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Optimal Capital Deployment: Dry Powder and the Option to Invest

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Abstract

Private equity (PE) firms operate in an environment where uninvested committed capital, or dry powder, influences investment pacing, pricing discipline, and fund performance. This study seeks to examine optimal fund investment in the context of the constraints implied by available dry powder with a focus on identifying the dynamic strategy that maximizes GP expected value. For example, the analysis seeks to examine if GPs undertake strategic actions, such as accelerating deployment or deterring competition in ways that increase GP value but not LP returns. In addition, the analysis seeks to evaluate potential spillovers of GP strategic behavior such as whether rising aggregate capital overhang inflates valuation multiples or allows dominant firms to restrict liquidity and limit new entry. By integrating fund-level cash flows with transaction pricing and investor composition, this study hopes to provide new evidence on how dry powder functions both as a constraint and a strategic tool, with implications for fund managers, investors, portfolio companies, and policymakers.

1. Research Objective

Private equity (PE) firms face a persistent tension between deploying capital into potentially profitable investments and maintaining the option to invest in future opportunities through committed, but uncalled capital, typically referred to as "dry powder." The decision to invest or keep dry powder depends on many factors including the current funds' age (i.e., years into the investment period), the amount of capital already deployed, current investment opportunity set, and current fundraising environment as well as a variety of market-wide or industry-specific factors (interest rates, market valuations, exit environment and realized investments). Moreover, the decision to invest, or not, i.e., keeping more dry powder, is a major strategic decision made by the General Partner (GP), yet one that has received almost no granular empirical research because of data limitations. With access to the detailed holdings data for private funds (especially private equity buyout funds) it is now possible to do a detailed analysis of fund's dynamic investment decisions (i.e., deployment pacing) through the lens of dry powder and the "option to invest." This analysis examines how individual fund behavior aggregates to market-wide conditions that are important to GPs, Limited Partners (LP), and other stakeholders including portfolio companies, lenders, and policymakers.

Over the past decade, capital committed to private funds, and thus dry powder levels have grown to unprecedented levels. As of December 2024, PE firms globally have amassed over $2.51 trillion (2023: $2.66 trillion) in dry powder, representing a 10-year annual growth rate of 10%.[1] These substantial reserves of uninvested committed capital prompt important questions regarding their influence on LP and GP behaviors, their impact on market competition, and broader industry dynamics. High levels of dry powder obviously reflect the overall growth of the private fund industry but are also affected by idiosyncratic strategies of GPs including how prudent GPs are in making investment decisions in a dynamic (and historically cyclical) market environment. The implications for fund performance, investor discipline, and capital allocation efficiency remain poorly understood in the existing literature.

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[1] *PitchBook. (2025). Q1 2025 Global Private Market Fundraising Report [PDF]. PitchBook. Retrieved from https://files.pitchbook.com/website/files/pdf/Q1_2025_Global_Private_Market_Fundraising_Report_19314.pdf*

Against this backdrop, my study seeks to empirically identify the determinants of dynamic investment behavior conditional on the firm's investment capacity (i.e., dry powder). Conceptually, this analysis examines the constrained optimization problem facing the GP where there is a limited pool of capital that can be deployed by a specific fund. More specifically, GPs are attempting to maximize their return (e.g., management fees, carry, and value derived from future funds) given their own internal resource constraints and a largely exogenous market-wide environment. The solution to this problem implies a dynamic "performance-optimal" level of dry powder at the fund level, which can be defined as the level of dry powder that maximizes GP franchise value. Building on Kaplan and Schoar's (2005) framework on cash-flow timing and capital allocation, I will use daily, net-of-fees cash-flow data from over 12,000 funds in the MSCI-Burgiss database to estimate the nonlinear relationship between dry powder ratios and subsequent fund performance conditional on GP, industry, and broad-market observables. In addition, I will assess whether the distribution of observed dry powder across the industry dynamically reflects this optimal level and relate this to the observed cyclical nature of PE markets. This analysis will assist in understanding whether over time commitment patterns reflect an efficient equilibrium or diverge meaningfully. To the best of my knowledge, this will be the first study to rigorously quantify the performance-maximizing dry powder level and evaluate its alignment with realized market behavior, with implications for both fund performance and the strategic interactions between LPs and GPs.

