The Trillion Dollar Bonus of Private Capital Fund Managers

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Abstract

Carried interest ("carry") is the main performance-based component of compensation for private capital fund managers. Using fund-level cash flows and fee terms for more than 12,000 funds, we estimate which funds are in-the-carry and the total amount earned. Aggregate carry exceeds one trillion dollars and accounts for 18% of investor profits, about equal the contractual value-weighted rate of 19%. The difference reflects the role of hurdle rates and the relatively smooth distribution of fund outcomes. Carry is strongly related to both performance and fund size, and past carry is a stronger predictor of future performance than past returns.

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1 Introduction

Private capital firms are advisory companies headquartered in major financial hubs such as New York and London. They advise private capital funds, structured as limited partnerships and typically domiciled in jurisdictions with favorable legal and tax regimes (e.g., Delaware, Cayman Islands, British Virgin Islands, Luxembourg). Senior employees of advisory firms receive a fixed salary, taxed as ordinary income, and a variable component conditional on fund performance: the carried interest ("carry"). This payment resembles a performance-related bonus, except that employees often, but not always, co-invest in the fund to be eligible. Most tax laws treat carry as a capital gain rather than labor income, which has generated significant debate.[1]

Despite the centrality of carry to incentives and pay, no comprehensive source records the aggregate amount paid or due. Investors historically did not track carry,[2] tax records do not isolate it, and public disclosure is sparse. This paper provides the first large-scale estimate of *total* carry in private markets, defined as realized carry (paid) plus unrealized carry (owed conditional on current NAVs).[3]

We assemble, to our knowledge, the largest dataset on headline fee terms (carry rate (CR), hurdle rate (HR), and catch-up rate (CU)), document the modal contract, and identify strategy–region-vintage for which terms systematically deviate from it. We then impute missing terms at the strategy–region–vintage level and attach a complete fee vector to the 12,137 funds raised between 2000 and 2019 for which aggregate performance figures are available as of end-2024.[4] This data are sufficient to place each fund in the carry waterfall with reasonable accuracy.

Together, the funds in our working sample deployed about \$8 trillion and returned about \$13 trillion net of fees. We estimate that aggregate carry exceeds \$1 trillion. This total carry is economically significant. For context, Vanguard manages a comparable stock of assets and collects roughly \$7 billion per year in fees (\$35 billion over a five-year horizon, the average holding period of private capital investments).

[1] See Imparato (2024), Utke (2024), and Neidle (2023) for discussion.

[2] Investors did not record carry because it is netted from distributions and commonly framed as a share of profits rather than a fee. As agents, LPs also prefer to report the lowest possible fee burden to their principals. Recently, some governments have mandated disclosure. For example, CalPERS was instructed to report carry paid in 2015; compilation took a year and submissions remained incomplete. CalPERS ultimately reported \$3.4 billion of realized carry, omitting unrealized carry. Dutch pension funds now publish carry paid.

[3] We do not observe the carry basis and therefore cannot decompose realized from unrealized at scale. Estimating *total* carry requires performance and fee terms, which we observe.

[4] All funds are therefore past their investment period. We focus on funds raised in the first two decades of the 21st century for ease of presentation and because this is when nearly all the capital has been invested.

The carry pool is highly concentrated. Geographically, 70% of the carry pool accrues to U.S. managers, even though less than one third of committed capital originates in the U.S. Most importantly, more than half of total carry accrues to leveraged buyouts, while venture capital accounts for less than $100 billion (under 10% of the total). This composition matters for policy debates often framed around venture formation: favorable tax treatment of carry is frequently justified by VC's role in innovation, yet we find that the bulk of carry is earned in buyouts by a relatively small number of large managers.

The *effective* share of profits absorbed by carry is close to contractual terms. Carry amounts to about 18% of investor profits, compared with a value-weighted contractual rate of 19%. The narrow gap reflects hurdle rates and the relatively smooth distribution of fund outcomes. Put differently, the trillion-dollar figure arises primarily from *scale and incidence*: many funds are in-the-carry on a large capital base. The contrast with hedge funds is instructive. With non-linear incentive fees, investor redemptions (open ended structure), and high-watermarks that do not retroactively refund prior charges, effective rates can far exceed nominal percentages (Ben-David, Birru, and Rossi (2023)). By contrast, private capital funds are closed-end vehicles with multi-year horizons and clawback provisions, which tighten the mapping from contractual to realized rates.

We also make use of a large, up-to-date cash-flow dataset covering more than 4,000 funds with daily capital calls, distributions, and NAVs. Using these data, we compute several abnormal-performance measures, and estimate betas for each of the main private-market sub-asset classes. This yields an updated view of risk-adjusted performance and permits comparisons across methodologies. Relating compensation to outcomes, we find that realized carry co-moves strongly with performance even after risk adjustment. In dynamic tests, *past carry* is a more robust predictor of subsequent performance than *past returns*, consistent with the idea that realized compensation aggregates information about persistent manager quality (Berk and van Binsbergen (2015)). However, the strength of these relations depends on the degree of overlap between successive funds and on the performance metric employed.

A second contribution of the paper is an investor–level analysis based on a unique dataset of limited partners (LPs). We assemble, to our knowledge, the largest panel of LP–fund holdings available to date, covering public and private pensions, endowments, foundations, asset managers, and captive investors (insurance, corporate, sovereign, and family offices). For each LP–fund pair we observe the investor identity, the fund's characteristics including fee terms, and (partially) the commitment size.[5] This construction allows us to aggregate performance and fees at the LP level and to compute *effective* carry investor by investor.

[5] Where commitment sizes are missing, we impute exposures.

This LP lens is economically important because portfolio choice can lead to deviations between effective and contractual carry rates. Consider a simple thought experiment: an investor commits \$100, allocating \$25 to funds that lose everything and \$75 to funds that double (distribute \$150). With a 20% carry applied to the winners' profits, the GP earns $0.20 \times (150 - 75) = 15$. Net distributions to the investor are therefore $150 - 15 = 135$, implying investor profit of $135 - 100 = 35$. The *effective* carry rate is then $15/35 \approx 43\%$, far above the 20% headline rate.

Only a small minority of investors face extreme fee incidence. 2.4% of LPs pay an *effective* carry above 25% of profits (or a negative rate). The incidence is higher for asset managers (5%) and much lower for pensions and endowments (each below 1.5%). In regressions of LP-level effective carry on performance and portfolio composition (strategy and geography shares, fund-of-funds exposure), most cross-type gaps shrink markedly: asset managers' higher incidence is largely explained by lower FoF allocations and different strategy/region tilts. After controls, however, endowments (and, to a lesser extent, public pensions) still exhibit systematically lower effective rates. Because headline performance is similar across LP types — and is directly controlled for — this residual difference is consistent with endowments selecting portfolios whose outcome distribution is more homogeneous.

Finally, we conduct two robustness exercises. First, survivorship and coverage: we predict performance for the universe of funds without reported TVPI using a model fitted on vintage, strategy, geography, and size, and then apply uniform TVPI haircuts of 2.5–10% to reflect possible selection. The implied carry for this "missing" segment ranges from \$532 billion (no haircut) to \$408 billion (10% haircut). Combining these extrapolations with the in-sample estimate yields an aggregate of roughly \$1.4–\$1.5 trillion. Because both profits and carry fall under these haircuts, the *effective* carry rate moves little. Second, NAV sensitivity and clawbacks: replacing the latest NAV with $(1 - h) \times \text{NAV}$ for $h \in \{0.10, 0.25, 0.50, 0.90\}$, recomputing TVPI, and re-evaluating the waterfall produces a monotone, piecewise-convex profile: modest haircuts have limited impact, but beyond 50% reductions accelerate as more funds cross the hurdle and trigger clawback. Even an extreme 90% write-down — well beyond plausible stress — roughly halves aggregate carry.

Our findings have implications for three active debates. First, on the size and growth of the financial sector (Philippon (2015), Zingales (2015), Greenwood and Scharfstein (2013)), carry is only a portion of the revenue generated by private capital intermediation, yet our trillion-dollar estimate underscores its quantitative importance.[6] Second, on taxation, pro-

[6] The spread between net and gross returns of private capital funds has been estimated at about 7% per annum when accounting only for management fees and carry (Phalippou and Gottschalg (2009)). See also Metrick and Yasuda (2010), Phalippou, Rauch, and Umber (2018).

posals to treat carry as ordinary income often cite the need to close a perceived loophole; a common counterargument is that such a change would hamper venture capital formation (Barrios and Hochberg (2021)). Our quantification shows that venture capital accounts for a small fraction of the carry pool.[7] A back-of-the-envelope calculation suggests that, in the United States, taxing carry as ordinary income rather than capital gains would have raised on the order of $250 billion in additional revenue over our sample period. Third, on inequality and top incomes, carry payments may be large enough to affect distributional statistics (Piketty and Zucman (2014), Saez and Zucman (2016), Catherine, Miller, and Sarin (2025)) and to spill over into pay-setting for comparable talent markets (Kaplan and Rauh (2013)).

Our evidence also relates to several strands of literature. Earlier work finds little systematic relation between carry levels and net-of-fee performance (e.g., Gompers and Lerner (1999), Robinson and Sensoy (2013), while other studies document links between contractual features (e.g., American-style waterfalls) and realized outcomes (Hüther, Robinson, Sievers and Hartmann-Wendels (2020)). Ivashina and Lerner (2019) analyze the allocation of carry within private capital firms and reveal that a significant portion of carry is received by the firm founders, independent of their past investment achievements, indicating a stronger association of carry with seniority rather than performance. In addition, there is extensive literature on the compensation of mutual fund managers. A recent study by Cen, Dou, Kogan, and Wu (2024) review the current state of this expansive literature and conclude that the remuneration of a mutual fund manager is mostly based on assets under management. We complement this evidence by focusing on realized carry outcomes. Dollar carry and relative carry (carry-to-profit) track risk-adjusted performance and GP size; dynamically, past carry contains information about subsequent abnormal performance that is not fully captured by past returns — patterns reminiscent of compensation–value-add links in public-market intermediation (Berk and van Binsbergen (2015)), but with the notable twist that PME-type (scaled) abnormal performance aligns more tightly with carry than absolute measures such as NPV.

The rest of the paper proceeds as follows. Section 2 describes the data and the construction of risk-adjusted performance metrics. Section 3 details the carry computation. Section 4 contains the empirical analysis, and section 5 briefly concludes.

