Tying Fees to Investment Activity in Private Equity*

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Abstract

I study whether a popular compensation contract in private equity induces fund managers to make value-decreasing investments. The contract pays as fees a percentage of capital invested into the fund's unrealized projects starting from year six of the fund life cycle, giving managers an opportunity to receve fees by investing and managing capital. Managers call capital when they invest, and I document that funds with the contract are more likely to call capital in a quarter than those without starting from the beginning of year five to the end of year seven of the fund life cycle. Calling capital during the three years is associated with worse fund performance, but just for funds with the contract. The capital calls of funds with the contract are less sensitive to credit spread than the capital calls of funds without, but just during the three years. I obtain these results by using a proprietary dataset and an adequately chosen control group of funds. Overall, a popular compensation contract in a large asset class appears to induce managers to make value-decreasing investments.

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1 Introduction

Private equity is a \$6.3 trillion asset class where investors (LPs) commit capital to funds not knowing how their managers (GPs) will deploy the capital. GPs call the capital over time as investment opportunities arise during the fund's investment period — the first five years — and also exit investments as exit opportunities raise. Since LPs do not know how GPs will deploy capital, they typically either pay a percentage (typically between 1.5% to 2.5%) of their initial commitments as management fees throughout the fund's life (fixed basis) or switch at the end of the fund's investment period to paying a percentage of capital invested into the fund's unrealized projects (changing basis). Switching basis in this way accounts for the fact that GPs do less work managing a fund if they invest less or exit projects early. LPs generally favor to have a changing basis since it reduces fees.

This paper studies whether having a changing basis induces GPs to make value-decreasing investments. The starting point of this question is that a changing basis gives GPs an opportunity to receive fees by investing and managing capital during the fund's post-investment period, raising an agency concern that it may induce GPs to make value-decreasing investments for fees. It is important to study this question since it informs how a compensation scheme that is popular in a large asset class shapes investment decisions and fund performance. To study this question, I use a proprietary dataset, and a matching empirical design that constructs an adequately chosen control group of funds. Overall, I document results that are consistent with the view that the contract induces GPs to make value-decreasing investments from the beginning of year five to the end of year seven of the fund life cycle.

Ex-ante, it is not obvious whether the contract should induces GPs to make value-decreasing investments. It is entirely possible that LPs strategically select funds who underinvest without the contract to have the contract such that they underinvest less. There are several reasons why some GPs may underinvest. They may do so because the effort costs associated with investing is large, or because they manage multiple funds and profitable investment opportunities must be shared. It is also plausible that having a changing basis does not induce GPs to invest more. GPs may refrain from investing more because the effort cost associated with investing is too large, or because investing more hurts fund performance and several governance mechanisms make it costly for GPs to have low fund returns.[1]

I hypothesize that the overinvestment problem, if it occurs, should be concentrated in quarters shortly before and after the change in fee basis. Before the end of the investment period, GPs can increase net invested capital by making new investments, spending more equity per deal, and making secondary equity injections to their portfolio companies. Even after the investment period expires, funds can still increase net invested capital by making secondary equity injections. The hypothesis here is that GPs strategically do these activities around the change in basis since doing so all-else-equal increases the present value of management fees from investing. The agency concern is that GPs engage in these activities despite the fact that they sacrifice fund performance.

Using a baseline sample that consists of 194 buyout funds with a fixed basis (fixed basis funds) and 80 buyout funds with a changing basis (changing basis funds) with vintage years from 1984 to 2009, my analysis delivers two main results. First, having a changing basis correlates positively with the quarterly likelihood of calling capital, but just from the beginning of year five to the end of year seven of the fund life cycle. Quantitatively, having a changing basis is associated with a 10.3% points (25.2% of the sample mean) increase in the quarterly likelihood of calling capital during the three years, where this association is statistically significant at the 1% level. Second, the quarterly likelihood of calling capital during the three years correlates negatively with fund performance, but just for funds with a changing basis. A one standard deviation increase in the quarterly likelihood during the three years is associated with a 0.02 points (1.6% of the sample mean) increase in net-of-fee public-market-equivalent (PME) of Kaplan and Schoar (2005) for fixed basis funds, but is associated with a 0.13 points (10.3% of the sample mean) decrease in net-of-fee PME for changing basis funds, where the difference in the associations is statistically significant at the 5% level.

Overall, the evidence is consistent with the agency hypothesis and additional results limit the scope for alternative interpretations. First, while changing basis funds differ from fixed basis funds along observable variables — changing basis funds are on average larger, have lower fund sequence numbers, have higher GP ownership percentages, and are more likely to be raised during fundraising booms — my two main results persist when I run horse races against these correlated

[1]There are at least three such governance mechanisms. One is that GPs typically obtain a fraction of the fund's net profits as performance fees, called carried interest, once their funds surpass a threshold. Another is that GPs often own a share of their own funds. Finally, their performance affects their chances of raising future funds.

characteristics. Since these characteristics generally proxy GP skill, it appears unlikely that the results are functions of the difference in GP skill between the two fund groups.

Second, the results are robust to a matching empirical design where I match each changing basis fund to five fixed basis funds with similar capital call dynamics during the first sixteen quarters. I do so by matching on the following two fund-level variables: the quarterly likelihood of calling capital during the first four years, and the slope of the quarterly likelihood of calling capital over the first sixteen quarters. The idea behind this matching is that funds that have similar capital call dynamics during the first four years will likely have similar capital call dynamics going forward if a changing basis does not influence GPs' investment decisions. Supporting this premise, I find that two match variables are statistically and economically important predictors of the quarterly likelihood of calling capital during the three years.

