9%	0.5%	0.8%	0.5%	0.7%	0.4%
Carried Interest	2.5%	2.1%	3.9%	3.9%	1.2%	1.3%	2.6%	2.2%	1.9%	1.7%
Total Fees	3.3%	2.7%	4.6%	4.4%	2.1%	1.8%	3.4%	2.8%	2.6%	2.1%

Table 7. Tobit Regression Models: Explaining Share Sale Volumes

This table shows results of multivariate tobit regression models. The unit of observation is each month from IPO to exit in each GP-portfolio company pair. The dependent variable in all models is the $mn.-volume of shares sold by GPs in their portfolio companies (calculated as number of shares sold*sale price per share) in each month post-IPO. The model is left-censored, with a minimum value of 0. The IPO month and all IPO share sales are excluded, all 17 deals that fully exit at the IPO are therefore excluded. Standard errors are clustered on the GP fund-level. Reported are marginal effects, values in brackets are t-values, and asterisks indicate statistical significance at 1% (***), 5% (**) and 10% (*) levels. Descriptions and summary statistics of all variables are given in Appendix 1 and 2, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fund Variables							
Difference IRR-Hurdle Rate (%)			-13.85**			-10.99	-11.05*
			[-1.97]			[-1.58]	[-1.92]
Fund IRR (%)				-14.63**			
				[-2.06]			
Fund in Carry (Yes=1, No=0)					1.18		
					[0.59]		
GP Variables							
GP Fundraising Period (Yes=1, No=0)			-0.07	-0.14	0.05	-0.39	-0.42
			[-0.04]	[-0.09]	[0.03]	[-0.27]	[-0.25]
Stock Performance Variables							
Stock Price > IPO Price (Yes = 1, No=0)	19.35***	6.64***	20.16***	20.14***	20.18***	9.59***	9.80***
	[7.19]	[6.05]	[6.99]	[6.99]	[7.05]	[3.82]	[4.15]
Absolute Monthly Stock Return (%, 1-Month Lagged)	4.85	1.69	6.00	5.99	5.35	4.40	4.05
	[0.94]	[0.72]	[1.09]	[1.09]	[0.94]	[0.70]	[0.58]
Stock Trading Volume							
Monthly Trading Volume	7.06***	6.82***	7.30***	7.30***	7.16***	4.03***	4.51***
	[4.04]	[6.76]	[4.20]	[4.23]	[3.91]	[3.58]	[3.99]
Deal Financial Variables							
EBIT Margin (%)	13.36**	4.77	15.73**	15.78**	15.80**	15.57**	16.10**
	[2.15]	[0.90]	[2.25]	[2.26]	[2.29]	[2.13]	[2.28]
Dividend Payments ($mn.)	-3.91	-3.06	-4.66	-4.93	-4.67	10.44	10.00
	[-0.29]	[-0.56]	[-0.32]	[-0.34]	[-0.32]	[0.99]	[0.87]
Board Variable							
Board Exit (Yes=1, No=0)	36.81***	17.97***	39.86***	39.86***	39.83***	27.63***	28.32***
	[9.38]	[7.31]	[9.34]	[9.34]	[9.44]	[5.65]	[5.80]
Market Variable							
Russell 2000 EV/EBITDA Multiple	0.78	0.37	0.91	0.94	1.02	0.76	0.68
	[0.96]	[1.00]	[1.08]	[1.10]	[1.21]	[0.98]	[0.98]
Monthly U.S. LBO Volume (ln $bn.)	-0.48	0.69	-0.10	-0.08	-0.54	0.54	0.48
	[-0.54]	[1.44]	[-0.10]	[-0.09]	[-0.55]	[0.61]	[0.52]
Club Deal Variable							
Share Sale by Co-Investor in Month (Yes=1, No=0)						26.89***	27.15***
						[9.67]	[10.67]
GP Fixed Effects	No	Yes	No	No	No	No	Yes
Portfolio Company Fixed Effects	No	Yes	No	No	No	No	Yes
Total Number of Observations	20,234	20,234	6,390	6,390	6,390	4,081	4,081
Months with Share Sales	1,567	1,567	638	638	638	407	407
Prob > Chi2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pseudo R-Squared	0.05	0.09	0.05	0.05	0.05	0.08	0.14

Appendix 1: Description of Tobit Regression Variables

This table contains descriptions of all dependent and independent variables used across multivariate tobit regression models in this paper (and probit regressions in Online Appendix 11), along with their source. 'Original calculation' means the variable was calculated by the authors, and not taken directly from a database source.