[7] This difference between VC and LBO may also matter for legal definitions. Neidle (2023) argues that in the U.K., treating LBO carry as capital gains contradicts the tax code because LBO activity is closer to trading than investing; the capital gains treatment may apply more naturally to VC than to LBO.

2 Data

2.1 Data sources

We use four datasets from Preqin (a Blackrock company), all of which were downloaded in March 2025.

Fund Performance. We select funds raised between 2000 and 2019 for which performance information is available (either IRR or TVPI), size is at least $10 million.[8] All funds are therefore close to the end of (or out of) their investment period. There are 12,137 funds.

Fund Cash Flows. For these funds, we have the underlying cash flows in and out of the fund. We can then compute abnormal performance metrics such as the Public Market Equivalent (PME), or Net Present Value (NPV). Of the 12,137 funds in the working sample, 4,122 funds are in the fund cash flow dataset.

Investors. This data set records some of the fund investors. There are 39,726 unique funds and 15,903 unique investors (LPs), for a total of 220,566 investor-fund pairs. We compute the investor exposure to each fund (their commitment divided by the size of the fund). Funds not in the working sample are removed, and investors must have at least five funds in their portfolio to be included in the sample.[9] This reduces the number of observations by half: 119,077 investor-fund pairs (3,152 unique investors).

Fund Terms. Preqin provides key fee parameters for a set of anonymized funds. For each fund, we have the strategy, size range, focal region, and vintage year. We first group funds by strategy, then split between U.S. and non-U.S. if there are more than 10 observations in a group, we further split by geographical focus (North America, Europe, Rest of the World). If there are still more than 10 observations in a group we further split by vintage (2000s, 2010s), and then by size (above or below $ 1 billion; labeled large vs mid-market).

2.2 Descriptive Statistics

2.2.1 Key Fee Terms

To the best of our knowledge, this is the largest dataset of fund terms analyzed to date. The descriptive statistics are therefore novel and provide useful insight into the extent of

[8] We also remove 703 funds that are less than three years old at the time of reporting (year of reporting minus vintage year). Next, we remove all funds that meet all three conditions: (i) a large residual value (above 50%), (ii) an old report date (before December 2018), and (iii) less than ten years old. This should remove funds that stop reporting whilst still active.

[9] We remove observations where an investor has more than 50% of a fund (2% of the observations).

variation (or lack thereof) in fee structures across funds.

The grouping procedure described above yields 109 categories for the variable *Carry Rate (CR)*, with 6,390 funds reporting CR. The largest group is mid-market U.S. buyout funds raised in the 2010s (619 observations), while the smallest is large U.S. mezzanine funds raised in the 2000s (11 observations). Across nearly all groups, the median CR is 20%. The exception is funds-of-funds (FoFs) and secondaries. Since secondaries are effectively a form of FoF, the central finding is that every major strategy charges a 20% carry, except FoFs. Within FoFs, however, there is some variation. As shown in Table 1 Panel A, U.S. secondaries raised in the 2010s have a median CR of 18.75% if mid-market and 12.5% if large. No FoF or secondary fund category reports a 20% median carry rate; instead, most exhibit a median of 10%.

For Hurdle Rates, we observe 4,576 funds grouped into 96 categories. The largest group is mid-market U.S. buyout funds raised in the 2010s (408 observations), while the smallest is infrastructure debt funds (10 observations). Here, unlike with carry rates, there is significant dispersion. Twenty-four of the 96 groups have a median HR different from the industry standard of 8%. Most of these groups are either venture capital or real asset focused.

Panel B reports the median HR for all early-stage and generalist venture capital categories. For U.S. early-stage funds, the median hurdle rate was zero in the 2000s and only slightly positive (0.5%) in the 2010s. Outside the U.S., early-stage funds generally report hurdle rates close to 8%. For generalist venture capital funds, U.S.-focused ones also had zero HR in the 2000s but adopted the standard 8% in the 2010s.

Real estate opportunistic and value-add (RE Opp/VA) funds slightly deviate from the standard 8%. Their median HR was around 9% in the 2000s, decreasing to 8% in the 2010s (except for funds outside the U.S. and Europe). Other categories with different medians (not tabulated) include: direct lending outside the U.S. (7%), infrastructure debt and timber funds (slightly below 8%), and real estate debt funds outside the U.S. and Europe (10%). Some fund-of-funds categories also report median HRs below 8%, with real estate FoFs standing out at 9%.

There are fewer observations for Catch-up (CU) rates: 781 observations and 37 groups. In non-tabulated results, we observe that real estate funds have the lowest CU rates, with medians around 50–80%. Infrastructure and natural resources funds cluster around 80–90%, while co-investment funds typically are at 90%, and all the other categories have a median catch-up of 100%.

[Insert Table 1]

2.2.2 Data interpolation

The "Fund Terms" dataset used in the previous subsection is predominantly anonymized. For example, fund identifiers are available for 1,826 out of the 6,390 observations with a reported carry rate. However, given the limited variability in fee terms within each group, we impute missing values with a reasonable degree of confidence by assigning the group-level median parameters (carry rate, hurdle rate, and catch-up rate) to funds lacking this information. As a result, each of the 12,137 funds in the working sample is assigned a complete set of headline fee terms.

In addition, 585 funds lack size information. As with fee terms, we impute the missing values using the group-level median size. When the fund sequence number is missing, we assign a value of one, since it is typically the GP's only fund within that strategy. For 762 funds with missing values for the fraction of capital called, we substitute the overall sample average of 95.3%.

Performance measures also require imputation. There are 1,363 funds with a reported TVPI but no IRR, and 1,265 funds with an IRR but no TVPI. We use the following relationship, assuming a duration of four years (the sample average), to replace missing values:

$$TVPI = (1 + IRR)^D$$

This identity holds in the absence of interim cash flows, with D representing the investment duration. Because multiple cash flows typically occur, D diverges from the effective duration (as defined in the fixed income literature; see Phalippou and Gottschalg (2009)), so the equation should be regarded as an approximation. We also use it to derive a duration for each fund, which we winsorize at the 75th percentile (5.6 years) to avoid extreme values.

Although our dataset includes a large number of investor–fund pairs, commitment sizes are observed for only about one-third of them. For each investor, we calculate the median observed commitment share across all their funds, capping values at 13% (the 75th percentile of the distribution). This median is then used to impute missing exposures for that investor. For investors with no observed commitments at all, we assign the overall sample median of 2.9%. Finally, in cases where the sum of actual and imputed commitments exceeds the reported fund size, we proportionally scale down all commitments so that their total matches the fund size.

2.2.3 Fund, Investor, and Manager Characteristics

We classify funds into five broad strategy categories. Using the *Asset Class* field from Preqin, we assign funds labeled as Venture Capital and Private Debt directly to these respective groups. We construct a third category, *Real Assets*, by combining funds classified as Real Estate, Infrastructure, or Natural Resources. Preqin's broad Private Equity category is subdivided: Buyout funds are separated from all other private equity strategies, which we group under *Other PE*. This residual category includes growth equity, fund-of-funds, secondaries, and multi-strategy vehicles.

Table 2 Panel A shows the distribution of funds across strategies and by region of investment focus. The number of funds is relatively balanced across categories. Buyout and Venture Capital funds are equally numerous. Regional differences are notable: Europe has twice as many Buyout funds as Venture Capital funds, while the reverse holds for the Rest of the World (RoW).[10] Private Debt has fewer funds in number but still represents more than half the number of Buyout or Venture Capital funds. Real Assets is the largest category, with 3,463 funds. There are 3,046 other PE funds; it is the largest category in Europe, reflecting that region's focus on growth capital and an important provider of fund-of-funds. The U.S. has a high share of Real Asset funds, while RoW has few Private Debt funds.

Panel B shows fund characteristics. The average fund size is $663 million, but the median fund is much smaller ($253 million). The median fund is the second one raised by its GP. On average, funds have drawn down 95% of the committed capital (fund size), with the median fund having called an even higher proportion at 98%. Such figures are anticipated given that the funds examined are more than five years old.

The median TVPI is 1.53 and the median IRR is 11%. The larger the IRR in absolute value, the more it deviates from a plausible rate of return (due to the reinvestment assumption). We then winsorize IRR at 30%. The average TVPI and IRR are higher than their median due to skewed distributions: the average TVPI is 1.77 and the average IRR is 12.4%.

We follow Hüther (2023) and define as a low-reputation GP, one that does not have any top quartile performing funds older than 5 years (according to Preqin classification). 58% of the funds are run by a GP classified as low-reputation. The average fund duration is 4 years. The median terms align with standard expectations: an 8% hurdle rate, a 20% carry rate, and a 100% catch-up rate. The corresponding averages are slightly lower, at 7.4%, 18.5%, and 91%, respectively.

[Insert Table 2]

[10] Note that RoW Venture Capital is primarily China-focused.

Panel C reports LP characteristics. Each investor's TVPI and IRR are calculated as the weighted average across all their fund holdings, with weights equal to the investor's commitment share in each fund. The distribution of performance is much narrower than at the fund level. For example, the difference in TVPI between the 25th and 75th percentile investors is only 0.25 (1.49 versus 1.74). On average, an investor in our sample holds 2.5% of a given fund.

Panel D reports GP characteristics. The median GP has two funds in the sample, with a total of $400 million invested. At the bottom quartile, GPs have a TVPI below 1.2x and an IRR below 4.6%, while at the top quartile GPs have a TVPI above 1.9x and an IRR above 17.3%. When restricting the sample to GPs with at least 10 funds (156 GPs, managing a quarter of all the funds), the interquartile range becomes much narrower: bottom-quartile GPs have a TVPI below 1.42x, while top-quartile GPs have one above 1.85x.

2.3 Abnormal performance

2.3.1 Notations and Definitions

For each fund i, capital *calls* (cash outflows from investors to the fund) and *distributions* (cash inflows returned from the fund to investors) are represented as $1 \times T$ vectors, denoted by CF_i^- and CF_i^+, respectively. Cash flows are recorded at a daily frequency and span the period from January 2000 to December 2024. The sample comprises $N = 4{,}122$ funds. For each fund, the most recent reported Net Asset Value (NAV) is added as a final distribution. All cash flow values are expressed in U.S. dollars and are net of all fund-level fees and expenses. We use the following benchmark return series, taken from Ken French website:

- R_f: the U.S. risk-free rate, proxied by the one-month Treasury bill rate;
- $Rm^{\text{U.S.}}$: the return on the U.S. equity market (value-weighted);
- Rm^{Dev}: the return on the developed markets equity index (value-weighted).