Having identified the performance-maximizing dry powder level, I will examine whether capital commitments tend to concentrate in funds operating near this threshold. This analysis investigates whether market-level allocation patterns reflect a preference for reserve discipline and efficiency. To account for heterogeneity in fund strategies and firm characteristics, I will explore whether the optimal reserve ratio varies systematically with factors such as firm age, firm size, fund scope, asset type, and historical pacing behavior. This will help determine whether a common benchmark exists or whether performance-maximizing levels are highly contingent on firm level characteristics or market cycles. If funds with reserve levels close to their estimated optimum consistently attract larger commitments or raise subsequent funds more quickly, this would suggest that capital flows internalize performance-aligned reserve benchmarks.

Such dynamics may function as a market-based monitoring mechanism, reinforcing discipline and aligning GP incentives with investor (LP) preferences.

For funds whose dry powder levels hover near the performance-optimal threshold, LP-driven discipline may prompt GPs to accelerate deal flow by adopting a broad deployment strategy, spreading capital across a larger number of smaller investments. By front-loading commitments, GPs signal responsiveness to LP expectations for timely deployment. However, this urgency can dilute average deal quality, compress returns, and increase monitoring costs, as managers trade depth of diligence for breadth of exposure. Conversely, when a fund's dry powder ratio exceeds the performance-maximizing level, GPs may exploit the overhang strategically, delaying new investments to influence entry multiples or deliberately withholding capital to deter rival sponsors from pursuing similar opportunities. While such tactics may strengthen bargaining positions or segment the market, they risk eroding LP trust and exacerbating liquidity mismatches.

Finally, the study will extend the analysis from fund-level dynamics to broader market conditions by examining whether aggregate dry powder levels influence overall deal activity and competitive behavior. Specifically, I will test whether rising capital overhang, defined as the portion of uninvested committed capital that exceeds what can reasonably be deployed, based on the market's recent absorption capacity, affects pricing and market access. Building on the earlier analysis of performance-maximizing reserve levels and limited partner allocation preferences, this component explores whether excess capital inflates valuation multiples by increasing competition for deals or enabling dominant firms to delay deployment in ways that restrict liquidity and discourage new entrants.

Taken together, this research will provide an integrated view of how dry powder shapes private equity behavior across multiple layers of the investment environment. It will identify the reserve ratio that maximizes fund performance, assess whether limited partners allocate capital in alignment with that benchmark, and examine how capital accumulation influences general partner strategy and broader market dynamics. By linking fund-level incentives to aggregate outcomes, the study will offer new evidence on how capital discipline and overhang affect performance, agency, and competition in private equity markets.

2. Background and related Literature

2.1. Background

Private equity (PE) funds are structured around a fixed pool of committed capital, drawn from limited partners (LPs) and managed by general partners (GPs), who are responsible for deploying it over a defined investment period. Dry powder, the portion of committed capital that remains uninvested, plays a central role in balancing flexibility and discipline in this structure. While maintaining dry powder allows GPs to capitalize on attractive opportunities, excessive accumulation can generate pressures to deploy capital rapidly, potentially diluting deal quality and compressing returns. As dry powder levels rise to historic highs, an important distinction emerges: funds operating near the performance-optimal reserve threshold may feel compelled to accelerate investment pacing to meet LP expectations, whereas funds with excess reserves may withhold deployment strategically, seeking to influence valuations or deter rival sponsors. This dynamic raise important questions about whether observed reserve levels reflect economically justified discipline or distortions linked to market timing, fundraising cycles, or agency concerns.

