Private equity capital deployment and deal selection under cash pressure *

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ABSTRACT

Market conditions influence the capital deployment of private equity funds and may contribute to an accumulation of cash, or "dry powder", toward the end of a fund's investment period. This study investigates whether this buildup of dry powder impacts the investment decisions of 431 US private equity funds between 1986 and 2019. Our analysis reveals two types of reactions for funds that accumulate an abnormal level of dry powder at the end of their investment phase: some funds remain underinvested, while others accelerate capital deployment during the remaining authorized period. Funds in the latter category tend to select deals with lower leverage and higher entry multiples than the former type of funds. These deals underperform the other kinds of deal, all else being equal. These investment patterns are not associated with the characteristics of fund sponsors or the prevailing market conditions, but instead show a correlation with fund fee structures. One possible channel explaining GP overinvestment could be their motivation to avoid opportunity costs in fees should they stay underinvested.

Keywords: Leveraged buyout, dry powder, management fees, leverage, investment distortions, performance

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Market conditions influence the capital deployment of private equity funds and may contribute to an accumulation of cash, or "dry powder", toward the end of a fund's investment period. This study investigates whether this buildup of dry powder impacts the investment decisions of 431 US private equity funds between 1986 and 2019. Our analysis reveals two types of reactions for funds that accumulate an abnormal level of dry powder at the end of their investment phase: some funds remain underinvested, while others accelerate capital deployment during the remaining authorized period. Funds in the latter category tend to select deals with lower leverage and higher entry multiples than the former type of funds. These deals underperform the other kinds of deal, all else being equal. These investment patterns are not associated with the characteristics of fund sponsors or the prevailing market conditions, but instead show a correlation with fund fee structures. One possible channel explaining GP overinvestment could be their motivation to avoid opportunity costs in fees should they stay underinvested.

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I. Introduction

Assets under management in private equity (PE) funds grew more than threefold during the last decade to reach $9.4 trillion (globally) by the end of March 2024. We observe a growing interest in the academic literature in studying how private equity funds deploy capital. Previous research shows that market conditions such as credit conditions, competition for deal flows, market opportunities will affect capital deployment and capital calls (Robinson and Sensoy (2013); Ljungqvist, Richardson, and Wolfenzon (2020); Hüther, Schmid, and Steri (2023)). Hüther (2022) documents that the pressure from fundraising can lead to faster capital deployment, especially for less reputed funds. In other words, market conditions can delay capital deployment so that private equity funds endogenously accumulate "dry powder". In 2024, more than $2.6 trillion have been raised globally but not yet invested[1]; this represents more than 25% of the committed capital in 2024 after reaching a peak of about 56% in year 2002. Although these studies look at determinants of capital deployment in private equity, this provides little understanding of whether investors should be concerned about the recent increase in dry powder. We investigate how buyout funds with abnormal dry powder levels at the end of the investment period deploy their remaining capital and whether it is associated with a different deal selection than their previous deals or with a different deal selection than deals executed by peer funds with normal dry powder levels.

The potential issues related to dry powder originate from the structure of the private capital fund. In a typical private equity fund, general partners (GPs) collect money from limited partners (LPs) to acquire stakes in companies during the investment period, which usually lasts (contractually) 5 years after fund inception. The lifetime of the funds is typically limited to ten years; during the remaining 5 years (divestment period), the GPs exit their investments in order to realize returns. At fund inception, LPs commit to provide a certain amount of capital for investments during the investment period (committed capital), which GPs can call later as investment opportunities arrive. Consequently, part of the committed capital remains unused and serves as a buffer for future investments. GPs are compensated for their services (deal generation, selection, structuring, value adding, exit) with a fixed component (management fee) and a performance-based component (carried interest). In the vast majority of leveraged buyout contracts, management fees are computed as a fraction of the committed capital during the investment period. However, the computation basis then switches to the net invested capital (which is invested capital excluding exited investments) during the divestment period. This situation occurs 84% of the time in buyout funds compared to only 42. 6% for venture capital (VC) funds, according to the statistics provided by Metrick and Yasuda (2010). The level of dry powder of the fund thus has a direct impact

[1]Source: S&P Global (2024)

on both components of the GP compensation and results in the following trade-off, especially for leveraged buyout funds: Having a high level of dry powder close to the end of the investment period means that GPs will lose part of their management fees after the switch, but maintain the valuable option to invest later if better opportunities arrive, which would result in a higher carried interest. This situation is typical of leveraged buyout (LBO) contracts. The case of venture capital (VC) or growth funds is less obvious, given that GPs need to keep cash to reinvest in the targets according to fund investment policy. To conclude, buyout fund managers can become pressured because their contract imposes them a limited period to deploy their capital (generally of 5 years) or because the basis for fee computation changes from the investment to the harvesting phase.

Our empirical analysis covers realized investments from 431 US LBO funds with vintage years ranging from 1985 to 2013 and liquidated as of 2022. Data are collected from Preqin, which are mostly GP-sourced. We collect information on 2,379 LBO deals whose investment years range from 1986 to 2019 using both Preqin and S&P Capital IQ. We work with different subsamples of deals varying according to data availability. We could retrieve leverage information for 639 deals (additional information was retrieved from DealScan accessible via the Refinitiv Loan Connector platform) and EBITDA entry multiples for 622 deals. Some papers have access to potentially less biased data but the sample is generally small: For instance, Hüther (2022) uses a sample of 121 funds, while Song (2023) does not have access to the deal information. Furthermore, the direction of the bias for other databases sourced from investors – or limited partners (LPs) – with large bargaining power is unclear. In GP-sourced data, should our thesis be true, one could hypothesize that funds would not report bad late deals to Preqin or that funds with high dry powder would not report. As a consequence, this would only underestimate the true impact.

Consistent with previous literature, we observe that capital deployment during the investment period is related to market conditions and GP fundraising activity. The accumulation of capital is, therefore, endogenous. However, we do not find any evidence that low-reputation funds do worse or are more likely to accumulate capital than others. Funds deploy on average 95% of their capital in our sample but with a large heterogeneity: only 68% reaches a level of 95%. This implies that approximately one-third accumulate dry powder at the end of the investment period. Focusing on funds that deploy less capital compared to their peers (ie, display an abnormal level of dry powder), only 25% of them finally deploy less than 85% of their capital on average. This means that most of the funds accelerate capital deployment and catch up in the remaining two years, reaching an average deployment rate between 91% and 97%.

We condition our empirical analysis on those funds that accumulate dry powder above the top tercile of their peers and investigate their investment behavior at the end of the investment period; we observe that capital deployment under pressure cannot be explained by market conditions. We

interpret this result as consistent with the fact that deploying capital or not under pressure is a GP decision. One possible explanation can be found in the fee structure, where staying under-invested would lead to a loss in fees. We find preliminary evidence consistent with that hypothesis. We evaluate the consequence of this decision at the deal level. We show that deals executed at the end of the investment period by funds with an abnormal level of dry powder tend to be less levered, more expensive, and less performing. We also show that funds that accumulate dry powder but do not deploy this excess capital do not proceed to the same deal selection and do not suffer from these investment distortions.

Axelson, Strömberg, and Weisbach (2009) provide a theoretical framework for understanding our results. Ex ante equity financing motivates the fund sponsor – or general partner (GP) – in the early life of the fund to not invest in bad deals, as this would dilute overall fund performance. However, GPs might be tempted to overinvest close to the end of the investment period in the event of large 'untapped' capital. Overall, our analysis documents that in case of large untapped capital at the end of the investment period, the GP might overinvest in lower-quality deals rather than returning cash to investors. We interpret this situation as a potential source of misalignment between the GP and the LPs given that our results show large differences in deal performance between these two groups. This result is grounded in the agency costs related to free cash flow. As stated by Jensen (1986), corporate managers, as agents, might favor company growth to increase their compensation and power to the detriment of the equity holders, who are the principals. In a situation of excess internal funds and limited profitable investment opportunities, corporate managers can waste those internal funds to finance negative net present value projects instead of distributing the free cash flow to equity holders. This principal-agent framework also applies to PE funds for which LPs provide the capital and delegate the investment decisions to the GP. The GP's compensation structure in the form of both management and performance fees should align their incentives with the interests of LPs. However, in some circumstances, such as the accumulation of unspent fund commitments, a personal objective of GPs to maximize fee collection might enter into conflict with LP profit maximization. Accumulating a large amount of unspent fund commitments close to the end of the investment period might indeed force the GP to invest in inferior deals to collect higher management fees. We therefore reach a similar type of situation observed for corporate managers in companies with excess internal funds.

We contribute to the recent literature analyzing potential fund buying pressure related to fundraising (Hüther, 2022) or fee structure (Song, 2023), as well as documenting higher activity in secondary buyouts in times of buying pressure (Arcot, Fluck, Gaspar, and Hege, 2015; Degeorge, Martin, and Phalippou, 2016). Hüther (2022) determines that, closer to fundraising, funds with low reputation (measured as past performance and difficulty in fundraising) deploy their dry powder

faster than other funds and make bad deals. In our analysis, the majority of funds that have large dry powder at the end of the investment period tend to overinvest regardless of whether the GP is currently (or will be) in fundraising. In addition, Arcot et al. (2015) show that funds with buying pressure are more likely to execute SBOs. Degeorge et al. (2016) show that SBO deals bought late with excess cash under-perform while PBOs do not. We demonstrate a more general effect, and our results suggest that these findings go outside the SBO markets. However, we could not relate this phenomenon to the characteristics of GP. We found some preliminary evidence that it might be more severe for funds with high management fees, as the opportunity cost of being under-invested is more important. However, given the very complex fee structure in PE funds with a significant lack of high-quality data, it is difficult to conclude. Our results are consistent with the fact that the observed overinvestment aims at maximizing the collection of revenue.

Our research contributes to the literature on PE performance by analyzing whether the GP maximizes the value for LPs. Most of the papers conclude to outperformance when they compare PE raw returns to public market returns (Chung, Sensoy, Stern, and Weisbach, 2012; Harris, Jenkinson, and Kaplan, 2014; Robinson and Sensoy, 2016). However, several methodological issues remain to be solved, such as how to measure risk in PE or what is the appropriate benchmark for performance (Phalippou and Gottschalg, 2009; Brown, Gredil, and Kaplan, 2019; Phalippou, 2020). Our paper does not focus on these methodological issues, but highlights how GP overinvestment could impact fund performance.

The examination of the effects of dry powder on deal distortions and performance suffers from endogeneity issues. Dry powder is correlated with fund characteristics that, in turn, is correlated with deal and fund performance. An example is GP quality. High-quality GPs may have a better deal flow and face a lower level of dry powder at the end of the investment period. Furthermore, deals of high-quality GPs may be associated with better performance. In this situation, we would observe a negative correlation between high dry powder and performance, but this effect would be driven by an unobserved GP quality. To account for unobserved GP quality, we rerun our main deal-level regressions with GP-fixed effects as a robustness test. Our results are also robust to the time-varying characteristics of GPs such as the reputation of the GP or its fundraising activity. Given that the propensity to deploy dry powder can be related to fund characteristics and that fund characteristics can be associated with deal characteristics, we test the robustness of our main results using an instrumental variable to estimate the exogenous part of dry powder. Our results remain the same.

The literature studying the direct effects of dry powder is scarce. Recently, Jelic, Zhou, and Ahmad (2021) examine the potential earnings management of PE funds and show that they are more likely to misbehave if the GP faces funding pressure. They provide evidence that dry powder

mitigates incentives for earnings management. Similar findings on reported returns and net asset value can be found in Barber and Yasuda (2017) and Brown et al. (2019). Several studies examine profit sharing agreements between GP and LPs, mobilizing the agency theory to understand potential effects of fees (Robinson and Sensoy, 2013; Song, 2023). Robinson and Sensoy (2013) reveal that funds tend to delay exit when the basis for fee computation switches to invested capital and exit early around waterfalls to secure their carry[2].

This paper proceeds as follows. Section II describes the data and presents some preliminary results. Section III presents the main empirical analyses. Section IV discusses issues such as endogeneity and omitted variables and provides robustness tests. Finally, Section VII concludes the paper.

II. Data and descriptive statistics

Our database is the result of a merge of three datasets: Preqin, S&P Capital IQ and Deal Scan from Refinitiv-LSEG.

First, sourcing from the Preqin database, we gathered 1,231 US LBO funds with vintage years ranging from 1985 to 2013, all of which were liquidated in 2022. Our sample drops to 431 funds when requiring availability of dry powder information of these funds. We define dry powder as a variable that varies over time, measuring the fraction of uninvested capital over the total committed capital of a fund [3]. Therefore, it represents the percentage of committed capital that has not yet been invested. We construct the dry powder variable using the Private Capital Cash Flow Module from Preqin.

Despite an important dropout rate (i.e. 65%), our sample size is comparable to previous international studies that also use Preqin: Brown, Harris, Jenkinson, Kaplan, and Robinson (2015) report 836 funds from 1984 to 2010 in North America, while Hüther (2022) reports 851 North American funds with vintage years between 1996 and 2010. Our sample focuses on the US market, which constitutes approximately 88% of the Preqin North American sample.

Then, we matched the sample of LBO funds with their corresponding US deals, merging information from Preqin and S&P Capital IQ. We were able to retrieve a total of 6,376 fully realized deals. We focus on their US deals to minimize the effects of accounting rules on reporting deal characteristics (such as EBITDA) [4]. Finally, we complete information on leverage on these deals using

[2]Robinson and Sensoy (2013) do not find inefficiency in the GP-LP contract, but demonstrate that, under certain circumstances, GPs can exploit some contractual features such as exit decisions to magnify their fee collection.

[3]Dry powder is is computed as one minus the ratio of the total amount of the transactions (invested capital) to the committed capital.

[4]We could also retrieve 306 international deals for these US funds. These deals share similar characteristics to the US deals. All our empirical results are valid when these observations are added. Results are available upon request.

Refinitiv Loan Connector, which includes access to DealScan, a source of historical information on global loans. However, requiring some minimum information to conduct our deal-level analysis – such as the entry price, entry multiple, cash return, deal size and duration, leverage – our largest sample drops to 2,379 deals, with an investment year between 1986 and 2019. Data available on private deals are scarce. For comparison, the recent paper of Hüther (2022) works with a sample of 1,187 fully realized deals. Braun, Jenkinson, and Stoff (2017) report a sample of 3,121 fully realized deals in North America from 1974 to 2010, of which Preqin reports that US deals represent 92%.