Third, additional results rule out several specific alternative explanations. One alternative explanation for my first main result is that funds with good investment opportunities select into having a changing basis. To explore this alternative explanation, I examine if the result disappears when I have fund family by quarter fixed effects. Note that investment decisions in private equity are made at the GP-level, not fund-level. Thus if GPs select into a having changing basis because they foresee positive investment shocks, these shocks are likely at the GP-level. Fund family by quarter fixed effects should absorb these shocks. I find that my first main result is robust to having these fixed effects.

An alternative explanation for my second main result is that the following mechanical relation drives it. Frequently calling capital during the three years all-else-equal increases net invested capital during the post-investment period, which hurts net-of-fee fund performance by increasing management fee payments for changing basis funds. But I find that my second result persists when I add as a control the present value of scaled total management fees (total management fees divided by committed capital), making this explanation unlikely.

To explore whether funds select into having a changing basis in ways that cause biases in my tests, I examine how having a changing basis correlates with the quarterly likelihood of calling capital at the GP's previous fund. A positive correlation suggests that funds that frequently call capital during the three years even without a changing basis select into having the contract. A negative correlation implies the opposite selection. I find that the correlation is negative and statistically insignificant.

Several caveats are in order about interpreting my results. First, the vintage years of my sample of funds range from 1984 to 2009. The industry has become more competitive during recent years. If competition mitigates agency problems between GPs and LPs, then the overinvestment problem from a changing basis may be less of an issue for recent funds. Second, this paper studies the average effect of a changing basis on GPs' investment decisions. While I find evidence that supports the agency hypothesis, it may be that a changing basis mitigates an underinvestment problem or have weak effects on investment decisions for subsets of funds. Third, I am unable to rule out the possibility that unobserved fund characteristics that correlate with having a changing basis drive my findings.

To explore the economic significance of my main results, I study the following two plausible implications. One is that LPs trade off reducing fees and inducing an overinvestment problem by having a changing basis. I document several facts that are consistent with this trade off view. First, having a changing basis instead of a fixed basis is associated with a 4.2% point decline in the present value of scaled total management fees, which all-else-equal should improve net-of-fee PME by 0.08 (6.4% of the sample mean). Second, despite the positive effects from reducing fees, changing basis funds on average neither outperform nor underperform fixed basis funds net-of-fee. Third, changing basis funds outperform (underperform) fixed basis funds net-of-fee when one evaluates the relative performance amongst funds with low (high) levels of scaled dry powder (unused capital commitments divided by total capital commitments) at the beginning of year five of the fund life cycle. This last result persists when I add as a control the present value of scaled total management fees, ruling out explanations that are based on the differences in management fee payments between the two fund groups.

I next explore whether a changing basis, by rewarding GPs for spending equity, makes capital calls less sensitive to credit spread. This implication is important since, if true, it indicates that management fee contracts matter for how credit market conditions shape investment activity in private equity markets.[2] I document that of the three subsets of the fund life cycle — from quarter one to quarter sixteen, from quarter seventeen to quarter twenty-eight, from quarter twenty-nine

[2] Axelson, Stromberg and Weisbach (2009) and Axelson et al. (2013)) show that high credit spread damp investment activity in private equity. But they do not study how management fee contracts of funds shape the effect.

and onwards — the capital calls of changing basis funds are less sensitive to credit spread than the capital calls of fixed basis funds, but just for the middle subset of the life cycle.

Whether and how a changing basis shapes GPs' investment decisions are open questions in the literature. The paper that comes closest to answering this question is Robinson and Sensoy (2013), who show that funds have late distributions when they have a changing basis. But they do not study investment decisions, and more importantly, whether the cash flow effects improve or hurt fund performance is not studied. Arcot et al. (2015) and Degeorge, Martin and Phalippou (2016) show that buyout funds tend to do negative NPV secondary buyouts near the end of the investment period. But they cite other mechanisms besides the incentive from a changing basis that may explain their findings: overinvesting to avoid to the reputational damage of having dry powder left over, or to expedite raising the next fund. In this sense, how a changing basis shapes investment decisions remains an open question.

This paper relates to several strands of the private equity literature. It relates to the papers that study private equity fund performance (Robinson and Sensoy (2016); Harris, Jenkinson and Kaplan (2014); Kaplan and Schoar (2005); Phalippou and Gottschalg (2009)), agency problems between GPs and LPs (Axelson, Stromberg and Weisbach (2009); Axelson et al. (2013); Chakraborty and Ewens (2018); Huther (2022)), and contractual provisions and fees in private equity (Robinson and Sensoy (2013); Metrick and Yasuda (2010); Huther et al. (2019); Litvak (2009)); Phalippou, Rauch and Umber (2018)). It relates more broadly to papers that study how fees relate to manager behaviors and fund performance in other delegated management settings.

The paper is organized as follows. Section 2 develops testable hypotheses. Section 3 describes the data. Section 4 describes the empirical strategy. Section 5 presents the main results. Section 6 considers several extensions. Section 7 explores the economic significance of the paper's findings by studying the two implications described above. Section 8 concludes.