For any given pricing factor f, we define $M^f \in \mathbb{R}^{T \times 1}$ as the vector of cumulative discount factors derived from f, normalized at the beginning of the sample ($t = 0$). These vectors are used to convert cash flows into present values under various risk adjustment assumptions.

We construct three common measures of risk-adjusted performance.[11] The abnormal

[11] Several alternative methods have been developed in recent years. One that is straightforward to implement in our context is proposed by Hüther, Schmid, and Steri (2023). They develop a pricing model for buyout funds based on five latent factors, $F \in \mathbb{R}^{T \times 5}$, designed to capture macro-financial conditions. These

performance of any investment is obtained by comparing the present value of the distributions with that of the investments. When expressed as a ratio, it is called Public Market Equivalent, by opposition to the difference, which would be a Net Present Value.

For example, the PME as per Kaplan and Schoar (2005) for any fund i (omitting the subscript i) is given by:

$$\text{PME-KS} = \frac{\sum CF_t^+ \cdot M_t^{Rm^{\text{U.S.}}}}{\sum CF_t^- \cdot M_t^{Rm^{\text{U.S.}}}}$$

A PME can also incorporate a beta different from one with respect to the market. The first paper to estimate beta from private equity fund cash flows is Driessen, Lin, and Phalippou (2012). To mitigate idiosyncratic noise at the fund level, they aggregate cash flows by strategy and vintage year. They then apply the Generalized Method of Moments (GMM), using the condition that the net present value (NPV) must equal zero under the correct asset pricing model. Each strategy-vintage combination is treated as a separate moment condition in the estimation.[12]

Selecting an appropriate factor is crucial but difficult. For instance, private debt should naturally exhibit low correlation with equity markets. Using an equity index alone thus results in mechanically low betas and inflated alphas for private debt. A natural remedy is to incorporate additional factors such as high-yield bond returns.[13] However, given the irregularity and noise in fund cash flows, adding more factors with this method is problematic.

An additional complication in our dataset is the presence of funds investing in different countries. If we use the U.S. equity market return as the benchmark, non-U.S. funds will appear to have lower betas and artificially inflated alphas. Conversely, using a developed markets index understates the beta of U.S.-based funds, again distorting alpha estimates. This issue is well known in the asset pricing literature, dating back to early work on the international CAPM (see, e.g., Stulz (1981); Adler and Dumas (1983)).

Given these limitations, we adopt a pragmatic solution. For buyout and other private equity strategies, the sample is approximately 60% U.S. and 40% non-U.S. (Table 2 – Panel A); we use R_m^{dev} as the benchmark. For venture capital, private debt, and real assets, where U.S. funds comprise roughly 80% of the sample, we use $R_m^{\text{U.S.}}$.

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factors collectively define what they refer to as the Capital Market Environment (CME). To preserve space we do not present results using CME but they are available upon request.

[12] It is also necessary to have enough funds in any vintage; we set the minimum number to ten.

[13] See Erel, Flanagan and Weisbach (2024) for an evaluation of private debt performance using both equity and debt market proxies.

For buyout and other private equity funds we then have

$$\text{PME-DLP} = \frac{\sum CF_t^+ \cdot M_t^{Rm^{\text{Dev}}}}{\sum CF_t^- \cdot M_t^{Rm^{\text{Dev}}}}$$

And for venture capital, private debt, and real assets we have

$$\text{PME-DLP} = \frac{\sum CF_t^+ \cdot M_t^{Rm^{\text{U.S.}}}}{\sum CF_t^- \cdot M_t^{Rm^{\text{U.S.}}}}$$

Korteweg and Nagel (2016) propose an approach similar in spirit to Driessen, Lin, and Phalippou (2012), but more firmly rooted in asset pricing theory. They develop the Generalized PME (GPME), which is based on a stochastic discount factor (SDF) calibrated to price public equity and bond returns. Also, unlike traditional PME methods that compute a ratio of discounted present values, GPME computes the difference between discounted inflows and outflows, scaled by the present value of invested capital at the risk-free rate: $S_i = CF_i^- \cdot M^{Rf}$.[14]

Korteweg and Nagel (2025) emphasize that GPME is not suitable for fund-level application and propose a refined framework designed to reduce noise in fund-level estimates. Although their estimator is complex and involves numerous adjustments—making a direct mapping to our notation non-trivial—a slight abuse of notation allows us to express it in a form comparable to our previous formulations:

$$\text{PME-KN}_i = \left(CF_i^+ - CF_i^-\right) \cdot M_i^{KN} \cdot S_i^{-1}$$

PME-KN is estimated separately for each of the five strategies, as is PME-DLP, but for PME-KN we only use the U.S. stock market return as the risk factor.[15]

2.4 Abnormal Performance: Descriptive Statistics

Table 3 Panel A shows the estimated betas for PME-KN and PME-DLP across the five fund strategies. Consistent with prior work, buyout funds have a beta close to unity, venture capital funds a beta closer to two, and private debt funds around 0.5. For these strategies,

[14] Although S_i is highly correlated with the fund size, the two measures differ depending on the timing and magnitude of capital calls.

[15] We also estimated the Korteweg-Nagel beta using developed market returns for buyout and other PE strategies. However, the estimated beta for buyout dropped from 0.84 to 0.26, and for other PE from 1.81 to 0.72.

PME-KN and PME-DLP produce very similar estimates, and in non-tabulated robustness checks we find these results are stable across alternative data filters and empirical choices. For real assets and other private equity, however, PME-KN produces much higher betas than PME-DLP. These discrepancies appear sensitive to sample construction. For example, including vintages from the 1990s lowers the PME-KN beta for real assets to 1.5 — close to the PME-DLP estimate. Similarly, truncating the sample one year earlier (end-2023) also reduces the PME-KN beta for real assets to about 1.5. A comparable sensitivity is observed for other PE funds. The DLP Beta in contrast remains stable across these changes.

Panel B presents the distribution of performance metrics. Median performance lies at or below benchmark across most measures: the median PME-KS is 0.97, PME-DLP is 0.99, and PME-KN is –0.13. Net present value (NPV), reported in millions of dollars, has a median close to zero but with substantial dispersion, reflecting the skewed distribution of outcomes. Overall, these statistics indicate that the typical private capital fund does not generate risk-adjusted outperformance relative to public benchmarks, consistent with earlier findings in the literature.

Panel C breaks down performance by strategy. Buyout funds consistently outperform across all metrics, with a mean PME-DLP of 1.19 and an average NPV of about $139 million. By contrast, venture capital and real assets deliver the weakest performance. Real assets in particular generate the lowest average NPV (–$117 million), while venture capital funds also underperform relative to PME-based benchmarks.

Panel D reports pairwise correlations among performance measures. All PME variants are highly correlated with each other (above 0.75) and display a lower correlation with TVPI_{CF} and NPV (most are around 50%). This relatively low correlation between TVPI and PME underscores the importance of explicitly accounting for differential risk exposures when evaluating private capital fund performance.

[Insert Table 3]

3 Carry Computation

3.1 Main Assumption

An important preliminary question is whether reported Net Asset Value (NAV) should be interpreted as gross or net of carried interest. Conceptually, NAV is the aggregate of estimated market values of portfolio holdings, which suggests it should be measured gross of carry and transaction costs. Empirically, however, Jenkinson, Landsman, Rountree and Soonawalla (2020) show that reported NAVs are typically lower than the sum of subsequent cash flows, implying that fees and transaction costs have already been deducted. Consistent with this, both the academic literature on fund performance and the performance reports used by investors treat NAV as a residual claim *net of fees*. Accordingly, throughout our analysis we assume that reported NAVs are net of carried interest.

3.2 Illustrative Waterfall Provision

Carried interest provisions are set out in the Limited Partnership Agreement (LPA). A simplified version of the distribution "waterfall"—the contractual sequence that governs how profits are allocated between limited partners and the general partner—is as follows:

- **Section A**, to limited partners until distributions to such LP are equal to LP's capital contributions.
- **Section B**, to LP until distributions to such limited partners equal the preferred return.
- **Section C**, 100% to the General Partner until the distributions to the GP equal 20% of all the distributions made pursuant to Section B and Section C.
- **Section D**, 80% for limited partners and 20% for the general partner.

3.3 Derivation of the Carry in Closed-form

The payment under section A is simply what investors have Paid In (PI). The payment under section B is not trivial to compute and we use an approximation here. The total due under section A plus B should be equal to the capital paid in (PI) earning the hurdle rate for the duration of the fund (D). As mentioned above, we do not observe fund duration and use a proxy for duration. We denote the amount due to LPs from section B (LP_b) as PrefR.

Section C (the catch-up) is the most complex one. Let LP_c, GP_c, and T_c denote, respectively, the amounts distributed under Section C to (all the) LPs, to the GP, and in total. By definition, $T_c = \mathrm{LP}_c + \mathrm{GP}_c$ and is not observable. What we observe is TV=LP_a+LP_b+LP_c, i.e. the sum received by the LP.

Second, the GP's share in Section C is the catch-up fraction CU of the total distributed in that section: $\mathrm{GP}_c = \mathrm{CU} \cdot T_c$.