At the aggregate level, capital overhang refers to the volume of uninvested committed capital that exceeds the market's recent capacity to absorb and deploy funds. It is increasingly viewed as a key indicator of potential distortions in market dynamics. Persistent overhang may signal a misalignment between capital supply and the private equity sector's ability to deploy capital efficiently, creating upward pressure on valuations and influencing the timing and structure of exits, new fund formation, and GP decision-making. In this environment, large, well-capitalized funds may use excess reserves to pace deployment strategically, shaping liquidity conditions and restricting competitive access for smaller or newer participants. Whether reserve levels, both at the fund level and in aggregate, are performance-optimal or reflect strategic accumulation remains an open question, with important implications for capital efficiency, fund governance, pricing discipline, and the structure of private equity markets.

2.2 Related Literature

Several studies have examined the relationship between capital commitment behavior and private equity performance. Kaplan and Schoar (2005) provided foundational evidence on the persistence and cyclicality of PE fund returns, emphasizing the role of timing in capital deployment. Robinson and Sensoy (2013) further explored how cash flow timing impacts realized returns, highlighting that delays in capital calls can significantly influence IRR outcomes. Metrick and Yasuda (2010) detailed the economics of PE partnerships, including the incentives embedded in fee and carry structures, which may encourage capital hoarding or delayed investment under certain conditions. More recent work by Braun, Jenkinson, and Stoff (2020) examined fund pacing and found evidence that GPs adjust deployment rates in response to fundraising cycles, often independent of deal quality.

On the limited partner side, Lerner, Schoar, and Wongsunwai (2007) explored how LP sophistication affects fund selection and performance, while Andonov, Eichholtz, and Kok (2018) analyzed the behavior of pension funds, showing how institutional objectives shape private market exposure. Barber and Yasuda (2022) documented how LPs respond to past performance and organizational constraints when considering commitments, suggesting that capital allocation decisions may reflect implicit preferences for reserve discipline. Jenkinson, Sousa, and Stucke (2013) provided evidence that LPs systematically reallocate toward larger and more established funds during periods of capital abundance, potentially contributing to persistent overhang.

At the aggregate level, Harris, Jenkinson, Kaplan, and Stucke (2014) studied capital flows and returns, noting that capital inflows tend to follow past performance, often contributing to cyclical overhangs. Phalippou (2020) warned that growing reserve levels, combined with opaque pricing and illiquidity, create risks for allocators and distort the supply of capital. Gompers, Kaplan, and Mukharlyamov (2016) added that dominant firms may use reserve accumulation strategically to shape bargaining dynamics and deter rivals.

3. Methodology

This section outlines the empirical framework used to evaluate how dry powder influences fund performance, general partner behavior, investor allocation decisions, and broader market dynamics. The analysis proceeds through a multi-stage strategy: estimating the performance-optimal reserve level using a quadratic model, testing how capital deployment behavior responds to reserve levels using a hazard model, and evaluating whether allocation patterns reflect reserve discipline through a proportional model.

3.1 Dry Powder Measurements

Dry powder is measured at fund level as the difference between total committed capital and capital called:

$$Dry\ Powder_{it} = Committed\ Capital_{it} - Called\ Capital_{it}$$

To normalize across fund size, we define the dry powder ratio, used through the empirical analysis, as:

$$Dry\ Powder\ Ratio_{it} = \frac{Dry\ Powder_{it}}{Committed\ Capital_{it}} = 1 - \frac{Called\ Capital_{it}}{Committed\ Capital\ _{it}}$$

This ratio reflects the proportion of capital that remains uninvested at any given point in time. We construct a quarterly panel of dry powder ratios for each fund using time-series data from the MSCI-Burgiss database.