2 Hypothesis Development

I hypothesize that if a changing basis induces GPs to make value-decreasing investments, that the overinvestment problem should be concentrated in quarters shortly before and after the change in fee basis. Note that GPs can increase net invested capital both before and after the end of the investment period. Prior to the end of the investment period, funds can increase net invested capital by doing new deals, spending more equity per deal, or making secondary equity injections to their portfolio companies. After the end of the investment period, funds can continue to make secondary equity injections. The hypothesis here is that if a changing basis induces GPs to excessively engage in these activities in ways that hurt fund performance, that they do so strategically around the change in fee basis since doing so all-else-equal increases the present value of management fees from spending equity.

The hypothesis rests on two premises. The first is that a changing basis induces GPs to call more capital shortly before and after the change in fee basis. The second is that this behavior hurts fund performance. I formulate two testable hypotheses that correspond to these premises.

> *Hypothesis 1: Having a changing basis correlates positively with the quarterly likelihood of calling capital, and the correlation is stronger in quarters shortly before and after the change in fee basis.*

I make several comments about my first hypothesis. First, note that I study the correlation with the quarterly likelihood of calling capital, not capital call levels. I do so since capital calls include management fee payments and I am interested only in the capital calls associated with investment activity. Due to data constraints, I am unable to cleanly isolate the part of capital calls that is associated with investment activity. However, the management fee payments are periodic (e.g., quarterly, semi-annual, annual). Thus they may cause a level shift in the likelihood of calling capital but should not affect the slope of the likelihood over the fund life cycle, which is of chief interest in this paper.

Second, a positive correlation, while consistent with the view that a changing basis induces GPs to invest more, does not necessarily indicate it. It may be that funds that frequently call capital even without a changing basis select into having the contract because they stand to lose less fees from having a changing basis. In my analysis, I take a number of steps to explore whether this selection explanation drives my results.

Third, the first hypothesis does not have an obvious prediction. In particular, it is entirely possible that a changing basis does not induce GPs to call more capital. GPs may refrain for several reasons. They may do so because the effort costs associated with investing is too large.

Alternatively, if investing more hurts fund performance, they may refrain because several governance mechanisms make it too costly for GPs to have low fund returns.

> *Hypothesis 2: The quarterly likelihood of calling capital shortly before and after the change in fee basis correlates negatively with fund performance for changing basis funds.*

If a changing basis induces GPs to make value-decreasing investments shortly before and after the change in fee basis, then such an effect should hurt fund performance. I make several comments about this second hypothesis. First, a negative correlation, while suggestive of an overinvestment problem from a changing basis, does not necessarily indicate it since other factors may drive the negative relation. In my empirical tests, I consider several candidate sources.

Second, the second hypothesis also does not have an obvious prediction. In particular, it is entirely plausible that LPs strategically select GPs that underinvest without a changing basis to have the contract such that they underinvest less as a result. In this case, a changing improves fund performance by mitigating an underinvestment problem. There are several reasons why some GPs may underinvest. They may do so because the effort costs associated with investing are too large. Alternatively, they may do so because they manage multiple funds and profitable investment opportunities must be shared by multiple funds.

3 Data

A Building Baseline Sample

I use a confidential and proprietary dataset of private equity funds obtained from a large institutional investor. Unlike most private equity datasets (e.g., Burgiss, Preqin, and Pitchbook), this dataset has GPs' management fee terms and is thus apt for this study. The dataset consists of 542 buyout funds and 295 venture capital funds with vintage years ranging from 1984 to 2009 and total capital commitments of almost $600 billion. Robinson and Sensoy (2013) and Robinson and Sensoy (2016) show that this dataset is representative of the private equity industry during the vintage years. As noted in Robinson and Sensoy (2013), the data provider expanded his private equity portfolio over time through a series of mergers, and hence this dataset can be thought of as an assembly of portfolios of formerly independent LPs.

I apply several filters to the dataset to build a sample that is suited to analyze the effects of having a changing fee basis instead of a fixed fee basis. I drop the venture capital funds, since less than 14% of the venture capital funds reduce management fees by changing the management fee basis. Among buyout funds, I require that the funds pay management fees, that the initial management fee basis be committed capital, that the funds either keep the basis fixed at committed capital throughout their lives (fixed basis funds) or switch the basis to net invested capital (changing basis funds), that their management fee percentage or the basis do not depend on the other funds managed by the GP, and that the GP do not provide more than 90% of the fund's committed capital. Applying these filters results in my baseline sample, which consists of 194 fixed basis buyout funds and 80 changing basis buyout funds.[3] The vintage years of my baseline sample of funds range from 1984 to 2009, and the total capital commitments are almost $220 billion.

Three comments are in order about my filters. First, I am conservative when identifying the changing basis funds; I require that the management fee description explicitly say net invested capital or provide a delineation of this basis. Second, I drop funds if their management fee percentage or basis depends on the other funds managed by the GP since these features give the GP incentives that confound empirical tests.[4] Finally, note that my filters drop the funds with the following management fee contracts: contracts whose initial fee basis is not committed capital or contracts that change the fee basis to a basis that is not net invested capital.[5] The funds with these alternative contracts are dropped since they give GPs incentives that differ from the incentive from changing the fee basis from committed capital to net invested capital.[6] In the dataset, only a small number of funds have these alternative contracts.

[3]Metrick and Yasuda (2010) and Robinson and Sensoy (2013) respectively report that 84% and 43% of buyout funds in their sample change management fee basis to any new basis (not necessarily net invested capital). Note that this paper studies the effects of changing the fee basis to net invested capital.