Third, Section C is defined so that, *after* Sections A–C, the GP has received a fraction CR of cumulative *profits*. At the end of Section C, total distributions equal $\mathrm{PI} + \mathrm{PrefR} + T_c$, so profits (distributions net of returned capital PI) are $\text{PrefR} + T_c$. Hence,

$$\text{GP}_c \;=\; \text{CR}\,\big(\text{PrefR} + T_c\big).$$

Together with

$$T_c \;=\; \text{LP}_c + \text{GP}_c \quad \text{and} \quad \text{GP}_c \;=\; \text{CU} \cdot T_c,$$

This system in $(\text{LP}_c, \text{GP}_c, T_c)$ admits the closed-form solution (requiring $\text{CU} > \text{CR}$):

$$\text{GP}_c \;=\; \frac{\text{CU} \cdot \text{CR}}{\text{CU} - \text{CR}}\,\text{PrefR}, \qquad \text{LP}_c \;=\; \frac{(1 - \text{CU}) \cdot \text{CR}}{\text{CU} - \text{CR}}\,\text{PrefR}, \qquad T_c \;=\; \frac{\text{CR}}{\text{CU} - \text{CR}}\,\text{PrefR}.$$

Partial catch-up (waterfall stops inside Section C). The solution above assumes catch-up is completed. If not, the observed net investor distributions, TV, is below the sum of LP distributions that would prevail at the end of Section C, i.e.,

$$\text{TV} \;<\; \text{PI} + \text{PrefR} + (1 - \text{CU})\,T_c^{\star}, \qquad T_c^{\star} = \frac{\text{CR}}{\text{CU} - \text{CR}}\,\text{PrefR}.$$

In the partial catch-up case we have

$$\text{TV} \;=\; \text{LP}_a + \text{LP}_b + \text{LP}_c \;=\; \text{PI} + \text{PrefR} + T_c - \text{GP}_c,$$

so that, $T_c \;=\; \text{TV} + \text{GP}_c - (\text{PI} + \text{PrefR})$

Within Section C the GP receives the catch-up fraction of contemporaneous distributions,

$$\text{GP}_c \;=\; \text{CU} \cdot T_c.$$

Combining the last two equations yields

$$\text{GP}_c \;=\; \frac{\text{CU}}{1 - \text{CU}}\big(\text{TV} - \text{PI} - \text{PrefR}\big),$$

Note that when $\text{CU} = 1$, the expression above is undefined. Intuitively, this is because distributions in Section C are recorded net of carry, thus TV does not reveal where within Section C the process stops. We therefore assume that if CU = 100% the GP fully catches up (the waterfall reaches Section D). This convention has negligible quantitative impact but is required for identification.

3.4 Example of Carry Calculation with 100% catch up

Assume that LPs contributed a total of \$100 on January 1, 2020 (all fees included) and the value distributed (post-carry) on December 31, 2021, that is, two years later, is \$200. The hurdle rate is 8% per year and carry rate is 20%. Results are summarized in Table 4.

- **Section A** is straightforward and stipulates that LPs receive \$100.
- **Section B** requires the computation of the preferred return. This is a two-year investment at 8% per year. Therefore,

  $$\text{PrefR} = 100 \times (1 + 0.08)^2 = 116.64.$$

  As section A generates \$100 for LPs, section B generates \$16.64 for the LPs.
- **Section C**. The above equation provides a closed-form formula for this amount:

  $$\text{GP}_c = \frac{0.2 \times 1}{1 - 0.2} \times (116.64 - 100) = \frac{16.64}{4} = 4.16.$$

  We can double check that this computation is correct. With a carry of \$4.16, the GP has received 20% of the total of Sections B and C:

  $$\frac{4.16}{16.64 + 4.16} = 20\%.$$
- **Section D** simply splits what is left between LPs and the GP on an 80%-20% basis. From the closed-form formula:

  $$\text{GP}_d = \frac{0.2}{0.8} \times (200 - 116.64) = 20.84.$$

  LPs thus receive four times this amount: \$83.36.

We can verify that the LP has received 200 in total (116.64 + 83.36).

In this simple example, the carried interest of \$25 in total (Sections C and D) would be fully realized if all assets had been sold and distributed at this point. In practice, part of a fund's value may still be held as NAV. The portion of carry corresponding to distributed proceeds is the realized carry, while the portion attached to residual NAVs represents unrealized carry. As discussed below, we cannot decompose these two amounts empirically because the carry basis is unobserved. Economically, however, their sum is probably what is most relevant.

[Insert Table 4]

3.5 Empirical Validation

To illustrate the methodology, we provide a worked example using Apollo Investment Fund VI, which is approaching the end of its life. Apollo is the only firm that publicly discloses since-inception carry for some of its funds, making it a useful benchmark. According to Preqin, Apollo VI was raised in 2006 with a fund size of \$10.1 billion. The fund has called 128.7% of committed capital, reports a net IRR of 8.65%, and a TVPI of 1.51. Preqin lists a carry rate of 20% and a hurdle rate of 8%; the catch-up rate is not reported. We impute a 100% catch-up, the median for North American buyout funds launched in the 2000s. The implied duration is computed as:

$$\frac{\ln(1.51)}{\ln(1+8.65\%)} = 5 \text{ years.}$$

The preferred return in the Carry waterfall is thus:

$$10.1 \times 128.7\% \times (1+8\%)^5 = 19.$$

As IRR is larger than the Hurdle Rate, we then have:

$$TV = 10.1 \times 128.7\% \times 1.51 = 19.61$$

$$GP_c = (19-13) \times \frac{1 \times 0.2}{1-0.2} = 1.5$$

$$LP_c = 0$$

$$GP_d = (19.61-19) \times \frac{0.2}{0.8} = 0.15$$

$$Carry = 1.5 + 0.15 = 1.65$$

Let us verify that this is correct: Net of Carry, this fund distributed $10.1 \times 1.287 \times 1.51 = 19.6$. Hence before Carry, if the full 1.67 Carry had been charged, the total distributed would have been $19.6 + 1.67 = 21.3$. The total called is 13, thus the profit is 8.3. Twenty percent of the profit is 1.67, which is indeed the full Carry. The figure reported by Apollo is 1.66 for what they call “performance fees since inception distributed by fund and recognized” (page 72 of their 2023 10-K filing). In addition, they report an undistributed Carry of 0.022, making the total Carry 1.68. For the four flagship funds of Apollo, our estimated Carry is \$9.36 billion (total). Apollo reports a total of \$9.44 billion.

3.6 Discussion of Carry Computation

We define *Total Carry* as the sum of realized carry already distributed to GPs and unrealized carry that would be owed if funds were liquidated at the latest reported NAV. Including unrealized carry is important because it represents a liability of LPs: investors currently owe this amount to fund managers.[16]

Our baseline assumption is that carry is triggered when the net IRR exceeds the hurdle rate. Funds with net IRR below their HR are assumed to have no carry. This is a conservative assumption.[17]

We do not distinguish between American and European waterfall structures. The key difference between the two lies in the timing of payments, not in their total amount. Because our focus is on aggregate carry in dollar terms, and we abstract from discounting, this distinction has minimal impact on results.[18]

Several other simplifying assumptions are necessary. We assume that reported multiples are the same in U.S. dollars as in the fund currency, implicitly treating exchange rate fluctuations as offsetting over the life of the fund. We abstract from recycling provisions, margin lending, and other contractual features that may affect reported TVPI. We treat Paid-In Capital (PI) as the total amount invested.

Duration is imputed under the simplifying assumption of no interim cash flows. Because most funds do have intermediate distributions, the effective duration may be shorter than our measure, which implies that the preferred return threshold is slightly overstated and total carry is slightly understated. To limit potential bias, we cap imputed duration at five years. In practice, duration assumptions have little impact on aggregate estimates.

Finally, our results are robust to alternative assumptions regarding hurdle rates and catch-up provisions. Varying these parameters produces only minor changes in the estimated amount of total carry.

[16] NB: publicly traded private capital firms report both realized and unrealized carry in financial statements.

[17] With an American-style waterfall, carry is typically computed deal-by-deal. A fund may have a net IRR below 8%, yet exited deals may have much higher IRRs. In such cases, early carry payments could later be clawed back if the fund ultimately underperforms. Our assumption that all funds with IRR below 8% earn no carry is therefore conservative. In addition, the hurdle should ideally be compared to IRR gross of carry (but net of other fees). Using net IRR slightly underestimates carry.

[18] We also do not adjust for inflation, even though some payments date back more than 20 years.

4 Empirical Analysis

4.1 Effective Carry and the Distribution of Fund Performance

Incentive fees in private equity, like in hedge funds, are non-linear. Because investors cannot offset gains and losses across funds, aggregate profits from a portfolio of funds may imply an effective carry rate (carry divided by profit) that differs from the contractual rate. In hedge funds, this effect is amplified by two mechanisms: investors can redeem from underperforming funds, and managers can liquidate them, thereby eliminating fee credits from past losses (Ben-David, Birru, and Rossi (2023)). Neither mechanism is available in private equity, where funds are closed-end vehicles and clawback provisions apply.

As a result, discrepancies between the nominal carry rate (typically 20%) and the effective rate in private equity arise solely from the distribution of fund performance. To illustrate, we set up a deterministic grid of portfolio compositions with two types of funds. This illustration is not a stochastic simulation. We simply fix the share of "winning" funds and assign each winning fund a specific TVPI value while the remainder lose all invested capital. There is therefore no assumed data-generating process, or correlation structure across funds. The table simply reports the implied effective carry under these mechanical proportions. Type A funds are winners, generating a TVPI between 1.2 and 3.8. Type B funds lose all invested capital. For each scenario, the effective carry is computed as total carry paid divided by total profit, where profit equals the difference between distributions and invested capital.

Results, shown in Table 5, highlight how performance distribution shapes outcomes. The proportion of Type A funds varies along the vertical axis. In the bottom-right corner of the table, where nearly all funds are winners, the effective carry converges to 25%. Near the diagonal, effective carry can exceed 100%, indicating that investors paid more in carry than they earned in profit. Negative values reflect situations where carry is charged despite negative overall profits. For example, if 30% of funds are winners with a TVPI of 3.2, then $30 invested in winners grows to $96 pre-carry. The GP earns 20% of the $66 profit, or $13.2. The remaining $70 invested in losing funds is lost, leaving the investor with $82.8 on a $100 investment. The investor thus records a $17.2 loss, while still paying $13.2 in carry. Thus, the effective rate of –77%.[19]

[Insert Table 5]

[19]This example also underscores the importance of defining profits precisely. Ben-David, Birru, and Rossi (2023) define profits in hedge funds as capital exceeding the hurdle rate. In private equity, because of the catch-up mechanism, we measure carry against nominal profits (distributions minus invested capital).

4.2 Descriptive Statistics

Table 6 reports total carry by strategy and region. For each group, we show total dollars invested, the aggregate TVPI, the share of funds in-the-carry (IRR above the hurdle), the carry-to-profit ratio, and the implied total carry. Statistics are presented for the five broad strategies and split between U.S. and non-U.S. funds.

In dollar terms, U.S. buyouts dominate with $1.9 trillion invested, followed by U.S. real assets at $1.5 trillion. The smallest cell is non-U.S. venture capital ($111 billion). Consistent with the literature, buyouts post the highest TVPIs, while the weakest performance appears in non-U.S. private debt (TVPI = 1.33) and in real assets (TVPI below 1.4 in both regions).