3.2 Fund Performance and Optimal Reserve Levels

To estimate the performance-optimal level of dry powder, the analysis models the nonlinear relationship between the average dry powder ratio during the investment period and fund performance. The baseline measure of performance will be the Public Market Equivalent (PME), which compares fund cash flows to a public market benchmark to control for timing effects and provide a market-adjusted return.

$$PME_i = \beta_0 + \beta_1 Dry\ Powder\ Ratio_i + \beta_2 (Dry\ Powder\ Ratio_i)^2 + X_i{}'_{\gamma} + \varepsilon_i$$

Where:

$PME_i = Public\ Market\ Equivalent = \frac{\Sigma\ (discounted\ distributions\ using\ index\ returns)}{\Sigma\ (discounted\ contributions\ using\ index\ returns}$

$X_i = controls\ for\ fund\ size, strategy, vintage\ and\ other\ characteristics$

Hypothesis 1: There exists a concave relationship between dry powder ratio and fund performance, with diminishing marginal returns to reserve capital.

We expect β_1>0 and β_2<0, implying an internal maximum:

$$Optimal\ Dry\ Powder\ Ratio^* = \frac{\beta_1}{2\beta_2}$$

This specification provides a benchmark for evaluating LP preferences and GP behavior in subsequent models. For robustness, the internal rate of return (IRR) will be estimated as a secondary performance measure.

3.3 General Partner Deployment Behavior (Hazard Model)

To test how general partners internalize reserve levels in their capital deployment behavior, I estimate a Cox proportional hazards model. The event of interest is reaching a specific deployment threshold (e.g. 80%-90% of capital called), and the hazard rate captures the intensity with which GPs deploy capital over time.

$$Hazard\ Rate_{it} = H_{0t} + e^{\beta_1 * Distance_i + X_i{}'\gamma}$$

$Hazard\ Rate_{it} = Hazard\ Rate\ for\ fund\ i\ at\ time\ t$

$Distance_i = |Dry\ Powder\ Ratio_i - \ Optimal\ Dry\ Powder\ Ratio^*|$

$H_{0t} = Baseline\ Hazard\ Rate\ at\ time\ t\ for\ an\ individual\ whose\ covariates\ are\ all\ equal\ to\ zero$

Hypothesis 2: Funds closer to the performance-optimal reserve level deploy capital more quickly. A significantly negative coefficient on $Distance_i$ would indicate that funds deviating from the optimal level exhibit slower deployment pacing.

This model captures the dynamic nature of GP behavior and tests whether reserve discipline influences deployment intensity.

3.4 Limited Partner Herding Behavior (Proportional Model)

To test whether capital markets (LPs) reward reserve discipline, I examine whether funds operating near the performance-optimal dry powder level are more likely to raise follow-on funds or attract larger

commitments. A linear or logistic model is estimated depending on the outcome variable (e.g., next fund size or follow-on success):

$$Funding_{ij} = \alpha + \beta_1 Distance_i + X_i{}'_{\gamma} + \epsilon_{ij}$$

Where:

$Funding_{ij}$ represents the subsequent fund size, capital commitments or time to next fundraise

$Distance_i = |Dry\ Powder\ Ratio_i - Optimal\ Dry\ Powder\ Ratio^*|$

X_i' includes fund and LP characteristics.

Hypothesis 3: Funds closer to the performance-optimal reserve level are more likely to succeed in fundraising. A significantly negative β_1 suggests that investors allocate more capital to funds with reserve levels aligned with performance benchmarks.

This model captures whether observed capital flows reflect implicit market discipline and preference for efficient capital management.