[4]For example, several funds lower the management fee percentage or the basis when the GP raises the next fund. This feature confounds empirical tests in two ways. First, the timing of the change in fee basis does not necessarily occur at the end of the investment period for these funds. Second, this feature plausibly makes it costly for the GP to accelerate capital calls, since this in turn expedites raising the next fund, which in turn lowers the management fees from his current fund.

[5]Examples of alternative bases are invested capital, contributed capital, net contributed capital, and net asset values.

[6]For example, changing the fee basis from committed capital to invested capital at the end of the investment period gives GPs the incentive to invest more, but not necessarily near the end of the investment period.

B Key Variables

In the dataset, I observe several fund characteristics at the fund-level and at the fund-quarter level. At the fund-quarter level, I observe net asset value of funds and net-of-fee cash flows between LPs and GPs. Using these cash flows, I construct the net-of-fee public-market-equivalent (PME) of funds with the S&P 500 index as the public equity index. I follow the literature and use this variable as my net-of-fee fund performance measure. Unfortunately, I do not observe net invested capital of funds. I approximate this variable using net asset value scaled by the final cash-on-cash multiple of each fund, and then I winsorize this variable to be less than committed capital.

I observe the following variables at the fund-level: fund sequence number, fund size (capital commitments from all LPs), capital commitments by GPs, carry percentage level, and a description of the fund's management fee contract, which states the management fee percentage and the fee basis. Following the literature, I construct the GP ownership percentage variable as capital commitments by the GP divided by fund size, expressed as a percentage. For each fund, I estimate the total management fee payments during the fund's life and scale it by fund size, calling it scaled total management fees. The management fee description often does not specify whether the fee payments are made at the quarterly frequency, semi-annual frequency, or annual frequency. In this case, I assume management fee payments are made at the quarterly frequency. I also compute the present value of scaled total management fees where I discount the management fees assuming a 5% risk-free rate following Metrick and Yasuda (2010). Finally, I winsorize all ratio variables at 5% to ensure that my findings are not driven by outliers.

C Summary Statistics

Table 1 provides summary statistics separately for all buyout funds in the dataset, funds in my baseline sample, fixed basis funds, and changing basis funds. For each fund characteristic, I report the mean and the median (in parentheses).

The buyout funds in the dataset and the funds in my baseline sample are similar. As can be seen, the two groups have similar sizes, fund sequence numbers, GP ownership percentages, carry percentages, and scaled total management fees. My baseline sample covers 36.8% of the buyout funds in the dataset in terms of capital commitments.

The changing basis funds and the fixed basis funds differ along several fund characteristics. An average changing basis fund has a committed capital of $1,226 million, fund sequence number of 3.29, GP ownership percentage of 2.67%, and scaled total management fees of 10.7%. In contrast, an average fixed basis fund has a committed capital of $628 million, lower fund sequence number of 2.80, lower GP ownership percentage of 2.03%, and higher scaled total management fees of 18.2%.

D Correlated Characteristics

Despite the prevalence of the changing basis contract in private equity markets, the basic question of which funds have a changing basis remains an open question in the literature. Section D.1 studies how the propensity of having a changing basis varies in the cross-section of funds within vintage years. Section D.2 examines how the propensity varies in the time-series.

D.1 Cross-section

To examine which funds have a changing basis in the cross-section funds within vintage years, I run the following fund-level regression:

$$Net_i = \beta X_i + \alpha_{v(i)} + \epsilon_i \tag{1}$$

where i indexes funds; Net_i is a dummy that equals one if fund i has a changing basis and zero if it has a fixed basis; X_i is a vector of fund-level controls comprising of the natural log of fund size of fund i, the natural log of fund sequence number of fund i, the inverse hyperbolic sine of GP ownership percentage of fund i[7], a dummy that equals one if fund i has a performance fee percentage greater than 20% and zero otherwise, and a dummy that equals one if fund i has a performance fee percentage less than 20% and zero otherwise; and $\alpha_{v(i)}$ are vintage year fixed effects. Standard errors are clustered at the vintage year level.

Column 1 of Table 2 presents the results. Several patterns emerge. Having a changing basis correlates positively with fund size, negatively with fund sequence number, and positively with GP ownership percentage. These correlations help explain several findings in the private equity literature. Robinson and Sensoy (2013) show that large funds obtain a small fraction of fund size

[7] We take the inverse hyperbolic sine of this variable since it often takes the value of zero.

as management fees. This paper shows that this relationship may at least partly stem from the fact that large funds are likely to have a changing basis. Arcot et al. (2015) shows that low reputation GPs tend to overinvest into negative NPV secondary buyouts near the end of the investment period. This paper shows that this finding may at least partly reflect the fact that low reputation GPs, as proxied by having low fund sequence numbers, tend to have a changing basis.