The scale of aggregate carry is economically large. The estimated total exceeds $1 trillion—combining realized amounts with carry implied by current NAVs—and is concentrated in a handful of strategy–region cells. 70% of the carry pool is earned by U.S.-focused funds. The rest of the world only captures 30%. More than half of the carry pool accrues to leveraged buyouts, while venture capital accounts for less than $100 billion ($<$ 10% of the total). This composition matters for policy: favorable tax treatment of carry is often justified by its role in venture formation, yet venture represents a small share of the aggregate.

Nearly four in five buyout funds are in-the-carry (76–79%), and their carry-to-profit ratio is about 19%. Venture funds are in-the-carry less often (64–70%) yet exhibit a slightly higher carry share (20%), reflecting lower or zero hurdles in VC contracts. In non-U.S. private debt, only about half the funds are in-the-carry, but the carry-to-profit ratio is still 15%. Non-U.S. real assets show a similar pattern: fewer than half in-the-carry, with a carry-to-profit ratio near 18%. Overall, effective rates cluster tightly across categories despite differences in headline terms, performance dispersion, and average TVPI.

Aggregating across all strategies and regions, carry absorbs 18% of investor profits, remarkably close to the value-weighted contractual rate of 19% (non-tabulated).[20] Thus, unlike in hedge funds, where effective and contractual rates diverge sharply (Ben-David, Birru, and Rossi (2023)), in private markets the two line up closely. This alignment reflects both the relatively smooth distribution of fund outcomes and contractual features (closed-end funds, hurdles and clawback).

That said, even with smooth distributions within strategy–region cells, investors can choose mixes of strategies and regions that tilt realized carry above or below contractual rates. We turn to this composition channel next by examining the effective carry rates paid by LPs.

[20] Profits are defined as distributions minus invested capital, without risk adjustment.

[Insert Table 6]

4.3 A Functional Taxonomy of Limited Partners

An important hypothesis we propose to test is whether LPs pay an effective carry that exceeds the contractual 20%—or even 30%—of their profits. In other words, do some LPs select portfolios that place them closer to the diagonal in Table 5?

To address this, we classify LPs into six categories: public and private pensions, asset managers, endowments, foundations, and captive investors. This taxonomy aims to capture meaningful differences in governance, capital sources, and investment mandates. Public and private pensions differ in their regulatory oversight, funding stability, and liquidity needs. Asset managers operate as intermediaries, raising and deploying external capital, often with incentives that diverge from those of direct investors. Endowments and foundations are both perpetual and tax-exempt, but differ in mandate: endowments serve institutional missions, while foundations pursue philanthropic goals. Captive investors—including insurers, sovereign funds, and family offices—invest proprietary capital, with unified ownership and governance structures.

4.4 The Distribution of Carry Across Limited Partner Types

Table 7 reports descriptive statistics by LP category. The number of observations is balanced across groups: between 582 and 717 LPs for private pensions, public pensions, and foundations, and roughly half as many for endowments (326) and captive investors (390). Thus, all major LP categories are well represented in the sample. Across types, performance metrics such as TVPI and PME are strikingly similar. This finding contrasts with the earlier literature—based on smaller and older datasets—which reported significant differences in realized returns across investor types.

In contrast, the share of profits absorbed by carry does vary, although not dramatically. Asset managers face the highest effective rates: on average, 18.4% of profits, with nearly 5% of them paying more than 25%. Similarly, 3% of captive investors pay in excess of 25%. At the other end of the spectrum, about 1% of public pensions pay more than 25%. Importantly, the fraction of funds "in the carry" is comparable across LP types, confirming that these cross-sectional differences are unlikely to be explained by variation in performance.

This table also highlights systematic differences in LP characteristics. Asset managers and captive investors—the two groups with the highest effective carry—are disproportionately non-U.S.-based. Whereas 77% of private pensions and more than 95% of foundations and endowments are U.S.-based, only 33% of asset managers and 39% of captives are. Consistent with this, these two groups allocate less to U.S. funds and more to non-U.S. opportunities, typically splitting their portfolios roughly evenly between the two regions. They also invest more heavily in venture capital and in "other PE" strategies.

To assess whether these compositional differences explain variation in effective carry, we estimate regressions of LP-level relative carry (Carry/Profit) on performance and investor characteristics (Table 8). After controlling for a first set of LP characteristics, we find that public pensions and endowments pay lower carry relative to profits than other LPs, while asset managers and captive investors pay significantly more. However, once we account for exposure to "other PE" funds, the excess carry burden of asset managers and captives disappears. This pattern is consistent with the fact that these groups rarely invest in FoFs (asset managers because they manage them, captives because they rely more on direct allocations), and FoFs typically apply lower carry rates. By contrast, endowments and, to a lesser extent, public pensions—continue to pay systematically lower relative carry even after conditioning on portfolio composition. This suggests that their lower carry incidence reflects portfolio structures.[21]

[Insert Tables 7 and 8]

4.5 Carry and Subsequent Fund Performance

We now turn to the dynamic relation between carry and subsequent fund performance. Two competing hypotheses motivate this analysis. The first is the "Too Rich Too Soon" effect of Kadan and Swinkels (2008), who show that large early payoffs can distort managerial incentives by lowering marginal effort or inducing negative-NPV risk-taking. In private equity, this would imply that GPs earning unusually high carry in fund N might underperform in their follow-on fund $N+1$.

The second hypothesis is derived from Berk and van Binsbergen (2015). In the mutual fund industry, they demonstrate that compensation is most strongly related to subsequent *value-added*, defined as gross abnormal returns multiplied by assets under management. This framework predicts that past compensation (here, carry) should be positively related to subsequent fund performance, but only when performance is measured in absolute terms such as NPV rather than in relative terms such as PME.

[21] TVPI is used as the performance measure, but results are robust to alternative performance metrics.

The regression results, reported in Table 9, provide several insights. First, we find no support for the "Too Rich Too Soon" hypothesis. On the contrary, the relationship between past carry and subsequent performance is positive, not negative. GPs who earned more carry in prior funds subsequently deliver stronger performance, even after controlling for past performance itself. This finding is consistent with Berk and van Binsbergen's prediction that compensation contains information about managerial quality that is revealed in future performance.

Second, the strength of the relationship depends on the choice of performance metric. Scaled abnormal performance measures such as PME-KS, PME-DLP, and especially PME-KN exhibit a strong and statistically significant correlation with past carry. By contrast, the relationship with NPV is positive but considerably weaker. This pattern stands in partial contrast to Berk and van Binsbergen (2015) result for mutual funds, where absolute value-added (akin to NPV) is the metric most tightly aligned with compensation. In private equity, it appears that scaled abnormal performance better captures persistent skill, while absolute NPV may be noisier.

These results must be interpreted in light of the overlapping-fund critique (Phalippou (2010)). Fund $N + 1$ typically begins investing before fund N is liquidated, meaning that carry in fund N is not fully realized when new investments occur. This timing overlap can mechanically induce spurious persistence in both performance and compensation. To address this, we re-estimate the regressions requiring a minimum five-year gap between the vintage years of fund $N - 1$ and fund N (Table 9, Panel B). When overlap is minimized, the link between past carry and performance disappears completely when performance is measured by TVPI or NPV. However, the effect remains remarkably strong across all PME-based measures, with PME-KN in particular continuing to show a robust positive relationship.

The contrast between Panels A and B is revealing. In the full sample with overlapping funds, we replicate the well-documented persistence in private equity fund performance. However, this persistence largely vanishes once overlap is reduced. What remains is a strong and robust relationship between past carry and abnormal performance measured by PME. In other words, past compensation appears to be a better predictor of future returns than past returns.

Taken together, these findings yield three main conclusions. First, the "Too Rich Too Soon" hypothesis does not hold in our data: high prior compensation does not lead to underperformance. Second, consistent with Berk and van Binsbergen (2015), compensation is informative about future performance, but in private equity this is true for scaled abnormal returns (PME) rather than for absolute NPV. Third, once fund overlap is accounted for, performance persistence disappears but past carry remains predictive. This suggests that carry contains unique information about GP quality or organizational capability.

[Insert Table 9]

4.6 The Distribution of Carry Across GPs

At the GP level, we find a robust positive correlation between performance and carry (Table 10). This result holds across all performance measures, including risk-adjusted ones. Carry is also strongly correlated with GP size, implying powerful incentives for managers to grow assets under management. Taken together, these patterns highlight the trade-off faced by GPs: while larger fund size increases the absolute dollar amount of carry, it may come at the expense of performance. Our estimates can be interpreted as calibrating the strength of this trade-off in practice.

In unreported results, we also examine *relative carry*—defined as carry divided by total profits. Here too we find a positive association with abnormal performance, suggesting that GPs with stronger performance are rewarded not only with larger fund size but also with a higher effective share of profits. These findings connect to Robinson and Sensoy (2013), who report little systematic relation between fee levels and net-of-fee returns.

[Insert Table 10]

4.7 Survivorship Bias & Missing Funds

Survivorship bias has received limited attention in the private equity literature. The leading datasets used in academic research (Preqin, Burgiss, PitchBook) are primarily assembled from LP disclosures and are intended to include all funds to which those LPs committed capital. As a result, survivorship is generally viewed as less severe than in mutual or hedge fund settings, where selective reporting and fund closures are common. PE managers cannot easily merge away poor performers or erase track records.

That said, some bias can arise. Data vendors backfill historical records and, in some cases, receive information directly from GPs, which raises the risk of selection on quality. Consistent with this view, recent work (Brav, Lakan and Yafeh (2023); Andonov, Hochberg, and Rauh (2018); Andonov, Rauh, and Kräussl (2021)) shows that Preqin tends to overweight larger and better-performing funds.

To evaluate how such selection might affect our results, we predict performance for the universe of funds without reported TVPI. We estimate a model on the subsample with complete data that maps TVPI to vintage year, strategy, geography, and fund size, and then use the fitted coefficients to predict TVPI for 27,446 funds that lack TVPI but have these characteristics. These funds account for \$5.3 trillion of invested capital; their median predicted TVPI is 1.58.

As Brav, Lakan and Yafeh (2023) document that missing funds in Preqin tend to underperform, we apply conservative downward adjustments to the predicted TVPI in 2.5% increments up to a 10% total reduction. We then translate the (possibly discounted) predicted TVPI into carry for each missing fund using the fee terms imputation described earlier (carry rate, hurdle, catch-up at the relevant strategy/region medians) and our waterfall rules. The implied carry for the missing segment ranges from \$532 billion (no discount) to \$408 billion (10% discount). The carry-to-profit ratio for this segment rises slightly as predicted performance is reduced, because both profits and carry decline, but the former falls proportionally more (see Table 11).