A. Fund-level data

A.1. Summary Statistics

As in other papers relying on data mostly reported by PE funds, we acknowledge that our sample could suffer from a selection bias. We perform a probit analysis (following Cressy, Munari, and Malipiero (2007)) to investigate the propensity to report dry powder information. The results of the probit analysis are shown in Table I. The definitions of the fund variables are presented in the Appendix – Table A1.

[Insert Table I]

Our set of independent variables includes two variables that capture the GP profile. First, we build a "GP low reputation" variable by following Barber and Yasuda (2017) which define less reputed GPs as small, young and lacking strong performance track record [5]. Our sample includes approximately 41% of funds run by low-reputed PE firms. Second, we build a fundraising dummy equal to 1 if the PE firm is in the fundraising phase for a follow-up fund when the tested fund is close to the end of the investment phase (i.e., from vintage year + 4 to + 6). More than 50% of the funds have a follow-up fund in fundraising in that period. We also include a dummy variable that indicates whether the GP reported dry powder information for the previous fund in the same series. The latter variable is further split into two dummies: the first (second) variable is equal to 1 if the GP already displayed high dry powder (i.e. at or above median) (resp. low, below median) dry powder at vintage year + 4 for the previous fund.

The probit analysis reveals that larger funds and funds for which the GP already displayed dry powder information for their previous fund tend to more frequently disclose dry powder information to Preqin. We do not observe any difference in the propensity to report information between GPs

[5] Following Barber and Yasuda (2017) this means "small" (less than $1B of accumulated committed capital before the tested fund), "young" (less than 3 funds launched before the tested fund) and "lacking of a strong performance record" (we use Preqin dummy indicating whether a fund is a top quartile among a peer group made of fund of similar vintage years and geographical focus. To qualify for this last condition, the GP should not have any top quartile funds in the same fund series (the same investment strategy) at the time of the inception of the fund). This represents a triple condition. If one of the three conditions fails, the fund is not classified as "Low Reputation".

with high and low dry powder in their previous fund (see Column (2)) [6]. Furthermore, funds for which the GP already reported performance metrics for previous funds – within similar series – tend to report more frequently dry powder information; however, we do not find differences across the performance quartiles (the reference category in the regression are past funds for which we do not have performance metrics). Funds for which the GP is currently in fundraising activity tend to report their dry powder information more frequently. However, GPs with a better reputation are less likely to report dry powder information.

Although the probit analysis does not support this hypothesis, we cannot rule out the fact that, since our data are mostly sourced from GPs, they might be biased towards what is best for funds to report. However, should our thesis hold, our results would be underestimated, and the real effect would be even larger. Some papers have access to less biased data, but the sample is generally small. For example, Hüther (2022) uses a sample of 121 funds, while Song (2023) does not have access to deal information. Furthermore, the direction of bias for other databases sourced from LPs with a large bargaining power is unclear.

Table II – Panel A displays summary statistics on the 431 funds sponsoring LBO deals.

[Insert Table II]

The average fund size (measured by the committed capital) is approximately $2 billion[7]. The average total value over paid-in capital (TVPI) at the end of the fund life, which sets distributions in relation to the invested capital, is 1.75. This value is comparable to those reported in previous studies (Harris et al., 2014)[8]. The average Kaplan-Schoar Public Market Equivalent (KS-PME) at the end of the fund life is 1.38[9]. The average management fee is 1.81%, with a standard deviation of 37 basis points and a large positive skewness, and the average carried interest amounts to 19.92%[10].

The mean value of dry powder as a percentage of the committed capital three years after the vintage year is 26%, with a standard deviation of 17%. This means that on average about 75% of the investments in our sample are made within the first three years after the vintage year. This is consistent with market practice and the earlier findings. Ljungqvist and Richardson (2003) observed that 50% of the funds invested 70% of their committed capital in the first three years. Similarly, Giot, Hege, and Schwienbacher (2014) and Metrick and Yasuda (2010) report the same level of dry powder, with 74% and 75% in the third year of the fund, respectively. Between Y4 and

[6] We perform an incremental analysis (untabulated), and we do not find any significant difference.

[7] Similar to other studies (Robinson and Sensoy, 2016; Brown et al., 2019; Jenkinson, Kim, and Weisbach, 2021), we observe a large standard deviation for this variable in our sample.

[8] Harris et al. (2014) display an average TVPI of 1.72 for buyout funds.

[9] KS-PME is the ratio of the present value of calls over the present value of distributions plus the residual net asset value (NAV). In contrast to TVPI, KS-PME accounts for the time value of money using the S&P500 as the the minimum remuneration. The discount rate comes from the public market index return; we use the S&P500.

[10] Our data on carried interest lack variation; 92% of the funds report a carry of 20%.

Y6, dry powder decreases by approximately 9%, but there is substantial variation between funds.

As a last descriptive analysis, Table II – Panel B displays descriptive statistics on LBO funds sorted according to their respective levels of dry powder in vintage year + 4. "High-dry powder Y4" and "Low-dry powder Y4" refer to the groups of funds in the third and first terciles, respectively, among funds of similar vintage years [11]. Compared to the other group, LBO funds with high levels of dry powder display significantly lower TVPI and KS-PME. Finally, LBO funds with top tercile dry powder tend to be less frequently in a fundraising phase, to exhibit a lower size, to be managed by less reputed GPs, and with lower past performance.

A.2. Survival Analysis: Fund Capital Deployment

We explore in more detail the capital deployment in Table III.

Panel A presents statistics on the capital deployment of the 431 funds over their entire lifetime. On average, the funds gradually deploy 85% of their committed capital by year 4 and reach a deployment rate of more than 90% by year 5 (as already illustrated in Panel A of Table II). However, this table gives a better view of the heterogeneity of capital deployment across funds. While in vintage years +2 or +3, the low-tercile group of funds has invested much less capital than the average of the peers (in Y3 49% for the low-tercile group versus 56% for the peers, in Y4 67% vs. 74%), most of them catch up during the remaining investment period to achieve the level of 95% from the vintage year +7). This observation means that to reach their objective, they need to quickly deploy capital at the very end of the investment period, that is, between Y4 and Y6. Panel B analyzes this situation, that is, the capital deployment of funds which have accumulated a high level (or abnormal level) of dry powder in Y4. We define "High DP Y4" as a dummy variable equal to 1 for funds whose dry powder in Y4 exceeds or equals the highest tercile value of dry powder of the peer funds [12]). On average, these funds deploy 92% of their capital (line 1). One third of them decide to slow down capital deployment to finally stay underinvested (line 2 on Low DP Variation which shows an average capital deployment of 84%).

Finally, Panel C displays the distribution of funds according to their final capital deployment. We consider separately the whole sample of funds and the subsample that displays an abnormal level of dry powder at vintage year + 4. While 68% of funds deploy 95% or more capital, this proportion falls to 48% among the sample of funds with high dry powder funds at the end of the investment period. This confirms that some funds stay underinvested. It could be that they do not have the skills to deploy this remaining capital or that they decide to stay underinvested. This

[11] We aggregate funds in cohorts based on their vintage years, using a five-year period, starting in 1985 such as 1985-1989. For instance, funds with a vintage year from 1985 to 1989 or funds with a vintage year from 1990 to 1994 are grouped.

[12] We also group funds into five-year intervals.

will be further investigated below. The time to deploy capital is also significantly increased for the latter sample of funds, confirming the slowdown in capital deployment for the sample of funds with high DP in vintage year + 4.

[Insert Table III]

To further investigate how private equity funds deploy their capital, we employ a duration model capturing the time the private equity funds take to deploy their committed capital during the investment period (which we consider up to year 6). Similarly to Hüther (2022) and Ljungqvist et al. (2020), we use a Weibull distribution to account for the fact that the hazard to be fully invested increases with time. As it is common practice for funds to not use 100% of the capital (Ljungqvist et al., 2020), we consider the threshold of 70% which corresponds to the usual contractual minimum required to raise follow-up funds. Our model combines in one model all the explanatory variables documented so far by the literature. We start by considering the same model as in Ljungqvist et al. (2020), including variables that capture the characteristics of the funds and market conditions. This includes (i) a proxy for investment opportunities measured by the annual value-weighted book to market calculated from all listed US available in Compustat, (ii) two proxies for capturing competition for deal flows (measuring the total cash to deploy by all US buyout funds sharing the same vintage year and expressed in logarithm and in dollars adjusted for 2010 purchasing power, or measuring the concentration of uninvested capital though the Herfindahl index, the more concentrated, the less competition), (iii) and finally a proxy capturing the cost of capital using the annual credit spread between corporate BAA bonds and 3-month treasury bills (high credit spread periods are defined as periods where the credit spread is above the median value) such as in Hüther (2022) . We add a dummy variable on fund reputation similar to Barber and Yasuda (2017) and fundraising (Hüther, 2022) to capture whether the fund is currently in fundraising or preparing a fundraising (considering a lag of 1 year). We include vintage-year fixed effects (grouped by period of 5 years, starting at 1985 to 1989) to distinguish time effects from specific market conditions in the private markets. In other words, this allows us to analyze the capital deployment within cohorts of funds facing the same economic conditions.

Table IV presents the results.

[Insert Table IV]

Column 1 replicates Ljungqvist et al. (2020) for a threshold of 70%. We observe that when market opportunities become scarce (in case the book-to-market index becomes higher than its median value over the period) or the higher the competition among buyout funds (proxied by high quantity of capital to be deployed or low market concentration of the uninvested capital across many private equity funds), the slower the capital deployment. Tighter credit conditions

will also delay capital deployment, as also demonstrated theoretically in Axelson et al. (2009). These results hold when adding other variables, such as fund reputation or fundraising activity, that could also impact private equity capital deployment. Starting a fundraising phase accelerates capital deployment. Funds of larger size also tend to deploy capital faster. We also confirm the results from the literature that the main economic variables that influence capital deployment are related to market concentration and credit conditions, as well as fund activity in fundraising. This explains why some funds tend to accumulate capital at the end of the investment period. As discussed in (Robinson and Sensoy, 2016), the accumulation of dry powder is therefore endogenous.

However, in this paper, we innovate by investigating the capital deployment of funds that have accumulated an abnormally high level of dry powder. We define an abnormal level of dry powder as the situation where unspent capital is above the value displayed by the top tercile of the peer funds that have similar vintage years, grouped by period of 5 years. We therefore repeat the analysis and model how they deploy capital at the very end of the investment period (i.e., between periods 4 and 6).

Table V presents the results.

[Insert Table V]

We modify the dependent variable of the previous duration model and consider the time to drawdown 20% of the committed capital between vintage years +4 and +6 for the subsample of funds with abnormal dry powder. Our analysis shows that traditional economic variables no longer affect the capital deployment of these funds during this period, except in times of high credit spread, which have been shown to slow down capital deployment (Axelson et al. (2009)). This suggests that the time used to deploy the remaining capital is a decision of the funds, neither explained by market competition nor by the fund reputation.

A.3. Fund performance

Finally, we investigate the relationship between fund performance and capital deployment. We control for fund past performance, fundraising activity, reputation, and fund size as well as potential selection bias using a two-stage Heckman procedure. The first stage corresponds to the probit discussed in Table I.

Table VI presents the results for three levels of capital deployment between vintage years +4 and +6, as shown in Table III – Panel B. Panel A measures fund performance through the TVPI, Panel B uses the KS-PME.

[Insert Table VI]

Panel A shows the effects, within each group, of capital deployment at the end of the investment period on fund performance. We observe an almost linear effect, with increased negative impact

on performance for large capital deployment at the end of the investment period. The effects are strong and significant across all specifications and barely change with the addition of control variables. Table A4 in the Appendix repeats the same analysis but tests the incremental effects with regard to the category of fund that decides to stay under-invested (see Table III Panel B). Funds that decide to use a large part of their remaining capital to reach the above 90% threshold have significantly lower performance compared to funds that slow down the use of their excess cash. These results suggest that large capital deployment at the end of the investment period might lead to a misalignment of interests between GP and LPs, as GP tend to privilege capital deployment over maximizing returns.

[Insert Table A4]

B. Deal-level data

Table VII displays descriptive statistics on the LBO deals. The definitions of the deal variables are presented in the Appendix – Table A2.

[Insert Table VII]

Panel A presents statistics for the full sample of US LBO deals performed by the 431 LBO funds. All variables are winsorized at the 1% level, except for the variable deal club for which a symmetric winsorization is not feasible. Our LBO deals have an average duration of five years and an average total enterprise value of $821 million. The cash return (multiple) is slightly greater than 2, the EV / EBITDA entry multiple is approximately 10.3, with a debt-to-enterprise value (leverage) close to 60%. We convert the cash return into an IRR measure using the duration of the deal. The average IRR is 10% close to the value reported in Barber and Yasuda (2017) and Robinson and Sensoy (2016). The standard deviation is large (almost 33%); it is not rare to see PE funds reporting large extreme IRRs[13]. The summary statistics are similar to other studies (Axelson, Jenkinson, Strömberg, and Weisbach, 2013; Arcot et al., 2015; Robinson and Sensoy, 2016; Hotchkiss, Strömberg, and Smith, 2021)[14].

Panel B focuses on late LBOs (performed after vintage year + 4) and compares the entry EV/EBITDA multiples, leverage, size, and cash return for late deals executed by funds classified

[13]For instance, one example in our sample is the deal on the company Horizon Line which was acquired by Carlyle Group on December 5, 2002, for a price of $300 million. Eighteen months later, on May 23, 2004, Carlyle Group sold Horizon Line for a price of $650 million, which constitutes a cash return of 2.16 and an IRR of 67%.Robinson and Sensoy (2016) also report a standard deviation of 28% for the IRR.

[14]Arcot et al. (2015) display an average total enterprise value of $886 million and an average sales multiple of 1.36. Hotchkiss et al. (2021) report average target revenues of $1,678 million and an average EBITDA margin of 15%. Barber and Yasuda (2017) display an average IRR of 11.1% and Robinson and Sensoy (2016) of 12%. Finally, Axelson et al. (2013) has an average EV / EBITDA of 8.2.

in the top and lowest tercile of dry powder one quarter before the deal is executed (again, relative to other deals executed by other funds of the same fund age). In this raw analysis without any controls, the differences in leverage, deal size, and syndication are significant. Funds sponsoring late deals and accumulating dry powder close to the end of the investment period differ in terms of size and fundraising phase: These funds tend to be smaller and less frequently in a fundraising phase[15]. Following Chung et al. (2012) and Hüther (2022), we expect funds open to fundraising to have reduced levels of dry powder.