D.2 Time-series

Do market conditions affect whether funds have a changing basis or a fixed basis? The literature identifies several market conditions — aggregate risk premium, credit spread, and industry-level fundraising — that explain the variations in private equity investments and GP compensation levels over time (Axelson, Stromberg and Weisbach (2009); Axelson et al. (2013); Haddad, Loualiche and Plosser (2017); Robinson and Sensoy (2013)). I explore whether these market conditions explain the time-series variation in the propensity to have a changing basis. I drop vintage year effects and add the following time-series variables as independent variables: the natural log of industry-level fundraising in the fund's vintage year and the aggregate risk premium and the credit spread at the end of the quarter previous to the fund's first quarter. To be consistent with the literature, I use the industry-level fundraising measure from Robinson and Sensoy (2013) and the credit spread and the aggregate risk premium measure from Haddad, Loualiche and Plosser (2017).[8]

Column 2 presents the results. As can be seen, having a changing basis has a neutral relationship with the aggregate risk premium and the credit spread, but correlates positively with the natural log of industry-level fundraising at vintage year.[9] But this positive correlation appears to merely reflect the fact that having a changing basis has become popular over time, and fundraising levels have also increased over time. In untabulated results, I find that the correlation becomes statistically insignificant when I limit the sample to the funds raised after 1998 — the median fundraising year in my sample of funds — despite the fact that the standard deviation of industry-level fundraising levels is greater in the post-1998 years.

[8] I thank the authors for sharing their measures.

[9] This finding may appear to contradict the finding of Robinson and Sensoy (2013) that the funds raised during fundraising booms obtain a larger fraction of fund size as management fees than the funds raised during fundraising troughs. But in untabulated results, I find that the funds raised during fundraising booms have higher management fee percentages than the funds raised during fundraising troughs.

E Capital Call Dynamics over the Fund Life Cycle

To describe how the quarterly likelihood of calling capital varies over the fund life cycle for the two fund groups, I run the following fund-quarter level regression:

$$\text{Call}_{it} = \sum_{k=2}^{13+} \beta_k \text{Yr}_{it}^k + \sum_{k=1}^{13+} \gamma_k \text{Yr}_{it}^k Net_i + \omega X_i + \alpha_t + \epsilon_{it} \tag{2}$$

where i indexes funds; t indexes quarters; $Call_{it}$ is a dummy that equals one if fund i calls capital at quarter t and zero otherwise; Yr_{it}^k is a dummy that equals one if fund i is in year k of its life at quarter t and zero otherwise for $k = 1, 2, ..., 12$; Yr_{it}^{13+} is a dummy that equals one if fund i is in year 13 or later of its life at quarter t and zero otherwise; Net_i is a dummy that equals one if fund i has a changing basis and zero otherwise; X_i is a vector of fund-level controls comprising of the natural log of fund size, the natural log of fund size squared, the inverse hyperbolic sine of GP ownership percentage, a dummy that equals one if the GP ownership percentage is greater than 20% and zero otherwise, and a dummy that equals one if the GP ownership percentage is less than 20% and zero otherwise; and α_t are quarter fixed effects. Standard errors are clustered at the quarter level. The coefficients of interest are $(\gamma_1, \gamma_2, ..., \gamma_{13+})$. These coefficients indicate whether changing basis funds are more likely to call capital in a quarter than fixed basis funds during each year of the fund life cycle. According to my hypothesis, the coefficients should be positive and statistically significant in years close to the end of the investment period.

Figure 1 plots the regression estimates in the following way. The actual regression result is reported in Appendix Table A1. In the figure, the blue dots are the sample quarterly likelihood of calling capital for each year of the fund life cycle for fixed basis funds. I construct the red dots by adding the estimates of the interaction terms, and I also plot the 90% confidence interval for the estimates. As can be seen, there is a bump from year five to year seven of the fund life cycle, indicating that changing basis funds are more likely to call capital in a quarter than fixed basis funds during the three years.

4 Empirical Strategy

A Matching

The finding is the previous section — that changing basis funds are more likely to call capital in a quarter than fixed basis funds just from year five to year seven of the fund life cycle — is consistent with the agency hypothesis. The endogeneity concern is here is that funds with such a investment life cycle select into having a changing basis.

As a way to study whether such a selection drives the result, I implement a matching empirical design where I match each changing basis fund with five fixed basis funds with similar capital call dynamics during the first sixteen quarters. I match on the following two fund-level variables: the quarterly likelihood of calling capital during the first sixteen quarters, and the slope of the quarterly likelihood of calling capital across fund age for the first sixteen quarters. The idea here is that funds that make similar capital calls during the first sixteen quarters will likely make similar capital calls going forward if a changing basis does not have meaningful effects on GPs' investment decisions.

This matching empirical design builds on the fact that GPs are forward-looking agents. To illustrate the idea, suppose funds that frequently make value-decreasing investments from year five to year seven of the fund life cycle select into having a changing basis. Since GPs are forward-looking agents that want to improve fund return, they likely invest in ways that minimize the overinvestment they do during the three years. Thus one can build an adequate control by selecting funds that invest similarly as funds with a changing basis during the first four years of the fund life cycle.

I build the matched sample by taking the following steps. First, for each fund, I regress a dummy for calling capital in a quarter on the natural log of quarterly fund age for the first sixteen quarters and save the regression coefficient, henceforth refereed to as $\hat{\beta}$. Next, I regress a dummy for calling capital in a quarter on quarterly fund age fixed effects and quarter fixed effects. I save the residuals from this regression and then for each fund average the residuals for the first sixteen quarters. Henceforth, I refer to this average as $Q1toQ16P(Call)$. For each changing basis fund, I compute the following distance measure with fixed basis funds where the distance is the sum of squared differences in $\hat{\beta}$ and $Q1toQ16P(Call)$, where each sum of the squared difference is scaled by the standard deviation of the variable. For each changing basis fund, I select the five closest fixed basis funds according to the distance measure. This matching procedure results in 80 changing basis funds, and 400 fixed basis funds.