Two implications follow. First, even pessimistic assumptions for the missing funds do not overturn our baseline inferences: the carry-to-profit ratio is little affected because both numerator and denominator move in tandem. Second, combining the baseline estimate for the in-sample funds (just over \$1 trillion) with the predicted range for the missing segment implies an aggregate between roughly \$1.4 and \$1.5 trillion.

[**Insert Table 11**]

Finally, to assess both potential clawback exposure and sensitivity to NAV accuracy, we recompute total carry after applying proportional haircuts to fund-level NAVs. For each fund, we replace NAV with $(1-h) \cdot NAV$ for $h \in \{0.10, 0.25, 0.50, 0.90\}$, recompute TVPI, and re-evaluate the waterfall (Sections A–D). Figure 1 plots aggregate carry as a function of h. The profile is monotone and convex: modest haircuts (e.g., 10–25%) have limited impact; beyond 50%, reductions accelerate as more funds cross the hurdle and trigger clawback. Under an extreme 90% write-down — well beyond plausible stress — about half of total carry is eliminated. Cross-sectionally, sensitivity is greatest for strategies/vintages with higher residual NAV (e.g., more recent vintages, real assets and venture capital). These stress tests indicate that while valuation error can move levels, the order of magnitude of aggregate carry is robust; large totals arise from many funds being in-the-carry on a substantial capital base, not from fragile valuation assumptions.

5 Conclusion

This paper provides the first quantification of carried interest in private markets and links realized compensation to performance, scale, and portfolio composition. We estimate where funds sit in the waterfall and aggregate the dollar value of carry—realized to date plus amounts implied by reported NAVs. The total exceeds one trillion dollars. The effective share of profits absorbed by carry is about 18%. The narrow gap to contractual carry rate reflects both the bite of hurdle rates and the comparatively smooth distribution of fund outcomes in private equity relative to settings with greater path-dependence as hedge funds.

More than half of aggregate carry accrues to leveraged buyouts; venture capital accounts for less than ten percent of the total. This composition matters in debates over the taxation of carry—often framed in terms of venture formation—and in broader discussions about the size of financial intermediation and top-income dynamics. While we take no normative stance on tax design, our quantification provides orders of magnitude useful for policy calibration.

Naturally, limitations remain. We do not observe the carry basis and therefore cannot decompose realized versus unrealized amounts; we assume reported NAVs are net of carry; and we abstract from certain contractual frictions (e.g., currency effects, recycling, subscription lines) that can influence TVPI. Data coverage is incomplete, which biases totals downward. Conversely, backfilling and partial GP-sourced records can bias extrapolations upward. However, we show that the ratio of carry to profit is robust to adjustment choices.

References

Adler, M., and Dumas, B., 1983, "International Portfolio Choice and Corporation Finance: A Synthesis," *The Journal of Finance* 38, 925-984.

Ang, A., Chen, B., Goetzmann, W.N., and Phalippou L., 2018, "Estimating Private Equity Returns from Limited Partner Cash Flows," *The Journal of Finance* 73, 1751–1783.

Andonov, A., Hochberg, Y.V., and Rauh, J.D., 2018, "Political Representation and Governance: Evidence from the Investment Decisions of Public Pension Funds," *The Journal of Finance* 73, 2041-2086.

Andonov, A., Rauh, J.D., and Kräussl, R., 2021, "Institutional Investors and Infrastructure Investing," *The Review of Financial Studies* 34(8), 3880–3934.

Barrios, J.M., and Hochberg, Y.V., 2021, "Taxing Carried Interest as Ordinary Income and the Potential Impact on New Venture Fund Formation."

Ben-David, I., Birru, J., and Rossi, A., 2023, "The Performance of Hedge Fund Performance Fees."

Berk, J.B., and van Binsbergen, J.H., 2015, "Measuring Managerial Skill in the Mutual Fund Industry," *Journal of Financial Economics* 118, 1–20.

Berk, J.B., and van Binsbergen, J.H., 2015, "Measuring Managerial Skill in the Mutual Fund Industry," *Journal of Financial Economics* 118, 1–20.

Erel, I., Flanagan, T., and Weisbach, M.S., 2024, "Risk-Adjusting the Returns to Private Debt Funds," *Fisher College of Business Working Paper*

Brav, A., Lakan, G., and Yafeh, Y., 2023, "Private Equity and Venture Capital Fund Performance: Evidence from a Large Sample of Israeli Limited Partners," *European Corporate Governance Institute – Finance Working Paper*

Catherine, S., Miller, M., and Sarin, N., 2025, "Social Security and Trends in Inequality," *The Journal of Finance* 80, 1497-1531.

Cen, X., Dou, W.W., Kogan, L., and Wu, W., 2024, "Fund Flows and Income Risk of Fund Managers," *Jacobs Levy Equity Management Center for Quantitative Financial Research Paper, The Wharton School Research Paper* .

Driessen, J., Lin, T.-C., and Phalippou, L., 2012, "A New Method to Estimate Risk and Return of Nontraded Assets from Cash Flows: The Case of Private Equity Funds," *Journal of Financial and Quantitative Analysis* 47(3), 511-535.

Gompers, P., and Josh, L., 1999, "An Analysis of Compensation in the U.S. Venture Capital Partnership," *Journal of Financial Economics* 51, 3–44.

Greenwood, R., and David, S., 2013, "The Growth of Finance," *The Journal of Economic Perspectives* 27, 3–28.

Hüther, N., Robinson, D.T., Sievers, S., and Hartmann-Wendels, T., 2020, "Paying for Performance in Private Equity: Evidence from Venture Capital Partnerships," *Management Science* 66, 1756–1782.

Hüther, N., 2023, "Do Private Equity Managers Raise Funds on (Sur)real Returns? Evidence from Deal-Level Data," *Journal of Financial and Quantitative Analysis* 58(7), 2959-2992.

Hüther, N., and Schmid, L. and Steri, R., 2023, "Credit Market Equivalents and the Valuation of Private Firms," *USC Marshall School of Business Research Paper*

Imparato, D., 2024, "Private Equity's Byzantine Tax Stand—An Untold and New Story of Carried Interest," *British Tax Review.*

Ivashina, V., and Lerner, J., 2019, "Pay Now or Pay Later? The Economics within the Private Equity Partnership," *Journal of Financial Economics* 131, 61–87.

Jenkinson, T., Landsman, W.R., Rountree, B., and Soonawalla, K., 2020, "Private Equity Net Asset Values and Future Cash Flows," *The Accounting Review* 95, 191–210.

Kadan, O., and Swinkels, J.M., 2008," Stocks or Options? Moral Hazard, Firm Viability, and the Design of Compensation Contracts," *The Review of Financial Studies* 21(1), 451–482.

Kaplan, S.N., and Schoar, A., 2005, "Private Equity Performance: Returns, Persistence, and Capital Flows," *The Journal of Finance* 60, 1791-1823.

Kaplan, S.N., and Joshua, R., 2013, "It's the Market: The Broad-based Rise in the Return to Top Talent," *The Journal of Economic Perspectives* 27, 35–55.

Korteweg, A., and Nagel, S., 2016, "Risk-Adjusting the Returns to Venture Capital," *The Journal of Finance* 71, 1437–1470.

Korteweg, A., and Nagel, S., 2025, "Risk-Adjusted Returns of Private Equity Funds: A New Approach," *Review of Financial Studies* 38, 2557–2601.

Metrick, A., and Yasuda, A., 2010, "The Economics of Private Equity Funds," *The Review of Financial Studies* 23, 2303–2341.

Neidle, D., 2023, "Carried Too Far? A Challenge to the Tax Treatment of Carried Interest in the Private Equity Industry," *British Tax Review*, 22–43.

Phalippou, L., and Gottschalg, O., 2009, "The Performance of Private Equity Funds," *Review of Financial Studies* 22, 1747–1776.

Phalippou, L., 2010, "Venture capital funds: Flow-performance relationship and performance persistence," *Journal of Banking & Finance* 34(3), 568-577

Philippon, T., 2015, "Has the U.S. Finance Industry Become Less Efficient? On the Theory and Measurement of Financial Intermediation," *The American Economic Review* 105, 1408–1438.

Phalippou, L., Rauch, C., and Umber, M., 2018, "Private equity portfolio company fees," *Journal of Financial Economics* 129(3), 559-585.

Piketty, T., and Zucman, G., 2014, "Capital is Back: Wealth-income Ratios in Rich Countries 1700–2010," *The Quarterly Journal of Economics* 129, 1255–1310.

Robinson, D.T., and Sensoy, B.A., 2013, "Do Private Equity Fund Managers Earn Their Fees? Compensation, Ownership, and Cash Flow Performance," *The Review of Financial Studies* 26, 2760–2797.