III. Empirical analysis

In this section, we examine the characteristics of the deals that GPs execute close to the end of the investment period, that is, four years after the vintage year and later (hereafter called "late deals") when they accumulate an abnormal level of dry powder. We proceed to two comparisons. First, we examine whether those deals differ significantly from deals executed with normal to low level of dry powder. Second, we also compare the terms of the deals executed by funds with abnormal levels of dry powder that either decide to remain underinvested (by deploying less than 10%) or that adopt a more aggressive approach (by deploying more than 20% of dry powder over the remaining two years of the investment phase).

In both analyses, our multivariate analysis considers the following terms or conditions as dependent variables on the LBO deal d carried out at time q, i.e. the distance in quarters with respect to the vintage year: leverage of the deal, the natural logarithm of deal size, the entry EV/EBITDA multiple, the deal club, and finally its cash return and estimated IRR. Our testing variable is of three types: (i) the level of dry powder one quarter before the deal is executed, (ii) a dummy variable indicating whether the level of dry powder is abnormally high with regard to the fund peers (abnormal level exceeds the top tercile of funds within the same range of vintage years considered over a 5-year period), and (iii) the deployment rate of the dry powder at the end of the investment period.

Many other factors may affect these deal characteristics. First, following Chung et al. (2012), Arcot et al. (2015), Degeorge et al. (2016), and Barber and Yasuda (2017), we control the size of the fund and of the deal. Then, funds might be active in different industries and deal characteristics differ across industries. To account for these factors, we add industry-fixed effects. Moreover, deal characteristics vary over time because they depend on market conditions. We address this issue by adding fixed effects on the investment year as well as a series of economic variables explaining fund

[15] PE firms usually raise capital for a new fund every three to five years (Chung et al., 2012). Some funds have a clause requiring that 70% of their committed capital must be invested before launching a new fund (Financial Times, June 18, 2019, "Private equity groups prepare to raise mega funds.")

capital deployment as illustrated in Section II.A.2 (e.g., market concentration, credit conditions, market opportunities). In addition, we account for the reputation of the GP following Barber and Yasuda (2017), and whether the GP is in a fundraising phase following Hüther (2022).

The model is given by Equation 1.

$$Deal\ terms_{d,q} = \beta DP_{d,q-1} + \delta LD_{d,q} + \omega DP_{d,q-1} \times LD_{d,q} + \gamma_1 Z_d + \gamma_2 Z_{d,f} + \gamma_3 Z_{d,m} + \gamma_4 Z_{dFE} + \epsilon_d \quad (1)$$

where $DP_{d,q-1}$ is the level of dry powder or a related measure described above one quarter before the deal is executed, $LD_{d,q}$ is an indicator for late deals equal to 1 if q is greater than or equal to 16 (or four years from the vintage year), Z_d represents controls for other deal characteristics (natural logarithm of deal size), $Z_{d,f}$ represents fund sponsor control variables (fund size, GP low reputation dummy [16], and GP fundraising dummy[17]), $Z_{d,m}$ represents the market control variables (value-weighted mean of the book-to-market ratio of US firms, the concentration of the dry powder in the LBO market (using the Herdfindahl index), the value of the credit spread), and Z_{dFE} represents the deal-fixed effects (industry and investment year). Following Arcot et al. (2015), standard errors are clustered by investment year. From the descriptive statistics presented in Section II, we observe that the level of the testing variable, that is, dry powder, is related to the characteristics of the GP and the fund, which influence the terms of the deal themselves. This problem of endogeneity will be addressed in Section IV using a an instrumental variable.

A. Accumulation of dry powder and deal selection

This sub-section examines the deal terms selected by funds with an abnormal level of dry powder. In the appendix, we also consider the level of dry powder expressed in percentage of the committed capital [18].

Tables VIII to XI present the results of the regression for the deal leverage, the entry EBITDA multiple, the deal cash return, and its estimated IRR. The results on deal size, deal syndication and deal duration are presented in the appendix at Table A5.

[Insert Table VIII – XI]

Across these different tables, we observe no significant differences in characteristics between early and late deals, as shown by the mostly insignificant late deal variable. The abnormal level

[16] Dummy variable which takes the value of 1 if the GP is small, young and lack strong performance track record

[17] GP fundraising dummy takes value 1 if the deal is executed during a fundraising period of a follow-up fund, zero otherwise. See Table A1 for the definition of the fundraising period.

[18] We observe from the descriptive statistics (and as illustrated in Panel B of Table III) that the dispersion in the value of capital deployment and therefore dry powder is large for funds displaying abnormal level of dry powder, i.e., above top tercile levels from year 4 onward.

of dry powder is not significantly related to the characteristics of the deal, except for the entry multiple. A lower entry multiple (see Table IX) associated with abnormal dry powder could be explained by the fund better positioning (that is the financial slack) to seize good deals or to negotiate deal terms.

Our interest lies in how dry powder at the end of the investment year and deal characteristics correlate in Table VIII. We are mainly interested in the coefficient ω of Equation 1. Deals performed toward the end of the investment period by funds with abnormal dry powder are associated with lower leverage. The coefficient remains negative and significant in all specifications; the coefficients barely change when more controls or fixed effects are added. Late deals executed by funds with dry powder above the top tercile of their peer group at the end of the investment period tend to present close to 10 pp less leverage (in proportion to the enterprise value). These findings are consistent with Arcot et al. (2015), who demonstrate that SBO deals made by funds under buyout pressure (measured by a set of criteria, including the level of dry powder) are less leveraged to avoid a loss in fee collection. Similarly to them, we interpret this situation as evidence supporting the agency view that excess cash at the end of the investment period can pressure funds to deploy capital.

In Table IX, we examine the relationship between the abnormal level of dry powder, late deals, and the deal entry EV/EBITDA multiple. We observe a positive and significant (at the 5 percent level) association between the entry multiple and the fact of presenting abnormal dry powder at the end of the investment period. With regard to early deals executed with the "normal" level of dry powder, late deals executed with abnormal DP are more expensive: The difference of multiple is economically large of magnitude 1x EBITDA (i.e. from column (8), 1.902 + (-0.901) + 0.00781).

In the Appendix, we consider the link between dry powder and deal size, deal syndication, and deal duration (Table A5) respectively. Dry powder does not appear to significantly affect deal size, while traditional control variables such as fund size are associated with deal size. Less reputed funds or funds in fundraising tend to execute smaller deals (which is consistent with Hüther (2022) and is explained by the pressure to deploy capital). Tighter credit conditions also lead to smaller deals. We do not observe any association between dry powder and deal syndication decision, but deal syndication is related to control variables. It makes sense to observe less syndication for deals executed by large funds but more syndication for larger deals. Market conditions are also associated with the propensity to syndicate deals. We also test the impact of dry powder on the duration of late deals, but do not find any significant relationship.

The results displayed in Tables VIII to IX indicate that an abnormal level of dry powder close to the end of the investment period is associated with different deal characteristics: higher entry multiple, lower leverage. Both results are consistent with the thesis developed by Arcot et al. (2015) and Degeorge et al. (2016) analyzing the specific case of SBOs: Funds under buying pressure will

prefer to pay higher price and decrease leverage to deploy more equity capital. Our results generalize these findings to all types of deal, whether they are SBOs or PBOs. To investigate whether these deviations in deal characteristics might be considered as deal distortions, we show in Tables X and XI whether this situation of abnormal dry powder materializes in lower deal performance, which could be seen as a misalignment in deal selection between the GP and LPs. As the lower leverage documented in Table VIII could mechanically reduce the return of the deal from the point of view of shareholders, we work with performance measures based on the value of the company. First, we examine the cash return of the deal in Table X. Late deals executed by funds with an abnormal level of dry powder are associated with a lower cash return. These results are robust to deal size and other controls, including variables such as lack of investment opportunities (book-to-market ratio). The economic magnitude is large. We observe a decline in the cash return multiple of 0.7 for funds corresponding to a 10 pp drop in IRR (Table XI).

The results when using the absolute level of dry powder instead of an abnormal level with respect to peers are displayed in Table XII. Our results hold.

B. Capital deployment decisions and deal selection

We examine funds that accumulated abnormal capital at the end of the investment period and test whether the performance of those funds varies with the deployment rate of the dry powder. We previously observe that the decision to deploy capital by GP between vintage years +4 and +6 does not depend on external market conditions such as market opportunities, competition or on any activity of fundraising. Only credit conditions could affect our results [19]. In other words, the use of cash at the end of the investment period obviously depends on the level of dry powder which has been accumulated but still remains the decision of the GP close to the end of the investment period: at vintage year + 4, the GP could decide to return the cash which is not at work or propose to put the cash to work in a follow-up fund open to fundraising. Examining the deployment rate allows us to test the potential investment distortions associated with dry powder. For that, we reproduce the same multivariate regression as in the previous subsection but considering different levels (0 up to (included) 10%, 10% to 20% and above 20%) deployment of dry powder over the period Y4 and Y6 as the testing variable. Should we have a direct link between excess cash deployment and distortions, controlling for credit conditions, we should find a significant coefficient on the triple interaction Abnormal DP x Late Deal X High DP Var Y4-Y6.

Results are displayed in Table XIII.

[Insert Table XIII]

[19] Credit spread conditions tend to be negatively correlated with the time to drawdown capital (see Section II.A.2).

Panel A presents the analysis splitting the effects of abnormal level of dry powder into three categories as if we were doing three separate regressions. Each column corresponds to one deal term, respectively: leverage, entry multiple, cash return and IRR. For all these deal characteristics, we have a significant coefficient for the high dry powder variation and deal terms (negative link with leverage and performance measures, positive link on entry multiple) on each deal characteristic. Only the largest capital deployment is related with a decrease in leverage, in performance, and an increase in entry multiple. Panel B tests the effects incrementally to the other deployment rates. The reference category is the sample of funds that spend between 0% and 10% of committed capital between vintage years + 4 and + 6. Using both performance measures, we observe, among funds with large untapped capital in Y4, a significantly lower performance for funds spending 20% or more dry powder between vintage years + 4 and + 6.

C. Management fee structure

Our results are consistent with the thesis that GPs tend to overinvest at the end of the investment period of the fund should they have a large amount of cash to deploy. We show that their behavior could not be explained by economic conditions, nor by their fundraising activity or their reputation. We further show that when deploying large amounts of capital, they tend to maximize equity over debt by underlevering deals, paying an entry premium on the entry multiple with negative consequences on the deal performance. Funds that decide not to deploy their excess cash at the very end of the investment period do not suffer from these distortions and present better performance.

One possible channel explaining our results could be the motivation of the GP to avoid opportunity costs in fees should they remain underinvested. If this thesis were true, the evidence described in this paper would be even stronger for funds with high management fees or for funds which switch the basis for fee computation.

Although data on fee structure is limited, we test this idea using a sample of 159 funds for which we have the level of management fees and a subsample of 117 funds for which we have the basis for fee computation. We examine how the coefficient on Abnormal DP $\times$ late deal from equation 1 varies according to the subsamples of deals sorted according to the management fee structure (fee level or basis for fee computation) of the related funds. Given the data limitations, we do not test for incremental effects. These results are displayed in Table XIV.

[Insert Table XIV]

In Panel A, we distinguish between funds with high and low management fees: high management fees are defined as 2% or above - up to 3.75% with a mean of 2.02%, whereas low management fees are defined as below 2% - it ranges from 0.5% and 1.88% with a mean of 1.45% -. The table

supports the fact that leverage or entry multiple distortions do not hold in funds charging low management fees. High dry powder close to the end of the investment phase only bears on the deal cash return for funds with high levels of management fees.

Another key variable explaining the buying pressure associated with dry powder near the end of the investment period is the basis for the management fee calculation. By switching from committed capital to invested capital, most LBO fund managers are under buying pressure close to the end of the investment period to protect their management fee collection.

Panel B reveals that the magnitude of the effects of dry powder on late deal characteristics are larger for the subsample of funds that switch the basis for fee computation from committed to invested capital than for the full sample used in the main tables.

Our deal-level analyses show that the management fee structure interacts with our results: As expected, funds with low management fees or that do not switch the basis for fee display weaker results on the relationship between dry powder and performance of late deals. Given our previous results documenting a significant negative effect on the total fund performance, should it be related to a mechanical drop in performance for all LBO funds that accumulate dry powder, we should not observe any significant difference between funds with different management fee structures. This constitutes only preliminary evidence given the lack of data on fee structure in PE.

IV. Robustness tests

Our results are consistent with the thesis of "GP overinvestment" under the pressure of excess dry powder. GPs deploy large quantity of dry powder at the end of the investment period leading to a drop in performance.

A. Alternative specifications

We first test the robustness of our main (deal) analyses for alternative fixed-effects and different samples.

Tables XV to XVIII present the results for the deal leverage, entry multiple and performance measures. Panel A uses abnormal level of dry powder as the variable of interest. Panel B uses capital deployment levels.

[Insert Tables XV - XVIII]

Column (1) of each table reproduces the main results obtained in Section III.B for comparison purpose. Column (2) add GP-fixed effects which control for cross-sectional variation in their skills regarding deal selection (that would jointly affect the level of dry powder and deal quality). Column (3) works on a subsample of PBO deals. We show that our main results on deal leverage, entry

multiple and performance also hold for this subsample: This generalizes the results of Arcot et al. (2015) and Degeorge et al. (2016) [20].

Finally Column (4) uses time x industry fixed-effects instead of considering them independently. Results hold.

B. Omitted variables

Our results might also be consistent with an omitted variable story where limited investment opportunities drive both deal quality/returns and fund dry powder. Limited opportunities early on during the investment phase would lead to dry powder, and those limited investment opportunities might persist and lead to worse returns. However, our results show that among the groups of funds that accumulate dry powder, we observe very different reactions when deploying this capital; these investment patterns are neither related to market conditions nor to fund characteristics. Only large capital deployment is associated with investment distortions and a drop in performance. We interpret this as a consequence of the GP decision.