Panel A of Table 3 provides summary statistics on the matched sample. Columns 1-2 reproduces the summary statistics for the baseline sample as benchmark. Columns 3-4 present the summary statistics for the matched sample. As can be seen, the two fund groups have similar $\hat{\beta}$ and $Q1toQ16P(Call)$ after matching. Though I do not match on other fund characteristics, they become closer.

Panel B of of Table 3 studies using a fund-level regression the determinants of the quarterly likelihood of calling capital during the three years, henceforth called $Q17toQ28P(Call)_i$. The two statistically significant determinants are the two match variables. Other variables – fund size, fund sequence number, GP ownership percentage, and carry percentage — are not statistically significant determinants.

B Fund-quarter Level Regression

To study the first hypothesis, I run the following fund-quarter level regression:

$$\text{Call}_{it} = \beta_2 Q17toQ28_{it} + \beta_3 Q29^+_{it} + \gamma_1 Q1toQ16_{it} Net_i + \gamma_2 Q17toQ28_{it} Net_i + \gamma_3 Q29^+_{it} Net_i + \omega X_i + \alpha_{ft} + \epsilon_{it} \quad (3)$$

where i indexes funds; t indexes quarters; f indexes fund family; $Call_{it}$ is a dummy that equals one if fund i calls capital at quarter t and zero otherwise; $Q1toQ16_{it}$ is a dummy that equals one if fund i is between quarter one to quarter sixteen of its life cycle at quarter t; $Q17toQ28_{it}$ is a dummy that equals one if fund i is between quarter seventeen to quarter twenty-eight of its life cycle at quarter t and zero otherwise; $Q29+_{it}$ is a dummy that equals one if fund i is at quarter twenty-nine or after of its life cycle at quarter t and zero otherwise; X_i is the vector of fund-level controls as in equation 2; and α_{ft} are fund-family by quarter fixed effects. The coefficients of interest are the interaction terms. They indicate whether changing basis funds are more likely to call capital in a quarter than fixed basis funds for each partition of the fund life cycle.

Fund family by quarter fixed effects are motivated by the fact that investment decisions in private equity are typically made at the GP-level, not fund-level. Thus if GPs select into having a changing basis because they foresee positive shocks from year five to year seven of the fund life cycle, it is likely that they foresee positive shocks at the GP-level. Fund family by quarter fixed effects absorb the effects of any GP-level shocks. This effect rules out selection stories that argue that GPs select into having a changing basis based on their forecasts of future shocks. While fund family by quarter fixed effects tighten the identification in this way, having them is not without costs. The sample size drops in column 3 because observations that are fund family by quarter singletons are dropped from the sample. Due to this cost, I also estimate the regression result with quarter fixed effects.

By having the fund-level controls X_i, the regression rules out the possibility that the observable fund characteristics — fund size, fund sequence number, GP ownership percentage, and performance fee percentage — explain the difference in quarterly likelihood of calling capital between the two fund groups. Note that these variables generally proxy for GP skill. Thus, it is unlikely that the difference in GP skill between the two fund groups drive the estimates of equation 3.

C Fund Level Regression

To study the second hypothesis, I run the following fund level regression:

$$PME_i = \beta_1 Net_i + \beta_2 Q17Q28P(Call)_i + \beta_3 Net_i Q17Q28P(Call)_i + \gamma X_i + \psi PV(MFees)_i + \alpha_{v(i)} + \epsilon_i \tag{4}$$

where i indexes funds; $Q17Q28P(Call)_i$ is the quarterly likelihood of calling capital from quarter seventeen to quarter twenty-eight for fund i which is estimated by regressing a dummy for calling capital in a quarter on quarter fixed effects and quarterly fund age fixed effects and averaging the residuals from quarter seventeen to quarter twenty-eight for each fund; X_i is the usual vector of fund-level controls; $PV(Mfees)_i$ is the present value of scaled total management fees of fund i; $\alpha_{v(i)}$ are vintage year fixed effects; all other variables are as defined previously. The sample is restricted to funds where I observe at least the first thirty quarters. Standard errors are clustered at the vintage-year level. The coefficient of interest is β_3, which is the interaction term. A negative coefficient on the interaction term indicates that frequently calling capital during the three years hurts fund performance for changing basis funds relative to the effect for fixed basis funds.

By having $PV(Mfees)_i$ as a control variable, I rule out the following mechanical relationship: frequently calling capital during the three years hurts net-of-fee fund performance by increasing management fee payments, which occurs since net invested capital all-else-equal rises during the post-investment period when funds frequently call capital during the three years.

5 Main Results

A Fund-quarter Level Regression

Table 4 presents the regression results when I estimate equation 3. Columns 1-3 report the regression results when I use the baseline sample. For brevity, just the coefficients on the interaction terms are reported. Column 1 has no time-series controls, while column 2 adds quarter fixed effects, and column 3 adds fund family by quarter fixed effects. Across all specifications, just the interaction term with $Q17toQ28_{it}$ is statistically significant, indicating that changing basis funds are more likely to call capital in a quarter than fixed basis funds just from the beginning of year five to the end of year seven of the fund life cycle. Quantitatively, having a changing basis instead of a fixed basis is associated with an increase in the quarterly likelihood of calling capital by 10.3% points (25.2% of the sample mean) during the three years according to the estimate in column 2.