Variables	Source	Description
Dependent Variables		
GP Share Sale Transaction in Given Month (Yes=1, No=0)	SEC	Dummy variable taking the value of 1 for all post-IPO months in which a GP sells at least one share in a respective portfolio company, and 0 for all months without share sales. This raw data on post-IPO share sales is hand-collected using SEC Form 4 and SC-13 filings. Original calculation based on SEC filings.
Volume of GP Share Sale Transaction in Given Month ($mn.)	SEC	Volume (in $mn.) of all GP share sale transactions in each month post-IPO in a portfolio company. The variable takes the value of $0 in each month with no share sale transactions. The data is based on SEC Form 4 filings, indicating both number of shares sold and sales price for each share sale transaction. Original calculation based on SEC filings.
Fund Variables		
Difference IRR-Hurdle Rate (%)	Preqin	Difference between IRR and Hurdle Rate of the (lead) investment PE fund in each GP-portfolio company pair, measured during each month of the post-IPO period of the portfolio company. Original calculation based on Preqin fund performance (IRR) and T&C (Hurdle Rate) data. Preqin releases 'T&C' data anonymized (i.e. without the PE fund names). We therefore match the data by fund size and vintage year to our sample deals. Fund performance data can be matched 1:1 as all fund-level information (including names) is available.
Fund IRR (%)	Preqin	IRR of the (lead) investment PE fund in each GP-portfolio company pair, measured during each month of the post-IPO period of the portfolio company. Taken from Preqin fund performance data.
Fund in Carry (Yes=1, No=0)	Preqin	Dummy variable taking the value of 1 if the IRR of the (lead) investment PE fund in each GP-portfolio company pair is higher than its Hurdle Rate, and 0 otherwise. Measured during each month of the post-IPO period of the portfolio company. Original calculation based on Preqin fund performance (IRR) and Terms & Conditions ('T&C', for Hurdle Rate) data. Matching of fund performance and T&C data as described above.
GP Variables		
GP Fundraising Period (Yes=1, No=0)	Preqin	Dummy variable taking the value of 1 if the GP in each GP-portfolio company pair is raising a follow-up fund, and 0 otherwise, measured in each month during its portfolio company's post-IPO period. We determine whether a GP is raising a fund if it has a fund with a vintage year within the first two years after the portfolio company's IPO. Original calculation based on Preqin fund performance data.
Stock Performance Variables		
Stock Price > IPO Price (Yes = 1, No=0)	CRSP	Dummy variable taking the value of 1 if a portfolio company's stock price is higher than the company's IPO price in any given month post-IPO, and zero otherwise. Original calculation based on CRSP data.
Absolute Monthly Stock Return (%, 1-Month Lagged)	CRSP	Absolute monthly stock return of each portfolio company during its post-IPO period, lagged by one month. Original calculation based on CRSP data.
Stock Trading Volume		
Monthly Trading Volume	CRSP	Daily share trading volume, averaged on a monthly basis.
Deal Financial Variables		
EBIT Margin (%)	SEC	Portfolio company EBIT Margin in IPO (fiscal) year taken from S-1/424B and 10-K data.
Dividend Payments ($mn.)	CRSP, SEC	Pro-rata post-IPO common stock dividends received by GP until final share sale. Calculated using the number of common shares held by GPs between IPO and last share sale, and per-share dividend as paid out by their portfolio companies.
Board Variable		
Board Exit (Yes=1, No=0)	SEC	Dummy variable taking the value of 1 if there is at least one GP director board exit in a month during the portfolio company's post-IPO period, and 0 otherwise. Original calculation based on SEC 8-K and 10-K/424B filings.
Market Variable		
Russell 2000 EV/EBITDA Multiple	Capital IQ	EV/EBITDA Multiple of Russell 2000 companies, averaged on a monthly basis.
Monthly U.S. LBO Volume (ln $bn.)	Capital IQ	Aggregate monthly US-$ volume of all US (=target based in US) LBOs. Original calculation using Capital IQ LBO deal data.
Club Deal Variable		
Share Sale by Co-Investor in Month (Yes=1, No=0)	SEC	Dummy variable measured only for club deals, i.e. portfolio companies with at least two GP investors. It takes the value of 1 if both GPs sell shares in the same month during the portfolio company's post-IPO period. Original calculation using our share sale data.

Appendix 2. Summary Statistics of Tobit Regression Variables

This table contains summary statistics for all dependent and independent variables used across the tobit multivariate regression models in this paper and probit regressions in Online Appendix 11.

Variables	Obs.	Mean	Median	SD	25%	75%
GP Share Sale Transaction in Given Month (Yes=1,633; No=18,601)	20,234	0.08	0.00	0.27	0.00	1.00
Volume of GP Share Sale Transaction in Given Month ($mn.)	20,234	13.13	0.00	81.97	0.00	1,833.4
Difference IRR-Hurdle Rate (%)	7,262	0.09	0.06	0.15	-0.26	0.89
Fund IRR (%)	7,262	0.17	0.14	0.14	-0.18	0.97
Fund in Carry (Yes=5,825; No=1,437)	7,262	0.80	1.00	0.40	0.00	1.00
GP Fundraising Period (Yes=2,830; No=4,432)	7,262	0.39	0.00	0.49	0.00	1.00
Stock Price>IPO Price (Yes=10,574; No=9,660)	20,234	0.52	1.00	0.50	0.00	1.00
Absolute Monthly Stock Return (%, 1-Month Lagged)	20,234	0.01	0.01	0.15	-0.71	1.93
Monthly Trading Volume (mn.)	20,234	0.65	0.26	1.22	0.11	0.65
EBIT Margin (%)	20,234	0.09	0.09	0.15	-0.32	0.41
Dividend Payments ($mn.)	20,234	0.01	0.00	0.06	0.00	0.80
Board Exit (Yes=450; No=19,784)	20,234	0.02	0.00	0.15	0.00	1.00
Russell 2000 EV/EBITDA Multiple	20,234	9.92	10.16	1.33	8.96	10.99
U.S. LBO Volume per Month (ln $bn.)	20,234	10.10	10.02	0.89	7.89	12.41
Share Sale by Co-Investor in Month (Yes=748, No=12,120)	12,868	0.06	0.00	0.23	0.00	1.00