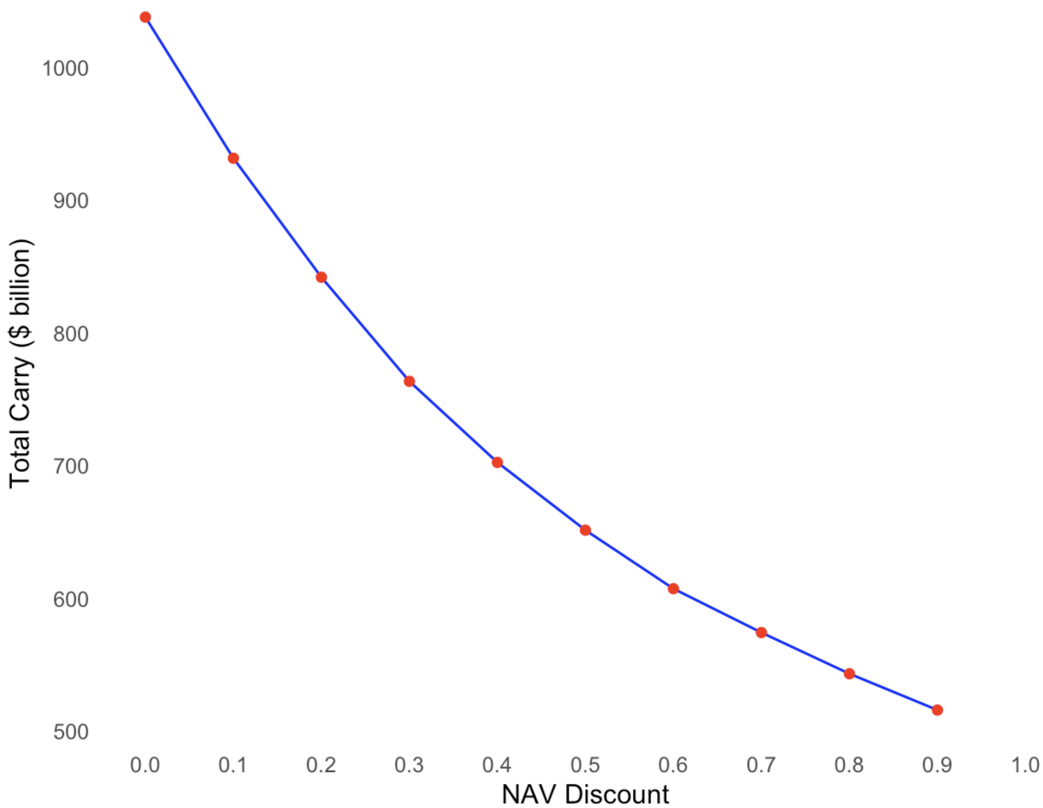
Saez, E., and Zucman, G., 2016, "Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data," *The Quarterly Journal of Economics* 131(2), 519–578.

Stulz, R.M., 1981, "On the Effects of Barriers to International Investment," *The Journal of Finance* 36, 923-934.

Utke, S., 2024, "There is No Carried Interest Loophole."

Zingales, L., 2015, "Presidential Address: Does Finance Benefit Society?," *The Journal of Finance* 70, 1327–1363.

Figure 1: Total carry as a function of the final value of unrealized investments



Notes: The graph shows the total carry that would result from a reduction in NAV. Total carry is recomputed assuming a lower NAV and thus a lower TVPI. The hurdle amount (HA) is unchanged.

Table 1: Summary Statistics – Key Fee Terms

Panel A: Carry Rate (CR)

Strategy	Region	Vintage	Size	N_obs	Median CR
Fund of Funds	Europe	2000s	All	64	10.0
Fund of Funds	Europe	2010s	All	36	9.0
Fund of Funds	RoW	2000s	All	14	10.0
Fund of Funds	RoW	2010s	All	22	10.0
Fund of Funds	U.S.	2000s	All	104	10.0
Fund of Funds	U.S.	2010s	All	136	10.0
RE Fund of Funds	Non_US	All	All	17	10.0
RE Fund of Funds	U.S.	All	All	25	12.0
Secondaries	Non_US	All	All	25	12.5
Secondaries	U.S.	2000s	All	20	10.0
Secondaries	U.S.	2010s	Large	12	12.5
Secondaries	U.S.	2010s	Mid-mkt	22	18.8

Panel B: Hurdle Rate

Strategy	Region	Vintage	Size	N_obs	Median HR
Early Stage	Europe	2000s	All	12	6.0
Early Stage	Europe	2010s	All	45	8.0
Early Stage	RoW	All	All	115	6.0
Early Stage	U.S.	2000s	All	37	0.0
Early Stage	U.S.	2010s	All	58	0.5
Venture (General)	Europe	2000s	All	22	7.0
Venture (General)	Europe	2010s	All	51	7.0
Venture (General)	RoW	2000s	All	33	8.0
Venture (General)	RoW	2010s	All	283	5.0
Venture (General)	U.S.	2000s	All	51	0.0
Venture (General)	U.S.	2010s	All	76	8.0
RE Opp / V-Add	Europe	2000s	All	22	9.0
RE Opp / V-Add	Europe	2010s	All	48	8.0
RE Opp / V-Add	RoW	2000s	All	32	9.5
RE Opp / V-Add	RoW	2010s	All	61	10.0
RE Opp / V-Add	U.S.	2000s	All	61	9.0
RE Opp / V-Add	U.S.	2010s	Large	27	8.0
RE Opp / V-Add	U.S.	2010s	Mid-mkt	228	8.0

Notes: Panel A reports carry rates (CR) for fund categories with a median different from the industry standard of 20%. Panel B reports hurdle rates (HR) for Early-Stage, General VC, and Real Estate Opportunistic and Value-Add. RoW denotes all countries outside U.S./Canada (U.S.) and Europe (including the UK and Scandinavia).

Table 2: Descriptive Statistics

Panel A: Distribution of funds across investment strategy and geography

	Buyout	Venture Capital	Private Debt	Real Assets	Other PE
U.S.	1,306	1,255	955	2,493	1,841
Europe	692	358	274	725	726
RoW	213	494	81	245	479
Total	2,211	2,107	1,310	3,463	3,046

Panel B: Fund Characteristics

	Mean	25th Percentile	Median	75th Percentile
Size ($ mn)	663.04	104.00	252.80	619.92
Sequence	2.83	1.00	2.00	4.00
Capital Called (%)	95.33	90.40	97.68	100.00
TVPI	1.77	1.22	1.53	1.96
IRR (%)	12.43	5.47	11.20	18.50
Low-reputation (1/0)	0.58	0.00	1.00	1.00
Duration (years)	4.05	3.29	4.12	5.11
Hurdle Rate (%)	7.38	8.00	8.00	8.00
Carry Rate (%)	18.52	20.00	20.00	20.00
Catch Up Rate (%)	90.69	90.00	100.00	100.00

Panel C: LP Characteristics (3,152 LPs)

	Mean	25th Percentile	Median	75th Percentile
Number of PE funds	33.92	7.00	13.00	31.00
Exposure (commitment/fund size)	2.51	1.18	1.83	2.38
TVPI	1.62	1.49	1.61	1.74
IRR (%)	11.61	9.28	11.84	14.03

Panel D: GP Characteristics (3,524 GPs)

	Mean	25th Percentile	Median	75th Percentile
Number of PE funds	3.44	1.00	2.00	4.00
GP size ($ mn)	2334	135	406	1325
GP age (years)	8.29	2.00	6.00	13.00
TVPI	1.69	1.21	1.54	1.94
IRR (%)	10.18	4.60	10.78	17.27

Notes: The 12,137 funds in the working sample are categorized into five groups based on Preqin's primary strategy classification: Buyout, Venture Capital, Private Debt, Real Assets, and Other Private Equity (including secondaries, growth capital). All the variables are defined in the text.

Table 3: Measures of Fund Performance

Panel A: Estimated Betas

	Buyout	Venture Capital	Private Debt	Real Assets	Other PE
PME-KN	0.84	2.40	0.43	2.66	1.81
PME-DLP	1.05	1.93	0.45	1.48	1.09

Panel B: Summary Statistics

Metric	25th pctile	Median	75th pctile	St. Dev.
$TVPI_{CF}$	1.26	1.56	1.96	0.73
PME-KS	0.78	0.97	1.17	0.39
PME-KN	-0.31	-0.13	0.09	0.40
PME-DLP	0.73	0.99	1.22	0.42
NPV	-88	-6	59	433

Panel C: Average by Fund Strategy

Strategy	$TVPI_{CF}$	PME-KS	PME-KN	PME-DLP	NPV
Buyout	1.81	1.12	0.15	1.19	138.5
Venture Capital	1.72	0.96	-0.32	0.73	-9.45
Private Debt	1.43	0.94	0.14	1.14	-60.18
Real Assets	1.40	0.87	-0.34	0.75	-116.71
Other PE	1.87	1.06	-0.14	1.15	33.35

Panel D: Pairwise Correlations

	PME-KS	PME-DLP	PME-KN	NPV
$TVPI_{CF}$	0.79	0.71	0.52	0.40
PME-KS	1.00	0.91	0.78	0.57
PME-DLP		1.00	0.84	0.53
PME-KN			1.00	0.51

Notes: All performance metrics are computed using the 4,122 funds with cash flow data in Preqin. The subscript "CF" for TVPI indicates that this variable is calculated only for the subsample of funds with cash flows. See text for definitions of each performance measure. Panel A shows Beta estimates. Panel B reports distributional statistics for all the metrics. Panel C shows average values by fund strategy. Panel D presents pairwise correlations across performance metrics. All variables are winsorized at the 1st and 99th percentiles. NPV is reported in millions of USD.

Table 4: Carry Waterfall

	LP	GP
Section A	100.00	0.00
Section B	16.64	0.00
Section C	0.00	4.16
Section D	83.36	20.84

Notes: Example of a carry waterfall (sections A to D, see text), assuming that LPs contributed a total of $100 on January 1, 2020 (all fees included) and the value distributed (pre-carry) on December 31, 2021, that is, two years later, is $200. The hurdle rate (HR) is 8% per year and carry rate is 20%.

Table 5: Effective carry as a Function of the Performance Distribution

	1.2	1.4	1.8	2.2	2.4	2.8	3.2	3.4	3.8
10%	0%	-1%	-2%	-3%	-4%	-5%	-6%	-7%	-8%
20%	-1%	-2%	-5%	-8%	-10%	-14%	-20%	-23%	-32%
30%	-2%	-4%	-9%	-17%	-23%	-40%	-77%	-116%	-600%
40%	-3%	-7%	-19%	-44%	-74%	-600%	169%	114%	76%
50%	-5%	-12%	-44%	-600%	233%	82%	58%	52%	45%
60%	-8%	-23%	-600%	82%	62%	47%	40%	38%	36%
70%	-15%	-74%	76%	45%	40%	36%	33%	32%	31%
80%	-44%	114%	41%	34%	32%	30%	29%	29%	28%
90%	82%	38%	30%	28%	28%	27%	27%	27%	26%
100%	25%	25%	25%	25%	25%	25%	25%	25%	25%

Notes: Each cell reports the effective carry, defined as total carry divided by total profit. The rows represent the share of winning funds in a portfolio; the columns indicate the TVPI of those winners. Remaining funds return zero. We assume a 20% carry, no hurdle, and full catch-up. Cells shaded in gray reflect cases where the effective carry rate exceeds 50%. Values below zero indicate that carry was paid despite net investor losses.