3.5 General Partner Deployment Behavior

We define investment pacing as the speed at which committed capital is deployed:

$$Investment\ Pacing_{it} = \frac{Capital\ Deployed_{it}}{Committed\ Capital_{it}}$$

To test whether GP deployment behavior responds to the performance optimal reserve level, we define

$$Distance_{it-1} = |Dry\ Powder\ Ratio_{it-1} - Optimal\ Dry\ Powder\ Ratio^*|$$

To test whether high dry powder reserves accelerate deal flow, we estimate:

$$Investment\ Pacing_{it} = \beta_0 + \beta_1 Distance_{it-1} + \beta_2 X_{it} + \alpha_i + \gamma_t + \varepsilon_{it}$$

Where:

α_i= fund fixed effect

γ_i= time fixed effect

X_i= time-varying controls (e.g., fund age, macro conditions, fundraising conditions)

Hypothesis 4: GP investment pacing varies systematically with distance from the performance-optimal dry powder ratio. A significantly negative β_1 would indicate that GPs closer to the optimal reserve level deploy capital more rapidly, possibly to signal discipline or meet LP expectations. In contrast, greater deviation from the optimal ratio may correspond to slower or more strategic pacing.

Note on Null Hypothesis:

The appropriate null is not merely "no relationship" between distance and pacing, but potentially a constant deployment rate over the investment period. That is, under the null, GPs are assumed to deploy capital smoothly and proportionally over time (e.g., linear deployment), regardless of reserve levels. This baseline provides a meaningful benchmark against which to detect strategic or reactive deviations in pacing behavior.

3.6 Market-Level Capital Overhang, Market Effects and Spillover Effects

To assess whether excess reserves distort private equity market dynamics, we construct a measure of capital overhang that captures the degree to which dry powder exceeds recent market deployment capacity.

First, total dry powder at the market level is calculated as the sum of uncalled committed capital across all active funds in a given quarter:

$$Aggregate\ Dry\ Powder_t = \sum_{i \in F_i} (Committed\ Capital_{it} - Contributions_{it})$$

To estimate the market's absorptive capacity, we calculate the average volume of capital deployed over the preceding four quarters:

$$Deployment\ Capacity_t = 1/4 \sum_{a=t-4}^{t-1} \sum_{i \in F_8} Capital\ Deployed_{i8}$$

We define Capital Overhang as the difference between these two components:

$$Capital\ Overhang_t = Total\ Dry\ Powder_t - Deployment\ Capacity_t$$

This measure reflects excess uninvested capital that exceeds what could plausibly be deployed based on recent market behavior. Overhang may generate competitive distortions, particularly by driving up valuations or limiting market entry.

(a) Valuation Effects

To test valuation effects, we estimate the following model:

$$Valuation\ Multiple_{it} = \beta_0 + \beta_1 \log\left(Capital\ Overhang_t\right) + \beta_2 X_{it} + \varepsilon_t$$

Where:

$Valuation\ Multiple_{it}$ = observed pricing multiple (e.g., EV/EBITDA) for transaction by fund i in quarter t.

X_{it}=controls for fund type, sector exposure, deal size, and macro conditions

Hypothesis 5: Valuation multiples increase with capital overhang due to heightened competition for limited deal flow. A significantly positive β_1 supports this hypothesis.

(b) Entry Constraints

To test whether overhang constrains entry by new or smaller funds, we estimate:

$$New\ Fund\ Count_t = \beta_0 + \beta_1 \log\left(Capital\ Overhang_t\right) + \beta_2 W_t + \varepsilon_t$$

$New\ Fund\ Count_t$=number of new funds launched in quarter t

W_t=time-varying controls such as interest rates, public market returns, investor sentiment.

Hypothesis 6: High capital overhang reduces new fund formation or delays new entrants. A significantly negative γ_1 supports this hypothesis.

(c) Exit Timing

We test whether capital overhand alter GP exist behavior:

$$Holding\ Period_{ijt} = \beta_0 + \beta_1 log(Capital\ Overhangt) + \beta_3 Zijt + \varepsilon ijt$$

$Holding\ Period_{ijt}$ = time between investment and exit for deal j in fund i

Hypothesis 7: Capital overhang systematically affects GP exit timing, either by accelerating or delaying realizations.