It is noteworthy that the estimate on $Q17toQ28_{it}Net_i$ remains positive and statistically significant in column 3. As noted in Section 4, this result rules out selection stories that argue that GPs select into having a changing basis because they foresee positive investment shocks from year five to year seven of the fund life cycle. Note that sample size decreases in column 3 since the fund family by quarter singletons are dropped from the sample.

Columns 4-6 repeat the exercise on the matched sample. As in the regression results in columns 1-3, just the interaction term with $Q17toQ28_{it}$ is positive and statistically significant. The estimates also change little relative to the estimates when using the baseline sample. That the estimates change little makes it unlikely that the result in columns 1-3 merely reflect funds selectint into having a changing basis based on their forecasted life cycle dynamics.

B Fund Level Regression

Table 5 presents the regression results when I estimate equation 4. Columns 1-2 present the results when I use the baseline sample. Column 1 omits the present value of scaled total management fees as a control, and column 2 includes this control. As can be seen, for both columns, the coefficient on $Q17Q27P(Call)$ is positive and statistically insignificant, while the coefficient on the interaction term is negative and statistically significant. Quantitatively, a one standard deviation increase in the quarterly likelihood of calling capital from quarter seventeen to quarter twenty-eight of the fund life cycle is associated with an increase in net-of-fee PME by 0.02 (1.6% of the sample mean) for fixed basis funds, and a decrease in net-of-fee PME by 0.13 (10.3%) for changing basis funds according to the estimates in column 2.

It is noteworthy that the coefficient on $Net_iQ17Q28P(Call)_i$ remains negative and statistically significant in column 2. This finding rules out the mechanical effect where frequently calling capital during the three years lowers the net-of-fee fund performance of changing basis funds by increasing management fee payments.

Columns 3-4 repeat the exercise on the matched sample. As before, the coefficient on the interaction term is negative and statistically significant. If anything, the estimate becomes more negative. It appears that controlling for the fund life cycle dynamics by matching strengthens the negative association with fund performance for changing basis funds.

6 Extensions

This section conducts additional tests that sharpen the interpretation of my main results.

A Fund Size and GP Skill

I begin by discussing whether the differences in fund size or GP skill between the two fund groups explain my main results. For my first main result, note that the regression controls for fund size, ruling out the size effect story. The GP skill effect story is also ruled out to the extent that the controls in the regression — fund size, fund sequence number, GP ownership percentage, and performance fee percentage — proxy GP skill.

For my second main result, it remains a possibility that the differences in fund size or GP skill between the two fund groups explain the results. For example, it may be that large funds frequently make bad investments during the three years and having a changing basis merely proxies being a large fund. Analogously, it may be that low-skilled GPs frequently make bad investments during the three years and having a changing basis merely proxies being managed by a low-skilled GP.

To explore whether the second main result of the paper reflects size effects or GP skill effects, I interact the natural log of fund size and several GP skill proxies with $Q17Q28P(Call)_i$ and add the interaction terms as controls in my regression. If having a changing basis merely proxies these fund characteristics, then the effect should load on the added interaction terms and the interaction term with Net should become close to zero and statistically insignificant.

Table 6 presents the results when I use the baseline sample. The results on the matched sample are similar. Column 1 reproduces column 2 from Table 5 as a benchmark. Columns 2 reports the result when I add as a control the interaction term with the natural log of fund size, column 3 the interaction term with the natural of fund sequence number, column 4 the interaction term with the inverse hyperbolic sine of GP ownership percentage, and column 5 the interaction term with the natural log of industry-level fundraising at vintage year. As can be seen, the interaction term with Net remains negative and statistically significant across columns.

B Previous Fund

It is theoretically ambiguous whether funds that frequently call capital during the three years even without a changing basis select into having the contract. On the one hand, GPs that tend to frequently call capital during the three years may select into the contract knowing that they lose less management fees from having a changing basis. But on the other hand, LPs may avoid such GPs from having a changing basis for the same reason.

To empirically study this selection, I examine how having a changing basis correlates with the quarterly likelihood of calling capital during the three years at the GP's previous fund. A positive correlation suggests that funds that are prone to call capital during the three years select into having a changing basis. A negative correlation suggests the opposite.

I assess the correlation by running the following fund-level regression. The dependent variable is a dummy that equals one if a fund has a changing basis, and zero if it has a fixed basis. The independent variable of interest — $PrevQ1toQ16P(Call)$ — is the average of the residuals from quarter one to quarter sixteen of the GP's previous fund, where the residuals comes from regressing a dummy for calling capital in a quarter on quarterly fund age fixed effects and quarter fixed effects. The controls include a dummy for whether the GP's previous fund has a changing basis, the usual fund-level controls, and vintage year fixed effects. Standard errors are clustered at the vintage year level. Note that the sample is necessarily restricted to funds for which I observe the previous fund in the fund family by the same GP. For this test, I include funds that were previously excluded because the management fee percentage levels or basis depends on other funds managed by the GP.

Table 7 reports the results. Column 1 reports the results without vintage year fixed effects, and column 2 adds vintage year fixed effects. As can be seen, the sample size is smaller since this test requires that I observe any previous fund in the fund family. The coefficient on $PrevQ17Q28P(Call)_i$ is negative for both columns, though statistically insignificant. Overall, this result suggests that if anything, GPs that are less likely to call capital during the three years select into having a changing basis.

7 Implications

This section explores the economic significance of my main results by considering two implications.

A Trade off for LPs

My results imply that LPs may be trading off reducing fees and inducing an overinvestment problem when having a changing basis instead of a fixed basis. I document three results that are consistent with this trade off view.