Table 6: Carry across fund strategies and geographies

Asset class	Region	Invested	TVPI	% in Carry	Carry/Profit	Total Carry
Buyout	U.S.	1,881	1.83	76%	19%	358
	Non-U.S.	1,181	1.70	79%	19%	197
Venture Capital	U.S.	302	1.67	70%	21%	61
	Non-U.S.	111	1.88	64%	20%	27
Private Debt	U.S.	767	1.47	66%	17%	72
	Non-U.S.	340	1.33	50%	15%	20
Real Assets	U.S.	1,486	1.39	61%	19%	132
	Non-U.S.	745	1.37	47%	18%	61
Other PE	U.S.	949	1.80	80%	16%	141
	Non-U.S.	477	1.66	69%	15%	55
Total		8,243	1.62	69%	18%	1,127

Notes: The amount invested and the carry are reported in billions of USD.

Table 7: Characteristics Across Investor Types

	Private Pension	Public Pension	Asset Mgmt.	Endow.	Found.	Captive
TVPI	1.63	1.62	1.64	1.67	1.65	1.63
$TVPI_{CF}$	1.63	1.64	1.59	1.69	1.64	1.59
PME-KS	1.00	0.99	0.98	1.02	1.01	0.99
PME-DLP	1.04	1.03	1.01	1.08	1.07	1.03
PME-KN	-0.08	-0.09	-0.07	-0.08	-0.05	-0.06
NPV (USD mn)	34.22	22.80	1.53	105.19	76.20	47.03
Carry / Profit	18.2%	18.3%	18.4%	17.3%	17.6%	18.3%
% Outliers	1.26%	0.99%	4.98%	1.53%	2.53%	3.08%
% In-the-Carry	72%	72%	67%	67%	71%	71%
LP Size	1,128	4,502	879	603	544	1,445
LP Age	12.8	14.7	11.3	13.3	13.2	13.1
U.S.-based LP (1/0)	77%	59%	33%	97%	95%	39%
U.S. Funds (%)	73%	68%	41%	83%	84%	51%
Fund Weight (%)	2.3%	3.3%	3.4%	1.8%	1.9%	3.9%
% VC	2.5%	2.3%	9.7%	2.7%	3.5%	7.1%
% Other PE	31.2%	30.8%	13.6%	40.4%	33.7%	19.8%
N Funds (per LP)	33	69	26	22	20	35
N LPs	717	504	582	326	633	390

Notes: This table reports performance, carry, and portfolio composition by LP type. Abbreviated column labels: Priv. Pen. = Private Pension, Publ. Pen. = Public Pension, Asset Mgmt. = Asset Manager, Endow. = Endowment, Found. = Foundation. Carry / Profit reflects the effective share of profits paid in carry. "Outliers" are LPs with effective carry rates that are either negative or above 25%.

Table 8: Carry and LP Characteristics

	Dependent variable is: LP Carry / Profit					
Private Pension	-0.309	-0.331	-0.364*	-0.365*	-0.164	-0.229
	(0.219)	(0.215)	(0.180)	(0.175)	(0.176)	(0.181)
Public Pension	-0.878***	-1.039***	-0.970***	-0.921**	-0.674*	-0.793**
	(0.241)	(0.256)	(0.299)	(0.322)	(0.330)	(0.314)
Asset Manager	2.404***	2.305***	2.052***	1.365***	0.332	0.437
	(0.326)	(0.345)	(0.549)	(0.376)	(0.301)	(0.383)
Endowment	-1.267***	-1.281***	-1.308***	-1.216***	-0.801***	-0.470***
	(0.430)	(0.429)	(0.326)	(0.260)	(0.165)	(0.148)
Captive	1.513**	1.423**	1.326***	1.105**	0.481	0.411
	(0.647)	(0.646)	(0.456)	(0.396)	(0.442)	(0.521)
TVPI	0.827	0.813	0.877	0.913	2.016**	-0.813
	(0.665)	(0.656)	(0.625)	(0.621)	(0.833)	(0.687)
LP Size	0.578***	0.491**	0.518***	0.608***	0.087	-0.014
	(0.162)	(0.185)	(0.172)	(0.150)	(0.090)	(0.090)
LP Age	0.052*	0.043	0.042	0.040*	0.046**	0.038**
	(0.026)	(0.025)	(0.026)	(0.023)	(0.017)	(0.018)
U.S.-based LP	-0.347	-0.434	0.596	0.516	0.508	0.683*
	(0.417)	(0.432)	(0.462)	(0.359)	(0.300)	(0.369)
Fund Weight (%)	-3.708	-2.359	-3.509	-6.844	1.891	5.159*
	(4.251)	(4.366)	(3.860)	(4.019)	(2.839)	(2.814)
N Funds		0.004**	0.003*	0.002	0.002*	0.004**
		(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
% U.S. Funds			-2.121***	-2.861***	-1.883***	-2.177***
			(0.499)	(0.462)	(0.496)	(0.574)
% U.S.-VC				11.335***	8.038***	8.719***
				(2.176)	(1.742)	(1.813)
% Other PE					-7.620***	-7.864***
					(0.463)	(0.487)
% In-the-Carry						6.186***
						(0.758)
R-squared	0.118	0.120	0.130	0.175	0.335	0.378
N Observations	3,152	3,152	3,152	3,152	3,152	3,152

Notes: The table reports OLS regression estimates at the Limited Partner (LP) level. The dependent variable is the LP relative carry, i.e., total carry (across all the funds an LP invested in) divided by total profits obtained. Standard errors (in parentheses) are two-way clustered by investment strategy and geographic focus. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 9: Fund Performance and Past Carry

Panel A: All Prior Funds Included

	$TVPI_{CF}$	PME-KS	PME-DLP	PME-KN	NPV
Past Carry	0.031*	0.025***	0.022***	0.030***	15.226**
	(0.016)	(0.006)	(0.005)	(0.006)	(6.922)
Past Performance	0.208***	0.206***	0.187***	0.073	0.157***
	(0.040)	(0.026)	(0.029)	(0.054)	(0.051)
Other control variables	Yes	Yes	Yes	Yes	Yes
Strategy Fixed Effects	Yes	Yes	Yes	Yes	Yes
Geography Fixed Effects	Yes	Yes	Yes	Yes	Yes
R-squared	0.253	0.189	0.361	0.348	0.091
N Observations	2,569	2,569	2,569	2,569	2,569

Panel B: With 5-Year Fund Lag

	$TVPI_{CF}$	PME-KS	PME-DLP	PME-KN	NPV
Past Carry	-0.002	0.019**	0.014**	0.019***	3.546
	(0.007)	(0.008)	(0.006)	(0.005)	(8.221)
Past Performance	0.126***	0.040	0.053*	-0.036	0.010
	(0.022)	(0.033)	(0.025)	(0.047)	(0.043)
Other control variables	Yes	Yes	Yes	Yes	Yes
Strategy Fixed Effects	Yes	Yes	Yes	Yes	Yes
Geography Fixed Effects	Yes	Yes	Yes	Yes	Yes
R-squared	0.220	0.142	0.331	0.342	0.068
N Observations	1,799	1,799	1,799	1,799	1,799

Notes: The table reports OLS regression estimates. The dependent variable in each specification is indicated at the top of the column. Performance and Past Performance are measured using the same metric within each specification. In Panel A, past performance is computed across all funds previously raised by the GP (value-weighted). In Panel B, funds raised less than five years before the focal fund are excluded from this calculation. Other control variables include fund size, total invested across preceding funds, GP age, and GP reputation. Strategy fixed effects include Venture Capital, Buyout, Real Assets, Other PE, and Private Debt, which sum to a unit vector. Geography fixed effects include North America and Europe (RoW is excluded). The sample is restricted to funds with available cash flow data. Standard errors (in parentheses) are two-way clustered by investment strategy and geographic focus. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 10: Carry and GP Characteristics

	Dependent variable is: GP Carry / Profit				
Performance metric used below:	$TVPI_{CF}$	PME-KS	PME-DLP	PME-KN	NPV
Performance	3.792***	8.153***	8.294***	7.829***	0.003***
	(0.306)	(0.534)	(0.638)	(0.693)	(0.001)
GP Size	0.456**	0.440**	0.419**	0.373**	0.411**
	(0.165)	(0.153)	(0.157)	(0.167)	(0.179)
GP Age	0.117**	0.120**	0.117**	0.123**	0.102**
	(0.043)	(0.043)	(0.041)	(0.044)	(0.042)
GP Reputation	0.894	1.039	1.102	1.316	1.908**
	(0.780)	(0.808)	(0.741)	(0.817)	(0.666)
Buyout	3.302***	3.006***	2.975***	1.331*	3.224***
	(0.822)	(0.787)	(0.789)	(0.699)	(0.766)
Private Debt	2.897***	2.592***	1.697**	-0.193	1.991**
	(0.786)	(0.786)	(0.756)	(0.640)	(0.758)
Real Assets	2.592**	2.684***	4.268***	2.750***	1.590
	(0.933)	(0.894)	(0.965)	(0.846)	(0.930)
Venture Capital	3.987***	4.419***	6.659***	5.023***	3.475***
	(0.923)	(0.912)	(0.997)	(0.841)	(0.851)
Europe Focus	-0.239	-0.167	-0.209	-0.094	0.068
	(0.690)	(0.727)	(0.732)	(0.711)	(0.709)
U.S. Focus	0.148	-0.044	-0.121	0.214	0.480
	(0.587)	(0.578)	(0.558)	(0.526)	(0.613)
R-squared	0.184	0.196	0.188	0.176	0.096
N Observations	1,498	1,498	1,498	1,498	1,498

Notes: The table reports OLS regression estimates at the General Partner (GP) level. The dependent variable is the GP relative carry, i.e., total carry (across all the funds managed by a GP) divided by total profits generated. GP reputation is 1 if GP has high reputation and 0 otherwise. Standard errors (in parentheses) are two-way clustered by investment strategy and geographic focus. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 11: Carry Extrapolation for Funds Without Performance Data

Haircut on Predicted TVPI (%)	0	2.5	5	7.5	10
Total Carry (USD millions)	532,134	496,753	464,543	434,638	407,620
Carry/Profit (%)	17.1	17.2	17.5	17.8	18.4

Notes: The table reports extrapolated carry for 27,446 funds for which we have information on vintage, size, strategy, and region but lack performance. We predict each fund's TVPI from these four variables using the in-sample funds, then apply uniform TVPI haircuts of 0–10% to reflect selection concerns. For each scenario we translate predicted performance into carry using the corresponding fee terms (carry rate, hurdle, catch-up) and our waterfall. Amounts are in USD millions.