(d) Syndication Behavior

We test whether overhang increases the frequency or breadth of deal syndication:

$$Syndicate\ Size_{jt} = \beta_0 + \beta_1 log(Capital\ Overhangt) + \beta_3 Djt + \varepsilon jt$$

$Syndicate\ Size_{jt}$ = the number of co-investors in deal j in quarter t, Djt = deal-specific controls

Hypothesis 7: High capital overhang is associated with larger or more frequent syndicates, reflecting shared risk or increased competition.

(e) Deal Composition and Risk Profile

We examine whether capital overhang alters the composition of deals toward higher-risk or non-core strategies:

$$High\ Risk\ Deal\ Share_t = \beta_0 + \beta_1 log(Capital\ Overhangt) + \beta_3 Mt + \varepsilon t$$

$High\ Risk\ Deal\ Share_t$ = proportion of deals in time t involving negative EBITDA, early-stage targets, or non-buyout strategies, Mt = captures micro controls

Hypothesis 8: Capital overhang shifts deal flow toward higher-risk investments or less traditional sectors.

(f) Fundraising Concentration

We test whether capital overhang leads to concentration of LP commitments among a few large GPs:

$$HHI_t = \beta_0 + \beta_1 log(Capital\ Overhangt) + \beta_3 Lt + \varepsilon t$$

HHI_t = Herfindahl-Hirschman Index of fund inflows in quarter, Lt = measures of capital availability and fund demand

Hypothesis 9: Capital overhang increases fundraising concentration, favoring established GPs and crowding out smaller managers.

(g) LP Commitment frictions

$$Fundraising\ Shortfall_i = \beta_0 + \beta_1 log(Capital\ Overhangt) + \beta_3 Xi + \varepsilon t$$

$Fundraising\ Shortfall_i$ = percentage difference between actual and target capital raised (if possible)

Hypothesis 10: High capital overhang contributes to slower LP commitment pacing and increased failure to meet fundraising targets.

3.7 Integrated Methodology Summary

The empirical framework combines fund-level and market-level models to analyze how dry powder and capital overhang influence private equity performance, behavior, and market dynamics. The methodology proceeds in six core stages:

Section 3.1 defines and measures dry powder and constructs a quarterly panel of dry powder ratios using fund-level cash flow and commitment data from the MSCI-Burgiss database.

Section 3.2 estimates a nonlinear (quadratic) relationship between average dry powder ratios and fund performance using Public Market Equivalent (PME) as the baseline metric, identifying a performance-optimal reserve level that serves as a benchmark for subsequent analysis.

Section 3.3 tests whether general partners internalize reserve levels when pacing capital deployment. A Cox proportional hazards model estimates the effect of distance from the optimal reserve level on the likelihood of reaching deployment thresholds over time.

Section 3.4 examines whether LPs reward reserve discipline by evaluating whether funds closer to the optimal reserve level are more likely to raise follow-on funds, attract larger commitments, or raise capital more quickly. A proportional model captures these relationships based on fundraising outcomes.

Section 3.5 uses panel regression to test whether GP investment pacing (capital deployed as a proportion of committed capital) varies systematically with deviation from the performance-optimal reserve level. This model evaluates deviations from the baseline of constant, proportional capital deployment over the investment period.

Section 3.6 constructs a quarterly measure of capital overhang defined as the excess of aggregate uncalled capital over the market's recent deployment capacity and assesses a wide range of market-level spillover effects.

These include:

- **(a) Valuation Effects**: Testing whether capital overhang inflates deal-level pricing multiples.
- **(b) Entry Constraints**: Assessing whether excess capital deters the launch of new funds.

(c) Exit Timing: Estimating whether capital overhang alters GP exit behavior through changes in portfolio company holding periods.

(d) Syndication Behavior: Investigating whether overhang increases syndicate size and deal-sharing among GPs.

(e) Deal Composition and Risk Profile: Measuring whether excess reserves shift investment activity toward higher risk or non-core strategies.