One classical econometric method to address an omitted variable problem or an endogenous variable is the use of instrumental variables. In our setting, it is difficult to find an instrument that meets the exclusion and relevance rules. Potential external estimators that determine the level of dry powder, such as market conditions, directly affect investment opportunities as well as deal flow and performance. We therefore construct a synthetic instrument following Lewbel (2012). The method consists in constructing a heteroskedasticity-based regressor for the endogenous dry powder estimate. The use of such constructed instruments is recent but has increased in the corporate finance literature. It has been used in a context where an external IV could not be found (Mavis, McNameeb, Petmezasa, and Travlos, 2020; Chen, Ofosu, Veerarghavan, and Zolotoy, 2023) or as a robustness test (Peng, Colak, and Shen, 2023).

When executing the internal IV setting, we follow the advice of Baum and Lewbel (2019) and verify the instrument exogeneity using the J-test developed by Sargan (1958). We replicate our main table of results (see Tables VIII - XI) using the synthetic IV in Table XIX. TableA6 displays the first-stage regression.

[Insert Table XIX]

The table supports our main findings because our variable of interest remains significant and similar to the coefficient in Tables VIII - XI. Furthermore, we perform the J-test of Sargan (1958) and did not reject the null hypothesis of overidentification between the instruments and error

[20] We replicate the analysis over the same sample period as in Degeorge et al. (2016) (1986-2007) and confirm their previous results (untabulated) : the effects mostly concentrate among SBO deals over their specific sample period.

terms[21].

V. Concluding remarks

Capital deployment by private equity funds is endogenous to economic conditions. Our results, however, suggest that at the end of the authorized investment phase, buying pressure could influence the GP decision to deploy capital: Some GPs will decide to deploy rapidly the remaining capital, some will slow down the capital deployment. We show that funds that opt for fast capital deployment undertake deals with lower leverage and with a higher entry price. We show that these deals tend to underperform early deals, but also, and more importantly, underperform deals undertaken by funds that slow down the capital deployment. This situation suggests that while LBO contracts between GPs and LPs might be efficient ex ante, the accumulation of cash (dry powder) might create investment distortions or inferior deal selection close to the end of the investment period. This potentially creates an ex post misalignment of the interests of the different parties in the selection of deals.

Our theoretical stance is that the inefficiencies mostly emanate from the tendency of the GP to overinvest the committed capital. We demonstrate that this leads to lower performance.

Testing the impact of dry powder on the investment decisions of LBO funds is not a straightforward exercise, because we face a challenge that is common in corporate finance: We lack exogeneity in the test variable, i.e., dry powder. The accumulation of dry powder might be the result of the fund lacking skills in deal selection, the latter being jointly determined with the deal and fund performance. Still, our results do not seem to be consistent with this alternative hypothesis given that our results hold in an instrumental variables, when adding GP fixed-effects capturing unobserved GP characteristics and when investigating the cross-sections of funds, it only holds for funds that deploy a large amount of dry powder and not for others, although they present the same level of capital to deploy.

Our research has policy implications regarding the importance of management fees in the alignment of interests between LPs and the GP. We believe that this deserves to be a subject of future research and requires more transparency on the fund fee structure. Although practitioners have focused on carried interest to align incentives between the two parties, our results suggest that in special circumstances that lead to the accumulation of dry powder (such as market conditions), the structure of the management fees plays an important role in aligning the interests of LPs and the GP. These results are of interest not only to academics but also to LPs to navigate this opaque

[21] This is true for all our specifications except the specification where Ln Deal Size is the dependent variable. For this regression, the results of the IV should be interpreted with caution.

industry.

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Table I – Dry powder disclosure: Probit analysis.
This table displays the results of a probit regression where the dependent variable is whether the private equity fund discloses dry powder (DP) information. The analysis is performed on 1,231 US LBO funds with vintage years ranging from 1969 to 2013, all liquidated in 2022 (source: Preqin). "Past Fund Low DP" ("Past Fund High DP") variable is defined as equal to one if the dry powder in vintage year + 4 (Y4) of the previous family fund is below or equal (resp. above) the sample median dry powder of funds following the same strategy and having the same vintage year. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level. Definitions of fund variables are presented in Appendix – Table A1.

	$\mathbb{P}$(DP Disclosure)	
	(1)	(2)
Past Fund DP Inform.	0.400***	
	(0.108)	
Past Fund Low DP (Y4)		0.393***
		(0.130)
Past Fund High DP (Y4)		0.411***
		(0.151)
Q4 Past Perf.	0.569***	0.570***
	(0.128)	(0.128)
Q3 Past Perf.	0.427***	0.426***
	(0.122)	(0.122)
Q2 Past Perf.	0.568***	0.567***
	(0.130)	(0.130)
Q1 Past Perf.	0.650***	0.650***
	(0.171)	(0.171)
Ln Fund Size	0.341***	0.341***
	(0.0389)	(0.0390)
GP Low Reputation	0.475***	0.475***
	(0.103)	(0.103)
Fundraising Y4-Y6	0.141*	0.142*
	(0.0824)	(0.0826)
Number of Observations	1,231	1,231
Pseudo R^2	0.1345	0.1345

Table II – LBO funds: Summary statistics.
Panel A displays summary statistics on 431 US LBO funds with vintage years ranging from 1985 to 2013, all liquidated in 2022 (source: Preqin). Panel B split funds into terciles according to their level of dry powder at vintage year +4 (Y4). "High Dry Powder Y4" and "Low Dry Powder Y4" refer to the groups of funds in the third and first tercile respectively, among funds of the same vintage year (5-year) period (Because of this time-varying reference, the funds can not be split evenly across the three categories). * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level. Definitions of fund variables are presented in Appendix – Table A1.

	Panel A: LBO Funds					
	Mean	Sd	25th Perc.	Median	75th Perc.	N
DP Y3	0.260	0.173	0.124	0.257	0.386	431
DP Y4	0.148	0.127	0.033	0.127	0.228	431
DP Y5	0.088	0.095	0.000	0.065	0.133	431
DP Y6	0.059	0.078	0.000	0.029	0.097	431
DP Change (Y4-Y6)	0.088	0.10	0.008	0.059	0.146	431
Fund Size (in $million)	2,039.6	2,999.3	418.4	900	2,300	431
Fundraising Y4-Y6	0.548	0.498	0	1	1	431
GP Low Reputation	0.413	0.493	0	0	1	431
TVPI	1.748	0.625	1.365	1.665	2.088	431
KS-PME	1.381	0.734	0.88	1.306	1.763	431
Past TVPI	1.709	0.658	1.213	1.629	2.102	239
Past KS-PME	1.373	0.817	0.858	1.398	2.015	239
Management Fees (in %)	1.812	0.373	2	2	2	159
Carried Interest (in %)	19.924	2.946	20	20	20	195
	Panel B: High vs. Low Dry Powder Y4 LBO Funds					
	High Dry Powder Y4			Low Dry Powder Y4			T-Test
	Mean	Sd	N	Mean	Sd	N	High-Low
DP Y3	0.415	0.133	149	0.115	0.111	147	0.300***
DP Y4	0.287	0.097	149	0.024	0.031	147	0.263***
DP Y5	0.167	0.102	149	0.016	0.029	147	0.154***
DP Y6	0.110	0.099	149	0.013	0.027	147	0.097***
DP Change (Y4-Y6)	0.177	0.111	149	0.012	0.025	147	0.166***
Fund Size (in $million)	1,901.6	3,081.9	149	2,518.4	3,060.5	147	-616.8*
Fundraising Y4-Y6	0.510	0.502	149	0.571	0.497	147	-0.061
GP Low Reputation	0.456	0.500	149	0.347	0.478	147	0.109*
TVPI	1.551	0.504	149	1.936	0.614	147	-0.385***
KS-PME	1.104	0.648	149	1.595	0.724	96	-0.492***
Past TVPI	1.592	0.580	67	1.857	0.756	96	-0.266**
Past KS-PME	1.281	0.79	67	1.453	0.838	96	-0.172*
Management Fees (in %)	1.872	0.368	57	1.750	0.367	46	0.123*
Carried Interest (in %)	19.14	3.83	67	20.43	2.04	70	-1.291**

Table III – Capital Deployment: Summary statistics.
Panel A displays statistics on the year-by-year capital deployment (as a percentage of the committed capital) for the 431 funds. Panel B shows the capital deployment (measured by the dry powder variation from Y4 to Y6) of funds which have accumulated abnormal level of dry powder at Y4 at the end of the investment period. Low DP Variation Y4-Y6 represents funds that have invested from 0% to 10% (included) of dry powder over the period Y4 to Y6. Mid DP Variation Y4-Y6 represents funds that have invested more than 10% and less or equal to 20% (included). High DP Variation Y4-Y6 represents funds that have invested more than 20% of dry powder.

Capital Deployment of Funds								
	Panel A: Capital Deployment Over Fund Life							
	Mean	SD	Minimum	Low Tercile	Median	High tercile	Maximum	N
% of K invested	95%	7%	53%	95%	99%	100%	100%	431
% of K Invested in Y1	38%	19%	2%	28%	35%	43%	76%	431
% of K Invested in Y2	58%	20%	10%	49%	56%	66%	100%	431
% of K Invested in Y3	74%	17%	10%	67%	74%	83%	100%	431
% of K Invested in Y4	85%	13%	31%	81%	87%	92%	100%	431
% of K Invested in Y5	91%	9%	51%	90%	94%	98%	100%	431
% of K Invested in Y6	94%	8%	54%	93%	97%	100%	100%	431
% of K Invested in Y7	95%	7%	54%	95%	97%	100%	100%	431
% of K Invested in Y8	95%	7%	53%	95%	98%	100%	100%	431
% of K Invested in Y9	95%	7%	53%	95%	99%	100%	100%	431
% of K Invested in Y10	95%	7%	53%	95%	99%	100%	100%	431

	Panel B: Capital Deployment for High DP Y4 Funds							
DP Variation Y4-Y6	Mean	SD	Minimum	Low Tercile	Median	High tercile	Maximum	N
All DP Variation Y4-Y6	92%	9%	53%	92%	95%	98%	100%	149
Low DP Variation Y4-Y6	84%	11%	53%	80%	86%	88%	100%	38
Mid DP Variation Y4-Y6	91%	8%	66%	92%	96%	95%	100%	53
High DP Variation Y4-Y6	97%	4%	74%	97%	99%	100%	100%	58

	Panel C: Capital Deployment and Timing			
	All Funds		High DP Y4 Funds	
Capital Deployed	% of Funds	Avg # Year To Deploy K	% of Funds	Avg # Year To Deploy K
=100%	48%	4.64	27%	5.88
>=95%	68%	4.63	48%	5.82
>=90%	84%	4.42	69%	5.73
>=85%	93%	4.04	83%	5.39
>=80%	96%	3.72	87%	5.10
>=75%	97%	3.45	93%	4.62
>=70%	99%	3.17	96%	4.14

Table IV – Duration Model: Time to Drawdown 70% of capital
The table presents the results of a duration model where the error is assumed to follow a Weibull distribution. It reports the variables associated with the time a fund takes to drawdown 70% of its committed capital during the investment period (which we consider up to year 6). The economic variables are defined in Appendix Table A3 and the fund variables in Appendix Table A1. We use vintage years fixed-effects where vintage years are grouped by period of 5 years.* stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Time to Drawdown 70% of Committed Capital			
	(1)	(2)	(3)	(4)
Economic Variables				
High Value-Weighted Mean BM Ratio	0.251**	0.251**	0.252**	0.0914
	(2.12)	(2.12)	(2.13)	(0.82)
High Credit Spread	0.349***	0.349***	0.347***	0.227**
	(2.88)	(2.89)	(2.87)	(2.14)
Competition for Deal Flow				
Log Real Funds Size, same vintage year	0.221***	0.221***	0.215***	0.0509
	(2.90)	(2.91)	(2.83)	(0.71)
DP Industry Concentration	-0.414***	-0.414**	-0.418***	-0.352**
	(-2.58)	(-2.57)	(-2.62)	(-2.53)
Fund Characteristics				
Log GP Age	-0.00193			
	(-0.05)			
Log Real Fund Size	-0.0874***	-0.0880***	-0.0749**	-0.0698***
	(-2.94)	(-3.26)	(-2.52)	(-2.70)
Low Reputation			0.0603	0.0100
			(0.85)	(0.17)
Fundraising				-1.108***
				(-12.59)
Vintage Year Period-F.E	Yes	Yes	Yes	Yes
p	1.032	1.032	1.032	1.153
L Ratio Test	47.6	47.28	48.97	244.16
P-Value	0.000	0.000	0.000	0.000
Number of Funds	431	431	431	431
Number of Funds x Year	1385	1385	1385	1385
Number Failure	425	425	425	425

Table V – Duration Model: Time to Drawdown Times 20% of capital between Y4-Y6
The table presents the results of a duration model where the error is assumed to follow a Weibull distribution. It reports the variables associated with the time a fund takes to drawdown 20% of its committed capital between vintage years +4 and +6 (Y4-Y6) for funds with abnormal dry powder at Y4. The economic variables are defined in Appendix Table A3 and the fund variables in Appendix Table A1. We use vintage years fixed-effects where vintage years are grouped by period of 5 years.* stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	High DP Y4 Funds			
	Time to Drawdown 20% of Committed Capital Between Y4 to Y6			
	(1)	(2)	(3)	(4)
Economic Variables				
High Value-Weighted Mean BM Ratio	-0.0199	-0.0180	-0.0383	-0.0498
	(-0.04)	(-0.03)	(-0.07)	(-0.09)
High Credit Spread	0.790***	0.796***	0.774***	0.782***
	(2.70)	(2.69)	(2.66)	(2.67)
Competition for Deal Flow				
Log Real Funds Size, same vintage year	0.169	0.173	0.161	0.168
	(0.73)	(0.77)	(0.72)	(0.76)
DP Industry Concentration	-0.288	-0.275	-0.282	-0.330
	(-0.67)	(-0.65)	(-0.67)	(-0.79)
Fund Characteristics				
Log GP Age	-0.0183			
	(-0.14)			
Log Real Fund Size	-0.0916	-0.0956	-0.0572	-0.0618
	(-1.19)	(-1.32)	(-0.70)	(-0.74)
Low Reputation			0.208	0.193
			(0.89)	(0.81)
Fundraising				-0.202
				(-0.91)
Vintage Year Period-F.E	Yes	Yes	Yes	Yes
p	1.288	1.289	1.289	1.283
L Ratio Test	20.38	20.37	20.3	21.42
P-Value	0.04	0.026	0.041	0.045
Number of Funds	149	149	149	149
Number of Funds x Year	424	424	424	424
Number Failure	58	58	58	58

Table VI – Fund Performance

This table presents how dry powder utilization at the end of the investment period is associated with the fund performance. The main variable of interest, High DP Y4, is splitted in three level according to the variation of dry powder between vintage year + 4 and + 6. Low DP Variation Y4-Y6 represents funds that have invested from 0% to 10% (included) of dry powder over the period Y4 to Y6. Mid DP Variation Y4-Y6 represents funds that have invested more than 10% and less or equal to 20% (included). High DP Variation Y4-Y6 represents funds that have invested more than 20% of dry powder. The reference category to interpret these results are funds that have display a low level dry powder at vintage year + 4. Dependent variables are the realized TVPI (Total Value to Paid-In capital) (Panel A), and the realized KS-PME (Kaplan Schoar PME) (Panel B). IMR refers to the inverse Mills ratio capturing the non-selection hazard of disclosing information. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Panel A: TVPI				Panel B: KS-PME			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
High DP Y4 x Low DP Var (Y4Y6)	-0.236**	-0.193*	-0.135	-0.138	-0.192	-0.171	-0.103	-0.104
	(0.107)	(0.107)	(0.106)	(0.106)	(0.117)	(0.117)	(0.116)	(0.116)
High DP Y4 x Mid DP Var (Y4Y6)	-0.301***	-0.271***	-0.281***	-0.277***	-0.519***	-0.496***	-0.505***	-0.504***
	(0.0911)	(0.0915)	(0.0901)	(0.0901)	(0.0996)	(0.0999)	(0.0981)	(0.0983)
High DP Y4 x High DP Var (Y4Y6)	-0.374***	-0.351***	-0.350***	-0.348***	-0.605***	-0.605***	-0.605***	-0.604***
	(0.0875)	(0.0868)	(0.0854)	(0.0854)	(0.0956)	(0.0948)	(0.0931)	(0.0932)
Q4 Past Perf.		0.319***	0.277***	0.318***		0.191**	0.126	0.135
		(0.0975)	(0.104)	(0.110)		(0.0834)	(0.0939)	(0.102)
Q3 Past Perf.		0.120	0.133	0.168*		0.160*	0.116	0.127
		(0.0808)	(0.0920)	(0.0969)		(0.0921)	(0.102)	(0.111)
Q2 Past Perf.		0.0536	0.0186	0.0678		-0.179	-0.182	-0.174
		(0.0871)	(0.0933)	(0.103)		(0.124)	(0.124)	(0.129)
Q1 Past Perf.		-0.0618	-0.0339	-0.00903		0.0272	0.00986	0.0145
		(0.106)	(0.109)	(0.111)		(0.129)	(0.132)	(0.134)
Ln Fund Size			0.0122	0.0484			0.0476	0.0558
			(0.0306)	(0.0442)			(0.0335)	(0.0479)
GP Low Reputation			0.0398	0.0449			0.0549	0.0559
			(0.0745)	(0.0746)			(0.0815)	(0.0817)
Fundraising Y4-Y6			0.239***	0.256***			0.267***	0.271***
			(0.0583)	(0.0601)			(0.0629)	(0.0655)
IMR				0.179				0.0409
				(0.157)				(0.171)
Vintage Year-F.E	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	431	431	431	431	431	431	431	431
Adjusted R^2	0.123	0.143	0.173	0.173	0.242	0.257	0.287	0.285

Table VII – LBO deals: Summary statistics.
This table displays summary statistics on a sample of deals performed between 1986 and 2019 by 431 US funds. Panel A displays descriptive statistics of all LBO deals and Panel B only considers deals completed at and after vintage year + 4 according to the level of dry powder of their funds. All deal variables are winsorized at the 1% level, except deal club. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level. Definitions of deal variables are presented in Appendix – Table A2.

	Panel A: All Deals				
	Mean	Sd	25th perc	75th perc	N
Deal Characteristics					
Deal Size (in $million)	821.018	1,1315.5	100	900	2,379
Deal Club	1.688	1.195	1	2	2,379
Investment Duration	4.884	2.403	2	7	1,797
Target Revenues (in $million)	1,019.4	1,411.6	180	1,200	986
Cash Return	2.129	2.276	0.498	2.615	966
IRR (in %)	9.932	32.653	-2.493	26.276	966
Leverage	0.597	0.209	0.445	0.738	639
EBITDA Margin	0.164	0.097	0.083	0.234	622
EV/EBITDA Multiple	10.305	4.979	7.143	12.96	622
Fund Characteristics					
Fund Size (in $million)	3,811.1	4,818.5	750	4,700	2,379
Fundraising	0.287	0.452	0	1	2,379
GP Low Reputation	0.348	0.476	0	1	2,379
Carried Interest (in %)	20.3	2.480	20	20	1,133
Management fees (in %)	1.79	0.336	1.5	2	978

	Panel B: Late Deals						
	High Dry Powder			Low Dry Powder			T-test
	Mean	Sd	N	Mean	Sd	N	High-Low
Deal Characteristics							
Deal Size (in $million)	519.1	808.8	192	914.1	1,338.6	185	-394.9**
Deal Club	1.526	1.193	192	1.789	1.172	185	-0.263**
Investment Duration	4.831	2.259	159	4.320	2.203	159	0.510*
Target Revenues (in $million)	780.93	1,154.56	85	906.30	1,209.19	89	-125.37
Cash Return	1.870	2.178	82	2.178	2.246	87	-0.308
IRR (in %)	6.87	26.70	82	13.13	35.77	87	-6.27
Leverage	0.538	0.196	55	0.619	0.203	55	-0.081**
EBITDA Margin	0.181	0.097	49	0.183	0.124	51	0.06
EV/EBITDA Multiple	11.277	4.615	49	10.392	5.416	51	0.463
Fund Characteristics							
Fund Size (in $million)	2,890.8	3,780.9	192	4,927.5	5,107.4	185	-2,036.668***
Fundraising	0.365	0.483	192	0.432	0.497	185	-0.068**
GP Low Reputation	0.370	0.484	192	0.276	0.448	185	0.094*
Carried Interest (in %)	20.947	3.175	75	20.414	2.021	87	0.532
Management fees (in %)	1.845	0.247	55	1.730	0.289	63	0.115*

Table VIII – Deal analysis: Leverage

This table displays the results related to Equation 1 when leverage is the dependent variable. The abnormal dry powder (DP) is a dummy variable equal to one if the dry powder one quarter before the deal is above or equal to the top tercile dry powder of the peer funds. "Late Deal" is a dummy variable taking the value of one if the deal investment year is superior or equal to vintage year + 4. Standard errors are clustered according to investment year and are reported in parentheses. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Abnormal DP	0.0248	0.0189	0.0110	0.0106	0.00912	0.00912	0.00905	0.00927
	(0.0223)	(0.0189)	(0.0184)	(0.0188)	(0.0192)	(0.0192)	(0.0193)	(0.0190)
Late Deal	0.0123	0.0116	0.0102	0.00992	0.0117	0.0117	0.0116	0.0119
	(0.0299)	(0.0285)	(0.0276)	(0.0278)	(0.0272)	(0.0272)	(0.0272)	(0.0272)
Abnormal DP × Late Deal	-0.0975**	-0.0926***	-0.0820**	-0.0815**	-0.0812**	-0.0812**	-0.0812**	-0.0821**
	(0.0384)	(0.0312)	(0.0314)	(0.0318)	(0.0315)	(0.0315)	(0.0315)	(0.0304)
Ln Deal Size	-0.0449***	-0.0515***	-0.0496***	-0.0497***	-0.0496***	-0.0496***	-0.0496***	-0.0493***
	(0.00963)	(0.00978)	(0.00937)	(0.00917)	(0.00932)	(0.00932)	(0.00934)	(0.00994)
Ln Fund Size	0.000887	0.00750	0.00747	0.00656	0.00609	0.00609	0.00603	0.00627
	(0.00916)	(0.00799)	(0.00850)	(0.0107)	(0.0110)	(0.0110)	(0.0112)	(0.0108)
GP Low Reputation				-0.00595	-0.00607	-0.00607	-0.00609	-0.00518
				(0.0337)	(0.0341)	(0.0341)	(0.0341)	(0.0322)
Fundraising					-0.00826	-0.00826	-0.00830	-0.00862
					(0.0150)	(0.0150)	(0.0153)	(0.0159)
Market BM Ratio						-0.00326	-0.00320	-0.00375
						(0.00361)	(0.00381)	(0.00457)
DP Industry Concentration							-0.00215	-0.00159
							(0.0446)	(0.0443)
Credit Spread								0.00571
								(0.0248)
Year-F.E	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-F.E	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	639	639	639	639	639	639	639	639
Adjusted R^2	0.074	0.136	0.158	0.157	0.156	0.156	0.154	0.153

Table IX – Deal analysis: EBITDA Multiple

This table displays the results related to Equation 1 when EV/EBITDA multiple is the dependent variable. The abnormal dry powder (DP) is a dummy variable equal to one if the dry powder one quarter before the deal is above or equal to the top tercile dry powder of the peer funds. "Late Deal" is a dummy variable taking the value of one if the deal investment year is superior or equal to vintage year + 4. Standard errors are clustered according to investment year and are reported in parentheses. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Abnormal DP	-0.969**	-0.893**	-0.847**	-0.865**	-0.902**	-0.902**	-0.900**	-0.901**
	(0.416)	(0.424)	(0.392)	(0.392)	(0.403)	(0.403)	(0.404)	(0.406)
Late Deal	-1.132	-0.207	0.0117	-0.00007	0.0123	0.0123	0.0172	0.00781
	(1.057)	(0.751)	(0.637)	(0.647)	(0.655)	(0.655)	(0.660)	(0.666)
Abnormal DP × Late Deal	2.715***	1.965**	1.779**	1.815**	1.882**	1.882**	1.887**	1.902**
	(0.885)	(0.860)	(0.698)	(0.723)	(0.776)	(0.776)	(0.781)	(0.797)
Ln Deal Size	1.445***	1.330***	1.247***	1.241***	1.247***	1.247***	1.243***	1.241***
	(0.164)	(0.123)	(0.127)	(0.123)	(0.124)	(0.124)	(0.124)	(0.123)
Ln Fund Size	-0.475**	-0.908***	-0.651***	-0.706***	-0.719***	-0.719***	-0.697***	-0.696***
	(0.228)	(0.169)	(0.176)	(0.137)	(0.135)	(0.135)	(0.133)	(0.133)
GP Low Reputation				-0.363	-0.350	-0.350	-0.327	-0.338
				(0.436)	(0.434)	(0.434)	(0.426)	(0.420)
Fundraising					-0.319	-0.319	-0.317	-0.313
					(0.396)	(0.396)	(0.399)	(0.397)
Market BM Ratio						-2.348***	-2.376***	-2.389***
						(0.193)	(0.209)	(0.202)
DP Industry Concentration							0.585	0.587
							(0.856)	(0.852)
Credit Spread								-0.0782
								(0.411)
Year-F.E	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-F.E	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	622	622	622	622	622	622	622	622
Adjusted R^2	0.153	0.243	0.304	0.304	0.303	0.303	0.302	0.301

Table X – Deal analysis: Cash Return

This table displays the results related to Equation 1 when the cash return is the dependent variable. The abnormal dry powder (DP) is a dummy variable equal to one if the dry powder one quarter before the deal is above or equal to the top tercile dry powder of the peer funds. "Late Deal" is a dummy variable taking the value of one if the deal investment year is superior or equal to vintage year + 4. Standard errors are clustered according to investment year and are reported in parentheses. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Abnormal DP	0.164	0.182	0.238	0.235	0.224	0.224	0.212	0.213
	(0.144)	(0.150)	(0.158)	(0.161)	(0.167)	(0.167)	(0.170)	(0.170)
Late Deal	0.182	0.258*	0.250	0.261	0.268*	0.268*	0.269*	0.270*
	(0.128)	(0.151)	(0.151)	(0.155)	(0.155)	(0.155)	(0.156)	(0.155)
Abnormal DP × Late Deal	-0.683**	-0.739**	-0.786**	-0.793**	-0.780**	-0.780**	-0.745**	-0.743**
	(0.297)	(0.307)	(0.319)	(0.320)	(0.325)	(0.325)	(0.326)	(0.329)
Ln Deal Size	-0.872***	-0.873***	-0.873***	-0.882***	-0.881***	-0.881***	-0.883***	-0.886***
	(0.0719)	(0.0783)	(0.0780)	(0.0766)	(0.0765)	(0.0765)	(0.0764)	(0.0773)
Ln Fund Size	0.274***	0.257***	0.246***	0.215**	0.211**	0.211**	0.230**	0.229**
	(0.0761)	(0.0809)	(0.0776)	(0.0879)	(0.0877)	(0.0877)	(0.0884)	(0.0874)
GP Low Reputation				-0.201	-0.203	-0.203	-0.196	-0.200
				(0.134)	(0.132)	(0.132)	(0.132)	(0.131)
Fundraising					-0.0746	-0.0746	-0.0933	-0.0955
					(0.123)	(0.123)	(0.126)	(0.126)
Market BM Ratio						-0.0655***	-0.0970***	-0.0965***
						(0.0174)	(0.0276)	(0.0274)
DP Industry Concentration							0.678*	0.678*
							(0.364)	(0.365)
Credit Spread								-0.108
								(0.0836)
Year-F.E	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-F.E	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	966	966	966	966	966	966	966	966
Adjusted R^2	0.264	0.269	0.276	0.276	0.276	0.276	0.278	0.278