(f) Fundraising Concentration: Testing whether capital becomes more concentrated among a small number of large, established GPs.

(g) LP Commitment Frictions: Evaluating whether overhang slows LP commitment pacing and increases the likelihood that funds fail to reach fundraising targets.

Together, this multi-stage methodology provides an integrated analysis of how dry powder influences fund performance, GP behavior, and systemic market outcomes. It connects individual reserve management decisions to broader implications for capital efficiency, competition, governance, and market structure in private equity.

4. Data

This study relies on the MSCI-Burgiss dataset, a proprietary database that provides detailed, time-stamped information on cash flows, valuations, and fund characteristics for a global sample of private equity vehicles. The data are reported directly by limited partners (LPs) and drawn from their internal accounting records, resulting in a high degree of completeness and reliability relative to other commercial sources. The LP-sourced reporting structure minimizes survivorship and self-reporting biases, making the dataset particularly well-suited for empirical analysis of capital deployment and fund behavior over time.

The sample is restricted to buyout funds, excluding funds of funds, venture capital, growth equity, and other non-buyout strategies. This restriction ensures consistency in investment strategy

and capital structure, allowing for more meaningful comparisons across funds. The resulting panel includes several thousand buyout funds spanning multiple vintages and geographic regions.

The fund-level component of the dataset includes quarterly data on committed capital, capital calls, distributions, net asset values (NAVs), and fees, allowing for precise calculation of dry powder ratios and fund performance metrics such as the Public Market Equivalent (PME) and internal rate of return (IRR). Additional categorical variables capture fund size, strategy, manager tenure, and family affiliation, enabling rich control structures in both cross-sectional and panel regressions.

A key strength of this study lies in its use of the holdings-level data embedded within each fund. These data contain time-stamped information on individual portfolio company investments, including deal-level valuations, cash flow events, and exit outcomes. This granularity supports empirical tests of general partner behavior across several dimensions, including capital deployment pacing, exit timing, syndication breadth, and shifts in portfolio risk exposure. By linking deployment activity to fund-level reserve accumulation, the study extends existing research that has largely focused on fund aggregates and summary statistics.

Because LP identities are not disclosed and cannot be inferred from the data, the analysis does not distinguish behavior by investor type. Instead, it focuses on observable fundraising outcomes such as follow-on fund size, capital inflows, and time to next fundraise as proxies for investor response to reserve management practices.

5. Timetable

The proposed research will unfold over an estimated twelve to fifteen months, depending on data access and the scope of feedback during the review process. The project will proceed in three phases:

Months 1–2: Data exploration and construction of the final analytical dataset, including validation of fund- and holdings-level variables and derivation of key measures such as dry powder ratios, deployment pacing, and capital overhang.

Months 3–8: Primary statistical analysis, including estimation of performance-optimal reserve levels, modeling of general partner and investor behavior, and assessment of market-level effects.

Months 9–15: Follow-up analyses, robustness checks, and empirical refinements in response to feedback from advisors, peer reviewers, or conference presentations. Final preparation of manuscripts for submission to academic journals.

This structure allows flexibility to incorporate new insights that emerge during the analysis and ensures sufficient time for thorough testing and refinement.

The research will proceed in five core stages. First, we will secure access to the MSCI-Burgiss dataset, review documentation, and verify data completeness. Next, we will prepare and structure the data, constructing key variables such as dry powder ratios and investment pacing metrics. The third stage involves data exploration and preliminary analysis to identify patterns in reserve dynamics. We will then implement the full econometric strategy, including estimation of optimal reserve levels, LP allocation models, pacing regressions, and market-level overhang effects. Finally, we will validate the results, conduct robustness checks, and prepare the manuscript for submission. We anticipate completing the primary analysis within 12 months, with targeted journal outlets including the Journal of Finance, Review of Financial Studies, Journal of Financial Economics, Journal of Financial and Quantitative Analysis, and Review of Finance.

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