Table XI – Deal analysis: Internal Rate of Return

This table displays the results related to Equation 1 when the IRR is the dependent variable. The abnormal dry powder (DP) is a dummy variable equal to one if the dry powder one quarter before the deal is above or equal to the top tercile dry powder of the peer funds. "Late Deal" is a dummy variable taking the value of one if the deal investment year is superior or equal to vintage year + 4. Standard errors are clustered according to investment year and are reported in parentheses. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Abnormal DP	0.0254	0.0179	0.0234	0.0229	0.0204	0.0204	0.0195	0.0201
	(0.0190)	(0.0195)	(0.0182)	(0.0184)	(0.0201)	(0.0201)	(0.0206)	(0.0207)
Late Deal	0.0582**	0.0459*	0.0438	0.0460	0.0478*	0.0478*	0.0476*	0.0483*
	(0.0226)	(0.0235)	(0.0274)	(0.0275)	(0.0272)	(0.0272)	(0.0275)	(0.0274)
Abnormal DP × Late Deal	-0.119**	-0.122**	-0.133***	-0.133***	-0.130***	-0.130***	-0.127***	-0.128***
	(0.0452)	(0.0447)	(0.0437)	(0.0428)	(0.0434)	(0.0434)	(0.0439)	(0.0437)
Ln Deal Size	-0.101***	-0.103***	-0.104***	-0.107***	-0.107***	-0.107***	-0.107***	-0.107***
	(0.00883)	(0.00884)	(0.00887)	(0.00894)	(0.00892)	(0.00892)	(0.00887)	(0.00906)
Ln Fund Size	0.0151	0.00949	0.00826	-0.000479	-0.00132	-0.00132	-0.0000153	-0.000193
	(0.00969)	(0.00901)	(0.00899)	(0.00971)	(0.00998)	(0.00998)	(0.00999)	(0.00989)
GP Low Reputation				-0.0567**	-0.0574**	-0.0574**	-0.0569**	-0.0574**
				(0.0245)	(0.0244)	(0.0244)	(0.0243)	(0.0240)
Fundraising					-0.0184	-0.0184	-0.0197	-0.0199
					(0.0216)	(0.0216)	(0.0223)	(0.0222)
Market BM Ratio						-0.0148***	-0.0170***	-0.0170***
						(0.00324)	(0.00432)	(0.00431)
DP Industry Concentration							0.0473	0.0473
							(0.0449)	(0.0449)
Credit Spread								-0.0138
								(0.0146)
Year-F.E	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-F.E	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	966	966	966	966	966	966	966	966
Adjusted R^2	0.192	0.207	0.218	0.223	0.222	0.222	0.222	0.222

Table XII – Deal analysis: Level of dry powder and deal terms
This table displays the results related to Equation 1 when the dry powder is expressed in level. "Late Deal" is a dummy variable taking the value of one if the deal investment year is superior or equal to vintage year + 4. Coefficients are unstandardized and represents the change in the deal characteristics for one unit change in dry powder (expressed in percentage of the fund committed capital). Standard errors are clustered according to investment year and are reported in parentheses. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Leverage	EBITDA Mult.	Cash Return	IRR
DP	0.0434	-0.930	0.562**	0.0604
	(0.0337)	(1.045)	(0.273)	(0.0395)
Late Deal	0.0632**	-0.805	0.816***	0.120**
	(0.0266)	(0.777)	(0.214)	(0.0440)
DP × Late Deal	-0.278***	5.600**	-2.048***	-0.342***
	(0.0502)	(2.057)	(0.577)	(0.0883)
Ln Deal Size	-0.0484***	1.254***	-0.885***	-0.108***
	(0.00990)	(0.125)	(0.0782)	(0.00917)
Ln Fund Size	0.00658	-0.708***	0.224**	-0.000212
	(0.0106)	(0.147)	(0.0858)	(0.0102)
GP Low Reputation	-0.00398	-0.291	-0.183	-0.0566**
	(0.0325)	(0.420)	(0.125)	(0.0241)
Fundraising	-0.00660	-0.368	-0.0631	-0.0158
	(0.0160)	(0.374)	(0.116)	(0.0202)
Market BM Ratio	-0.00390	-2.256***	-0.0947***	-0.0175***
	(0.00451)	(0.173)	(0.0272)	(0.00385)
DP Industry Concentration	-0.00375	0.531	0.653*	0.0463
	(0.0449)	(0.888)	(0.361)	(0.0449)
Credit Spread	0.00492	-0.124	-0.104	-0.0109
	(0.0247)	(0.449)	(0.0816)	(0.0152)
Year-F.E	Yes	Yes	Yes	Yes
Industry-F.E	Yes	Yes	Yes	Yes
Number of Observations	639	622	966	966
Adjusted R^2	0.157	0.302	0.281	0.227

Table XIII – Deal analysis: Capital deployment decisions and deal selection
This table displays the results related to Equation 1 for the main deal terms (leverage, EV/EBITDA multiple, cash return and IRR) when considering three levels of deployment of dry powder over the period Y4 and Y6: Low (Mid) DP Var stands for a deployment of dry powder inferior to 10% (20%) and High DP var to deployment above 20%. Panel A presents the results when the coefficient of interest is splitted into the three categories, Panel B considers the incremental effects with regard to the reference category of deploying less than 20% (Low and Mid DP Var funds).* stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Panel A			
	Leverage	EBITDA Mult.	Cash Return	IRR
Abnormal DP	0.00881	-0.893**	0.234*	0.0196
	(0.0190)	(0.413)	(0.137)	(0.0208)
Late Deal	0.0110	0.0128	0.318*	0.0485*
	(0.0273)	(0.671)	(0.165)	(0.0270)
Abnormal DP × Late Deal× Low DP Var Y4-Y6	-0.0454	1.776	0.0714	0.00218
	(0.0879)	(1.133)	(0.528)	(0.0769)
Abnormal DP × Late Deal× Mid DP Var Y4-Y6	0.00336	1.364	-0.637*	-0.147***
	(0.0625)	(1.422)	(0.347)	(0.0435)
Abnormal DP × Late Deal× High DP Var Y4-Y6	-0.126***	2.138**	-1.077***	-0.158***
	(0.0427)	(0.998)	(0.361)	(0.0452)
Ln Deal Size	-0.0481***	1.240***	-0.887***	-0.107***
	(0.00985)	(0.124)	(0.0768)	(0.00882)
Ln Fund Size	0.00706	-0.692***	0.222**	-0.000340
	(0.0108)	(0.138)	(0.0883)	(0.00990)
GP Low Reputation	-0.00231	-0.334	-0.190	-0.0566**
	(0.0315)	(0.422)	(0.132)	(0.0240)
Fundraising	-0.0107	-0.271	-0.119	-0.0242
	(0.0157)	(0.440)	(0.127)	(0.0224)
Market BM Ratio	-0.00361	-2.387***	-0.0885***	-0.0169***
	(0.00464)	(0.201)	(0.0276)	(0.00427)
DP Industry Concentration	0.000571	0.578	0.658*	0.0462
	(0.0450)	(0.859)	(0.360)	(0.0450)
Credit Spread	0.00596	-0.0875	-0.126	-0.0149
	(0.0245)	(0.416)	(0.0831)	(0.0146)
Year-F.E	Yes	Yes	Yes	Yes
Industry-F.E	Yes	Yes	Yes	Yes
Number of Observations	639	622	966	966
Adjusted R^2	0.156	0.299	0.280	0.224

	Panel B			
	Leverage	EBITDA Mult.	Cash Return	IRR
Abnormal DP	0.00874	-0.894**	0.236*	0.0199
	(0.0190)	(0.412)	(0.137)	(0.0207)
Late Deal	0.0108	0.0207	0.313*	0.0473*
	(0.0272)	(0.677)	(0.165)	(0.0272)
Abnormal DP × Late Deal	-0.0145	1.626	-0.262	-0.0679
	(0.0442)	(1.077)	(0.378)	(0.0543)
Abnormal DP × Late Deal× High DP Var Y4-Y6	-0.112*	0.512	-0.819*	-0.0910*
	(0.0614)	(1.319)	(0.453)	(0.0473)
Ln Deal Size	-0.0484***	1.242***	-0.889***	-0.108***
	(0.00986)	(0.123)	(0.0772)	(0.00898)
Ln Fund Size	0.00720	-0.696***	0.223**	-0.000113
	(0.0106)	(0.134)	(0.0883)	(0.00992)
GP Low Reputation	-0.00315	-0.340	-0.195	-0.0575**
	(0.0315)	(0.421)	(0.131)	(0.0241)
Fundraising	-0.0105	-0.290	-0.106	-0.0214
	(0.0158)	(0.431)	(0.125)	(0.0221)
Market BM Ratio	-0.00347	-2.388***	-0.0894***	-0.0171***
	(0.00455)	(0.201)	(0.0275)	(0.00424)
DP Industry Concentration	0.0000339	0.589	0.661*	0.0468
	(0.0445)	(0.859)	(0.359)	(0.0447)
Credit Spread	0.00538	-0.0873	-0.120	-0.0137
	(0.0247)	(0.416)	(0.0817)	(0.0144)
Year-F.E	Yes	Yes	Yes	Yes
Industry-F.E	Yes	Yes	Yes	Yes
Number of Observations	639	622	966	966
Adjusted R^2	0.157	0.300	0.280	0.223

Table XIV – Deal analysis: Fees
This table displays the results related to Equation 1 when the variable of Abnormal DP x Late deal is splitted according to the level of management fees of the fund (Panel A) or the fee computation basis (Panel B). * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Panel A			
	Leverage	EBITDA Mult.	Cash Return	IRR
Abnormal DP	0.0119	-1.637**	-0.217	0.0159
	(0.0366)	(0.686)	(0.332)	(0.0469)
Late Deal	0.0125	0.101	0.462	0.0643
	(0.0380)	(1.291)	(0.301)	(0.0477)
Abnormal DP × Late Deal × High MF	-0.167**	4.830**	-1.001	-0.240***
	(0.0605)	(2.207)	(0.768)	(0.0759)
Abnormal DP × Late Deal × Low MF	-0.0499	1.468	0.425	0.0286
	(0.0564)	(1.769)	(0.794)	(0.121)
Ln Deal Size	-0.0375*	1.484***	-0.849***	-0.124***
	(0.0209)	(0.176)	(0.152)	(0.0171)
Ln Fund Size	-0.00467	-0.488*	0.182	0.0228
	(0.0182)	(0.249)	(0.129)	(0.0201)
GP Low Reputation	0.0343	-0.447	-0.210	-0.0196
	(0.0348)	(0.752)	(0.345)	(0.0515)
Fundraising	-0.0218	-0.793	0.272	0.0489
	(0.0456)	(1.076)	(0.291)	(0.0375)
Market BM Ratio	0.0190**	-0.707***	-0.633***	-0.0640***
	(0.00836)	(0.189)	(0.116)	(0.0140)
DP Industry Concentration	-0.0732	-0.199	0.991	0.121
	(0.0523)	(1.129)	(0.640)	(0.0865)
Credit Spread	0.0315	0.0654	-0.121	-0.0454**
	(0.0329)	(0.596)	(0.264)	(0.0212)
Year-F.E	Yes	Yes	Yes	Yes
Industry-F.E	Yes	Yes	Yes	Yes
Number of Observations	261	239	338	338
Adjusted R^2	0.093	0.351	0.263	0.272

	Panel B			
	Leverage	EBITDA Mult.	Cash Return	IRR
Abnormal DP	0.0223	-1.018	-0.262	-0.0348
	(0.0546)	(1.259)	(0.331)	(0.0481)
Late Deal	-0.00804	0.0490	0.664**	0.0131
	(0.0533)	(1.714)	(0.310)	(0.0523)
Abnormal DP × Late Deal × Switch	-0.147*	5.134**	-1.494**	-0.162*
	(0.0709)	(2.206)	(0.572)	(0.0936)
Abnormal DP × Late Deal × No Switch	-0.117	3.813	-0.455	-0.0347
	(0.0940)	(3.023)	(1.234)	(0.176)
Ln Deal Size	-0.0525***	1.057***	-1.020***	-0.147***
	(0.0175)	(0.302)	(0.127)	(0.0137)
Ln Fund Size	0.00633	-0.732**	0.129	0.0172
	(0.0135)	(0.347)	(0.137)	(0.0208)
GP Low Reputation	-0.0228	-2.023	-0.0229	-0.0269
	(0.0439)	(1.602)	(0.413)	(0.0612)
Fundraising	0.0193	-0.308	0.284	0.0182
	(0.0406)	(1.315)	(0.313)	(0.0548)
Market BM Ratio	0.131***	0.748	-0.803***	-0.0857***
	(0.0217)	(0.609)	(0.163)	(0.0231)
DP Industry Concentration	-0.0173	0.393	0.644	0.0725
	(0.0658)	(1.354)	(0.615)	(0.0877)
Credit Spread	0.00611	-1.128	-0.268**	-0.0535**
	(0.0319)	(0.694)	(0.111)	(0.0233)
Year-F.E	Yes	Yes	Yes	Yes
Industry-F.E	Yes	Yes	Yes	Yes
Number of Observations	180	167	238	238
Adjusted R^2	0.153	0.351	0.441	0.345

Table XV – Robustness test: Deal selection – Leverage
This table - Panel A replicates Table VIII considering other fixed-effects or in the PBO subsample. Panel B repeats the same analysis considering capital deployment between Y4 and Y6 instead of the abnormal dry powder level. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Panel A			
Abnormal DP	0.00927	0.0102	0.0372	0.0176
	(0.0190)	(0.0229)	(0.0231)	(0.0270)
Late Deals	0.0119	0.00892	-0.0137	0.00151
	(0.0272)	(0.0277)	(0.0347)	(0.0327)
Abnormal DP x Late Deals	-0.0821**	-0.0954**	-0.100**	-0.0882**
	(0.0304)	(0.0418)	(0.0385)	(0.0384)
Ln Deal Size	-0.0493***	-0.0419***	-0.0454***	-0.0508***
	(0.00994)	(0.0132)	(0.0106)	(0.0116)
Ln Fund Size	0.00627	0.000823	0.00840	0.00576
	(0.0108)	(0.0167)	(0.0111)	(0.00969)
GP Low Reputation	-0.00518	0.0161	0.0108	-0.000146
	(0.0322)	(0.0346)	(0.0347)	(0.0313)
Fundraising	-0.00862	0.00375	-0.00212	-0.00319
	(0.0159)	(0.0202)	(0.0208)	(0.0189)
Market BM Ratio	-0.00375	-0.00647	-0.000852	-0.122***
	(0.00457)	(0.0102)	(0.00571)	(0.0306)
DP Industry Concentration	-0.00159	0.0390	-0.0203	-0.0465
	(0.0443)	(0.0909)	(0.0471)	(0.0305)
Credit Spread	0.00571	0.0149	0.00513	-0.0150
	(0.0248)	(0.0158)	(0.0355)	(0.0315)
Year-F.E	Yes	Yes	Yes	No
Industry-F.E	Yes	Yes	Yes	No
GP F-E	No	Yes	No	No
PBO Only	No	No	Yes	No
Time x Industry F-E	No	No	No	Yes
Number of Observations	639	639	498	639
Adjusted R^2	0.153	0.224	0.195	0.258

	Panel B			
Abnormal DP	0.00881	0.00964	0.0373	0.0173
	(0.0190)	(0.0226)	(0.0229)	(0.0271)
Late Deals	0.0110	0.00918	-0.0139	0.00102
	(0.0273)	(0.0279)	(0.0349)	(0.0321)
Abnormal DP × Late Deal × Low DP Var Y4-Y6	-0.0454	-0.142	-0.161**	-0.113
	(0.0879)	(0.113)	(0.0678)	(0.107)
Abnormal DP × Late Deal × Mid DP Var Y4-Y6	0.00336	-0.0192	0.0169	-0.0188
	(0.0625)	(0.0686)	(0.0679)	(0.0848)
Abnormal DP × Late Deal × High DP Var Y4-Y6	-0.126***	-0.116**	-0.138***	-0.112**
	(0.0427)	(0.0517)	(0.0439)	(0.0414)
Ln Deal Size	-0.0481***	-0.0412***	-0.0430***	-0.0498***
	(0.00985)	(0.0131)	(0.0104)	(0.0118)
Ln Fund Size	0.00706	0.000337	0.00827	0.00599
	(0.0108)	(0.0163)	(0.0110)	(0.00979)
GP Low Reputation	-0.00231	0.0167	0.0156	0.00241
	(0.0315)	(0.0340)	(0.0339)	(0.0311)
Fundraising	-0.0107	0.00277	-0.00623	-0.00536
	(0.0157)	(0.0209)	(0.0216)	(0.0192)
Market BM Ratio	-0.00361	-0.00590	-0.000901	-0.125***
	(0.00464)	(0.0108)	(0.00570)	(0.0298)
DP Industry Concentration	0.000571	0.0377	-0.0158	-0.0432
	(0.0450)	(0.0923)	(0.0471)	(0.0314)
Credit Spread	0.00596	0.0149	0.00613	-0.0132
	(0.0245)	(0.0167)	(0.0351)	(0.0313)
Year-F.E	Yes	Yes	Yes	No
Industry-F.E	Yes	Yes	Yes	No
GP F-E	No	Yes	No	No
PBO Only	No	No	Yes	No
Time x Industry F-E	No	No	No	Yes
Number of Observations	639	639	498	639
Adjusted R^2	0.156	0.223	0.202	0.258

Table XVI – Robustness test: Deal selection – EBITDA Multiple
Panel A replicates Table IX considering other fixed-effects and the PBO subsample. Panel B repeats the same analysis considering capital deployment between Y4 and Y6 instead of the abnormal dry powder level. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Panel A			
Abnormal DP	-0.901**	-0.895*	-0.869*	-0.898*
	(0.406)	(0.451)	(0.460)	(0.481)
Late Deals	0.00781	-0.839	-0.461	-0.199
	(0.666)	(0.769)	(0.752)	(0.596)
Abnormal DP x Late Deals	1.902**	2.033**	2.237**	2.079**
	(0.797)	(0.811)	(0.920)	(0.959)
Ln Deal Size	1.241***	1.215***	1.200***	1.256***
	(0.123)	(0.143)	(0.127)	(0.158)
Ln Fund Size	-0.696***	-0.182	-0.723***	-0.672***
	(0.133)	(0.532)	(0.129)	(0.163)
GP Low Reputation	-0.338	0.460	-0.197	-0.445
	(0.420)	(1.102)	(0.492)	(0.489)
Fundraising	-0.313	0.0558	-0.226	-0.553
	(0.397)	(0.586)	(0.442)	(0.493)
Market BM Ratio	-2.389***	-2.393***	-2.411***	0.899***
	(0.202)	(0.761)	(0.220)	(0.118)
DP Industry Concentration	0.587	1.969*	0.201	0.244
	(0.852)	(0.973)	(1.300)	(1.079)
Credit Spread	-0.0782	-0.318	-0.132	0.0307
	(0.411)	(0.549)	(0.414)	(0.587)
Year-F.E	Yes	Yes	Yes	No
Industry-F.E	Yes	Yes	Yes	No
GP F-E	No	Yes	No	No
PBO Only	No	No	Yes	No
Time x Industry F-E	Yes	Yes	Yes	Yes
Number of Observations	622	622	518	622
Adjusted R^2	0.301	0.389	0.307	0.400

	Panel B			
Abnormal DP	-0.893**	-0.905*	-0.864*	-0.887*
	(0.413)	(0.465)	(0.463)	(0.490)
Late Deals	0.0128	-0.859	-0.468	-0.131
	(0.671)	(0.766)	(0.778)	(0.628)
Abnormal DP × Late Deal × Low DP Var Y4-Y6	1.776	2.304*	2.298	1.014
	(1.133)	(1.201)	(1.514)	(1.105)
Abnormal DP × Late Deal × Mid DP Var Y4-Y6	1.364	1.935	1.475	1.997
	(1.422)	(2.255)	(1.520)	(1.659)
Abnormal DP × Late Deal × High DP Var Y4-Y6	2.138**	1.909*	2.458**	2.612*
	(0.998)	(0.970)	(1.056)	(1.347)
Ln Deal Size	1.240***	1.211***	1.198***	1.274***
	(0.124)	(0.140)	(0.130)	(0.155)
Ln Fund Size	-0.692***	-0.167	-0.711***	-0.696***
	(0.138)	(0.536)	(0.136)	(0.171)
GP Low Reputation	-0.334	0.476	-0.180	-0.464
	(0.422)	(1.103)	(0.496)	(0.500)
Fundraising	-0.271	0.0628	-0.165	-0.536
	(0.440)	(0.656)	(0.490)	(0.579)
Market BM Ratio	-2.387***	-2.389***	-2.407***	0.901***
	(0.201)	(0.773)	(0.218)	(0.121)
DP Industry Concentration	0.578	1.954*	0.180	0.289
	(0.859)	(1.038)	(1.307)	(1.072)
Credit Spread	-0.0875	-0.314	-0.144	-0.0326
	(0.416)	(0.545)	(0.420)	(0.600)
Year-F.E	Yes	Yes	Yes	No
Industry-F.E	Yes	Yes	Yes	No
GP F-E	No	Yes	No	No
PBO Only	No	No	Yes	No
Time x Industry F-E	No	No	No	Yes
Number of Observations	622	622	518	622
Adjusted R^2	0.299	0.386	0.304	0.399

Table XVII – Robustness test: Deal selection – Cash Return
Panel A replicates Table X considering other fixed-effects and the PBO subsample. Panel B repeats the same analysis considering capital deployment between Y4 and Y6 instead of the abnormal dry powder level. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Panel A			
Abnormal DP	0.238*	0.146	0.139	0.379**
	(0.137)	(0.152)	(0.155)	(0.184)
Late Deals	0.321*	0.376	0.381*	0.303
	(0.165)	(0.232)	(0.186)	(0.219)
Abnormal DP x Late Deals	-0.805**	-0.755**	-0.745**	-0.822**
	(0.315)	(0.358)	(0.327)	(0.381)
Ln Deal Size	-0.883***	-0.925***	-0.873***	-0.928***
	(0.0770)	(0.0857)	(0.0928)	(0.0970)
Ln Fund Size	0.222**	0.150	0.229**	0.261**
	(0.0886)	(0.141)	(0.0901)	(0.0982)
GP Low Reputation	-0.194	-0.443	-0.205	-0.128
	(0.131)	(0.276)	(0.141)	(0.188)
Fundraising	-0.0923	-0.366**	-0.156	-0.0285
	(0.124)	(0.154)	(0.119)	(0.144)
Market BM Ratio	-0.0881***	-0.0927	-0.0861***	-1.419***
	(0.0275)	(0.0614)	(0.0296)	(0.234)
DP Industry Concentration	0.665*	0.596	0.619	0.728
	(0.361)	(0.504)	(0.403)	(0.442)
Credit Spread	-0.122	-0.0965	-0.0917	-0.0451
	(0.0825)	(0.102)	(0.0833)	(0.130)
Year-F.E	Yes	Yes	Yes	No
Industry-F.E	Yes	Yes	Yes	No
GP F-E	No	Yes	No	No
PBO Only	No	No	Yes	No
Time x Industry F-E	Yes	Yes	Yes	Yes
Number of Observations	966	966	773	966
Adjusted R^2	0.278	0.321	0.266	0.362

	Panel B			
Abnormal DP	0.234*	0.135	0.137	0.373*
	(0.137)	(0.153)	(0.155)	(0.185)
Late Deals	0.318*	0.370	0.380*	0.310
	(0.165)	(0.233)	(0.186)	(0.218)
Abnormal DP × Late Deal × Low DP Var Y4-Y6	0.0714	-0.110	0.274	0.0320
	(0.528)	(0.673)	(0.556)	(0.612)
Abnormal DP × Late Deal × Mid DP Var Y4-Y6	-0.637*	-0.669	-0.786*	-0.473
	(0.347)	(0.536)	(0.461)	(0.347)
Abnormal DP × Late Deal × High DP Var Y4-Y6	-1.077***	-0.941**	-1.059**	-1.155**
	(0.361)	(0.430)	(0.395)	(0.430)
Ln Deal Size	-0.887***	-0.927***	-0.876***	-0.933***
	(0.0768)	(0.0853)	(0.0931)	(0.0974)
Ln Fund Size	0.222**	0.147	0.224**	0.258**
	(0.0883)	(0.138)	(0.0898)	(0.0974)
GP Low Reputation	-0.190	-0.442	-0.205	-0.131
	(0.132)	(0.282)	(0.139)	(0.188)
Fundraising	-0.119	-0.397**	-0.190	-0.0544
	(0.127)	(0.164)	(0.119)	(0.142)
Market BM Ratio	-0.0885***	-0.0802	-0.0855***	-1.429***
	(0.0276)	(0.0613)	(0.0295)	(0.236)
DP Industry Concentration	0.658*	0.643	0.607	0.700
	(0.360)	(0.509)	(0.403)	(0.426)
Credit Spread	-0.126	-0.0981	-0.103	-0.0370
	(0.0831)	(0.104)	(0.0845)	(0.130)
Year-F.E	Yes	Yes	Yes	No
Industry-F.E	Yes	Yes	Yes	No
GP F-E	No	Yes	No	No
PBO Only	No	No	Yes	No
Time x Industry F-E	No	No	No	Yes
Number of Observations	966	966	773	966
Adjusted R^2	0.280	0.320	0.269	0.364

Table XVIII – Robustness test: Deal selection – IRR
Panel A replicates Table X considering other fixed-effects and the PBO subsample. Panel B repeats the same analysis considering capital deployment between Y4 and Y6 instead of the abnormal dry powder level. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Panel A			
Abnormal DP	0.0201	0.0227	0.00532	0.0371
	(0.0207)	(0.0276)	(0.0213)	(0.0259)
Late Deals	0.0483*	0.0381	0.0395	0.0540**
	(0.0274)	(0.0390)	(0.0265)	(0.0262)
Abnormal DP x Late Deals	-0.128***	-0.134*	-0.108**	-0.136**
	(0.0437)	(0.0723)	(0.0429)	(0.0539)
Ln Deal Size	-0.107***	-0.113***	-0.103***	-0.112***
	(0.00906)	(0.00972)	(0.00916)	(0.00982)
Ln Fund Size	-0.000193	-0.0248	-0.000687	0.00939
	(0.00989)	(0.0237)	(0.0109)	(0.00888)
GP Low Reputation	-0.0574**	-0.0110	-0.0506*	-0.0475*
	(0.0240)	(0.0439)	(0.0256)	(0.0249)
Fundraising	-0.0199	-0.0465	-0.0333	-0.0288
	(0.0222)	(0.0279)	(0.0218)	(0.0216)
Market BM Ratio	-0.0170***	-0.0187**	-0.0183***	0.138***
	(0.00431)	(0.00866)	(0.00457)	(0.0179)
DP Industry Concentration	0.0473	-0.0402	0.0858	0.0902*
	(0.0449)	(0.0621)	(0.0541)	(0.0505)
Credit Spread	-0.0138	-0.0144	-0.0138	-0.00317
	(0.0146)	(0.0215)	(0.0130)	(0.0204)
Year-F.E	Yes	Yes	Yes	No
Industry-F.E	Yes	Yes	Yes	No
GP F-E	No	Yes	No	No
PBO Only	No	No	Yes	No
Time x Industry F-E	Yes	Yes	Yes	Yes
Number of Observations	966	966	773	966
Adjusted R^2	0.222	0.257	0.239	0.288

	Panel B			
Abnormal DP	0.0196	0.0210	0.00484	0.0362
	(0.0208)	(0.0276)	(0.0213)	(0.0263)
Late Deals	0.0485*	0.0377	0.0396	0.0554**
	(0.0270)	(0.0379)	(0.0261)	(0.0256)
Abnormal DP × Late Deal × Low DP Var Y4-Y6	0.00218	-0.0152	0.0591	-0.0127
	(0.0769)	(0.125)	(0.0782)	(0.0864)
Abnormal DP × Late Deal × Mid DP Var Y4-Y6	-0.147***	-0.160**	-0.134**	-0.137**
	(0.0435)	(0.0672)	(0.0526)	(0.0546)
Abnormal DP × Late Deal × High DP Var Y4-Y6	-0.158***	-0.158**	-0.155***	-0.172***
	(0.0452)	(0.0745)	(0.0429)	(0.0562)
Ln Deal Size	-0.107***	-0.113***	-0.104***	-0.112***
	(0.00882)	(0.00964)	(0.00900)	(0.00949)
Ln Fund Size	-0.000340	-0.0262	-0.00155	0.00896
	(0.00990)	(0.0236)	(0.0109)	(0.00888)
GP Low Reputation	-0.0566**	-0.0105	-0.0505*	-0.0476*
	(0.0240)	(0.0438)	(0.0257)	(0.0249)
Fundraising	-0.0242	-0.0527*	-0.0390*	-0.0324
	(0.0224)	(0.0274)	(0.0220)	(0.0219)
Market BM Ratio	-0.0169***	-0.0162*	-0.0181***	0.138***
	(0.00427)	(0.00881)	(0.00453)	(0.0182)
DP Industry Concentration	0.0462	-0.0336	0.0838	0.0868*
	(0.0450)	(0.0617)	(0.0544)	(0.0497)
Credit Spread	-0.0149	-0.0150	-0.0157	-0.00294
	(0.0146)	(0.0220)	(0.0128)	(0.0205)
Year-F.E	Yes	Yes	Yes	No
Industry-F.E	Yes	Yes	Yes	No
GP F-E	No	Yes	No	No
PBO Only	No	No	Yes	No
Time x Industry F-E	No	No	No	Yes
Number of Observations	966	966	773	966
Adjusted R^2	0.224	0.257	0.244	0.289

Table XIX – Deal analysis: Deal terms – Lewbel IV.
This table replicates the results of Tables VIII - XI in an IV setting following Lewbel (2012). The variable Abnormal DP' represents instrumented Abnormal DP variable. The first-stage regressions are displayed in Table A6. Owing to command limitations in the software, we did not cluster the standard errors. Standard errors are reported in parentheses. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Leverage	EBITDA Mult.	Cash Return	IRR
Abnormal DP'	0.00927	-0.870**	0.238	0.0201
	(0.0191)	(0.378)	(0.151)	(0.0224)
Late Deal	0.0119	0.0249	0.321	0.0483
	(0.0228)	(0.669)	(0.199)	(0.0297)
Abnormal DP' × Late Deal	-0.0821**	1.878**	-0.805***	-0.128***
	(0.0378)	(0.849)	(0.306)	(0.0455)
Ln Deal Size	-0.0493***	1.249***	-0.883***	-0.107***
	(0.00735)	(0.142)	(0.0499)	(0.00743)
Ln Fund Size	0.00627	-0.681***	0.222***	-0.000193
	(0.00860)	(0.190)	(0.0674)	(0.0100)
GP Low Reputation	-0.00518	-0.310	-0.194	-0.0574**
	(0.0206)	(0.426)	(0.152)	(0.0227)
Fundraising	-0.00862	-0.270	-0.0923	-0.0199
	(0.0176)	(0.393)	(0.144)	(0.0214)
Market BM Ratio	-0.0793	-0.257	0.497	0.0638
	(0.0549)	(0.596)	(0.328)	(0.0489)
DP Industry Concentration	-0.00159	0.586	0.665**	0.0473
	(0.0436)	(0.912)	(0.315)	(0.0470)
Credit Spread	0.00571	-0.0397	-0.122	-0.0138
	(0.0177)	(0.380)	(0.125)	(0.0187)
Year-F.E	Yes	Yes	Yes	Yes
Industry-F.E	Yes	Yes	Yes	Yes
Number of Observations	639	622	966	966
Centered R^2	0.214	0.346	0.31	0.258

Appendix

Table A1 – Fund sponsor variables: Definitions.
This table provides the definitions on fund sponsor variables.

Variable	Definition
Carried Interest	Performance-based component (in %) of the profit-sharing agreement between GP and LPs.
Dry Powder Y4 (resp. Y5)	One minus the ratio of the invested capital to the total committed capital of the fund. It represents the level of dry powder at the fourth (resp. fifth) year of the life of the fund (vintage year of the fund + 4, resp. +5).
Dry Powder Change (Y4 to Y6)	Difference in dry powder between vintage year of the fund + 4 and vintage year of the fund + 6.
Fund Size	Total committed capital of the fund (in $million).
Fundraising period	Period of time elapsing from the fundraising launching date to the closing date. When the fundraising launching date is not provided by Preqin, we assume a fundraising length of 18 months and a closing the quarter before the first capital call. Alternative length of 12 or 24 months are considered for robustness.
Fundraising	Dummy variable taking the value of 1 if the fund is in fundraising or preparing a fundraising (considering a lag of 1 year).
Fundraising Y4-Y6	Dummy variable taking the value of 1 if the vintage year + 4, +5 or +6 of the tested fund falls within the fundraising period of the follow up fund.
GP Age	Age of the fund's GP at the time of the vintage year of the fund, using GP establishment year data from Preqin which we complete using information taken from Pitchbook if missing on Preqin.
GP Low Reputation	Following Barber and Yasuda (2017) we define low reputation GPs as small (Less than $1B of cumulated committed capital before the tested fund), Young (Fewer than 3 funds launched before the tested fund) and lacking of a strong past records (No top quartile funds as of the inception of the tested funds). This represent a triple condition.
IMR	Inverse Mills ratio capturing the nonselection hazard for data availability.
KS-PME	Kaplan Schoar PME index which incorporates the performance contribution of a public market index by compounding each fund cash flow (capital calls and distributions) based on index performance. The index we used is the S&P500. Index performance is measured between the date of the cash flow and the valuation date.
Management Fees	Fixed component (in %) of the profit-sharing agreement that the GP received for their services (deal generation, selection, structuring, value adding, exiting).
Past Performance	TVPI or KS-PME of the previous fund launched by the PE firm in the same strategy (LBO, VC, or growth).
TVPI	Total Value Paid In Capital which is the sum of the cash flows distributed and the residual value, divided by the invested capital; computed at the end of the fund life.

Table A2 – Deal variables: Definitions.
This table provides the definitions on deal variables.

Variable	Definition
Cash Return	Ratio of the exit value of the portfolio company to the entry price.
Deal Club	Number of LBO buyer funds that are involved in the purchase of a target company.
Deal Size	Enterprise value of the target company (in $million), that is, the size of the transaction including leverage.
Dry Powder (DP)	Dry powder one quarter before the execution of the deal. It is computed as one minus the ratio of the invested capital to the total committed capital of the fund.
EBITDA Margin	EBITDA of the target company divided by the revenues of the target company.
EV/EBITDA Multiple	Ratio of the entry price over the latest available annual EBITDA for the target firm at the time of the LBO.
Fundraising	Dummy variable taking the value of 1 if the deal is executed within the fundraising period of the follow up fund.
GP Low Reputation	Following Barber and Yasuda (2017) we define low reputation GPs as small (Less than $1B of cumulated committed capital before the tested fund), Young (Fewer than 3 funds launched before the tested fund) and lacking of a strong past records (No top quartile funds as of the inception of the tested funds). This represent a triple condition.
Internal Rate of Return	Deal return obtained by a conversion of the cash return as follows: $(\text{cash return})^{(1/D)} - 1$.
Investment Duration	Number of years between the investment year and the investment exit.
Late Deal	Dummy variable taking the value of one if the investment year of the deal is superior or equal to vintage year + 4.
Leverage	Ratio of the total net debt to the enterprise value of the target company.
Target revenues	Latest available annual revenues for the target firm at the time of the LBO (in $million).

Table A3 – Economic variables: Definitions.
This table provides the definitions on economic variables.

Variable	Definition
Credit Spread	Following Hüther (2022), the credit spread corresponds to the spread between the Moody's BAA bond index over the 3 Month Treasury-Bill. Data are obtained from the FRED database.
DP Industry Concentration	Herfindhal index measuring the annual concentration of uninvested capital in each fund industry.
DP Industry Concentration	Following Ljungqvist et al. (2020), Herfindahl index of the concentration of uninvested capital held by buyout funds. The index is computed by determining the proportion of uninvested capital each fund holds in a given year relative to the total uninvested capital in its category (industry-specialist or generalist) in this same year.
High Credit Spread	The High Credit Spread variable is a dummy variable that equals one for a particular year if the annual credit spread is above the median value of our sample over the total time horizon.
High Value-Weighted Mean BM Ratio	The High Value-Weighted is equal to one if the Value-Weighted Mean BM Ratio of a given year is above the median value of the sample of our time period.
Log Real Funds Size, same vintage year	The total cash to deploy by all US buyout funds sharing the same vintage year and expressed in logarithm and in dollars adjusted for 2010 purchasing power.
Value-Weighted Mean BM Ratio	Following Ljungqvist et al. (2020), the annual value-weighted book to market is calculated as a capitalisation-weighted average of the book-to -market ratio from all listed US available in Compustat.

Table A4 – Fund Performance

This table replicates the analysis of Table VI but tests the incremental effects with regard to the category of fund with low DP variation between Y4 and Y6 (see Table III Panel B). Dependent variables are the realized TVPI (Total Value to Paid-In capital) (Panel A), and the realized KS-PME (Kaplan Schoar PME) (Panel B). IMR refers to the inverse Mills ratio capturing the non-selection hazard of disclosing information. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Panel A: TVPI				Panel B: KS-PME			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
High DP Y4	-0.236**	-0.193*	-0.135	-0.138	-0.192	-0.171	-0.103	-0.104
	(0.107)	(0.107)	(0.106)	(0.106)	(0.117)	(0.117)	(0.116)	(0.116)
High DP Y4 x Mid DP Var (Y4Y6)	-0.0655	-0.0788	-0.146	-0.138	-0.327**	-0.325**	-0.402***	-0.400***
	(0.133)	(0.132)	(0.131)	(0.131)	(0.146)	(0.144)	(0.143)	(0.143)
High DP Y4 x High DP Var (Y4Y6)	-0.139	-0.158	-0.215*	-0.210	-0.413***	-0.435***	-0.501***	-0.501***
	(0.130)	(0.129)	(0.128)	(0.128)	(0.142)	(0.141)	(0.139)	(0.140)
Q4 Past Perf.		0.319***	0.277***	0.318***		0.191**	0.126	0.135
		(0.0975)	(0.104)	(0.110)		(0.0834)	(0.0939)	(0.102)
Q3 Past Perf.		0.120	0.133	0.168*		0.160*	0.116	0.127
		(0.0808)	(0.0920)	(0.0969)		(0.0921)	(0.102)	(0.111)
Q2 Past Perf.		0.0536	0.0186	0.0678		-0.179	-0.182	-0.174
		(0.0871)	(0.0933)	(0.103)		(0.124)	(0.124)	(0.129)
Q1 Past Perf.		-0.0618	-0.0339	-0.00903		0.0272	0.00986	0.0145
		(0.106)	(0.109)	(0.111)		(0.129)	(0.132)	(0.134)
Ln Fund Size			0.0122	0.0484			0.0476	0.0558
			(0.0306)	(0.0442)			(0.0335)	(0.0479)
GP Low Reputation			0.0398	0.0449			0.0549	0.0559
			(0.0745)	(0.0746)			(0.0815)	(0.0817)
Fundraising Y4-Y6			0.239***	0.256***			0.267***	0.271***
			(0.0583)	(0.0601)			(0.0629)	(0.0655)
IMR				0.179				0.0409
				(0.157)				(0.171)
Vintage Year-F.E	431	431	431	431	431	431	431	431
Number of Observations	0.123	0.143	0.173	0.173	0.242	0.257	0.287	0.285
Adjusted R^2	0.123	0.143	0.173	0.173	0.242	0.257	0.287	0.285

Table A5 – Deal analysis: Deal Size, Club and Duration.
This table presents the relationship between dry powder and other deal characteristics such as the size (Ln Deal Size), the number of LBO buyer funds (Deal Club) and the investment duration (Duration). Standard errors are clustered according to investment year and are reported in parentheses. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Ln Deal Size	Deal Club	Duration
Abnormal DP	-0.0787	-0.0334	0.326*
	(0.0776)	(0.0507)	(0.168)
Late Deal	-0.0212	0.0623	-0.180*
	(0.0715)	(0.0560)	(0.0931)
Abnormal DP × Late Deal	0.0402	-0.127	-0.0293
	(0.0919)	(0.114)	(0.216)
Ln Deal Size		0.254***	0.0815
		(0.0373)	(0.0549)
Ln Fund Size	0.622***	-0.0894***	-0.0721
	(0.0278)	(0.0287)	(0.0445)
GP Low Reputation	-0.401***	0.00577	-0.148
	(0.0787)	(0.0556)	(0.0915)
Fundraising	0.131**	-0.114**	0.164*
	(0.0624)	(0.0483)	(0.0893)
Value-Weighted Mean BM Ratio	0.0288***	-0.0344***	0.0757***
	(0.00517)	(0.00470)	(0.00894)
DP Industry Concentration	0.209	0.205*	-0.0785
	(0.140)	(0.103)	(0.254)
Credit Spread	-0.166**	-0.0611*	-0.0672
	(0.0813)	(0.0341)	(0.0734)
Year-F.E	Yes	Yes	Yes
Industry-F.E	Yes	Yes	Yes
Number of Observations	2379	2379	1797
Adjusted R^2	0.339	0.152	0.134

Table A6 – Deal analysis: Lewbel IV/ First-stage regression.
This table provides the first stage regression of the Lewbel (2012) IV method. The dependent variable is the Abnormal DP one quarter before the execution of the deal. Standard errors are reported in parentheses. * stands for significant at 10%, ** significant at 5%, and *** significant at 1% level.

	Leverage	EBITDA Mult.	Cash Return	IRR
Lewbel(Late Deals)	0.0205	0.189***	0.0754*	0.0754*
	(0.0456)	(0.0529)	(0.0391)	(0.0391)
Lewbel(Ln Deal Size)	-0.0197	-0.0347**	-0.0192	-0.0192
	(0.0174)	(0.0169)	(0.0123)	(0.0123)
Lewbel(Ln Fund Size)	0.0221	0.0183	0.0120	0.0120
	(0.0204)	(0.0227)	(0.0166)	(0.0166)
Lewbel(GP Low Reputation)	-0.0717	-0.0341	-0.0138	-0.0138
	(0.0487)	(0.0510)	(0.0378)	(0.0378)
Lewbel(Fundraising)	-0.196***	-0.100**	-0.118***	-0.118***
	(0.0411)	(0.0468)	(0.0353)	(0.0353)
Lewbel(Value-Weighted Mean BM Ratio)	0.0916	0.0121	-0.0201	-0.0201
	(0.130)	(0.0714)	(0.0813)	(0.0813)
Lewbel(DP Industry Concentration)	-0.220**	-0.0390	0.0215	0.0215
	(0.103)	(0.109)	(0.0780)	(0.0780)
Lewbel(Credit Spread)	0.000188	0.0396	0.0288	0.0288
	(0.0419)	(0.0454)	(0.0311)	(0.0311)
Year-F.E	Yes	Yes	Yes	Yes
Industry-F.E	Yes	Yes	Yes	Yes
Number of Observations	639	622	966	966
Centered R^2	0.148	0.0689	0.0644	0.0644