The first is that having a changing basis instead of a fixed basis is associated with a 4.2% point decrease in the present value of scaled total management fees, which all-else-equal should improve net-of-fee PME by 0.08 (6.4% of the sample mean). The estimates come from the fund-level regression results in columns 1-2 of Table 8. Both regressions include the usual fund-level controls from equation 4 and vintage-year fixed effects. In column 1, the dependent variable is the present value of scaled total management fees, and the independent variable of interest is Net. As can be seen, having a changing basis instead of a fixed basis is associated with a 4.2% point decrease in the present value of scaled total management fees. In column 2, the dependent variable is net-of-fee PME and the independent variable of interest is the present value of scaled total management fees. According to the estimate, a 1% point decrease in the present value of scaled total management fees improves net-of-fee PME by 0.02.

Second, despite the positive effects on net-of-fee fund performance from reducing fees, changing basis funds on average neither outperform nor underperform fixed basis funds net-of-fee. Columns 3 and 4 reports the fund-level regression results that evaluate relative performance. For both columns, the dependent variable is net-of-fee PME and the independent variable of interest is Net. Column 3 omits vintage year fixed effects and the fund-level controls, while column 4 includes them. As can be seen, the coefficient on Net is positive but statistically insignificant for both columns.

Third, changing basis funds on average outperform (underperform) fixed basis funds net-of-fee when one evaluates the relative performance amongst funds that have low (high) levels of scaled dry powder (unused capital commitments divided by total capital commitments) at the beginning of year five of the fund life cycle. The idea here is that having low levels of scaled dry powder at the beginning of year five of the fund life cycle should limit the overinvestment activity since GPs can overinvest little if they have little dry powder left at the time. In this case, changing basis funds should outperform fixed basis funds net-of-fee since the positive effects from reducing fees dominates. Column 5 adds as a control scaled dry powder level at the beginning of year five — $Q17DP\%$ — and the interaction term with Net. As can be seen, the coefficient on Net is positive and statistically significant, indicating that changing basis funds outperform fixed basis funds net-of-fee when funds have no dry powder at the beginning of year five of the fund life cycle. The coefficient on the interaction term $Q17DP\%_i Net_i$ is negative and statistically significant, showing that the relative performance deteriorates as one increases $Q17DP\%$. Column 6 shows that this result is robust to adding the present value of scaled total manaement fees as a control.

B Sensitivity to Credit Spread

I next study the following plausible implication of my main results: while high credit spread damps the investment activities of buyout funds (Axelson, Stromberg and Weisbach (2009); Axelson et al. (2013)), the effect may be weaker for changing basis funds since the contract gives them an incentive to spend equity. It is important to test this implication since, if true, it implies that management fee contracts matter for how credit market conditions shape the investment activities of private equity firms.

To test this prediction, I study the relation between the quarterly likelihood of calling capital and credit spread and examine whether the relation differs between the two fund groups for the three subsets of the fund life cycle. I conduct the test by running a fund-quarter level regression where the dependent variable is $Call_{it}$ and the independent variable of interest is credit spread at quarter t — $HYSpread_t$ — and the credit spread variable interacted with Net. As controls, the regression includes Net, the usual fund-level controls from equation 4, and quarterly fund age fixed effects, and aggregate risk premium at quarter t. To be consistent with the literature, I use the credit spread and the aggregate risk premium measures from Haddad, Loualiche and Plosser (2017). The standard errors are clustered at the quarter level.

Table 9 presents the results. Column 1 limits the sample to quarters between quarter one to quarter sixteen of the fund life cycle, column 2 to quarters between quarter seventeen to quarter twenty-eight of the fund life cycle, and column 3 to quarters after quarter twenty-eight. As can be seen, the coefficient on $HYSpread_t$ is negative and statistically significant across all three columns. This implies that high credit spread damps investment activity for all three regions of the fund life cycle. The interaction term, however, is positive and statistically significant just for the second region. In other words, the credit spread effect on investment activity is weaker for changing basis funds, but just during the middle partition of the fund life cycle.

8 Conclusion

Around 43% of buyout funds reduce fees to GPs by having a changing basis, which ties fees to investment activity. By using a proprietary dataset, and an adequately chosen control group, I document results that suggest that this contract induces GPs to excessively call capital for fees.

This paper's findings raise a number of important future research questions. First, this paper limits the analysis to how having a changing basis affects LPs, but a question of equal importance is how having a changing basis affects GPs' portfolio companies. By giving GPs the incentive to use more equity, having a changing basis may have important implications for the financial, governance, and operational changes that GPs bring to their portfolio companies.[10] Using more equity likely reduces the tax benefits of debt, but may allow GPs to implement more costly operational and governance improvements at their portfolio companies.

[10] See Sorensen and Yasuda (2022) for a review of the literature that studies the effects of private equity ownership on portfolio company outcomes.

Second, while I document investment patterns that suggest that a changing basis induces an overinvestment problem for the average fund in my sample, I cannot say the problem arise for all funds. For some funds, the contract may mitigate the GPs' tendency to underinvest. Given this possibility, more work is needed to investigate if a more nuanced view of this compensation contract is warranted.[11]

[11]In a similar vein, Degeorge, Martin and Phalippou (2016) show that secondary buyouts are not always value-decreasing. For example, these deals perform well when GPs have complementary skills.

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Main Tables and Figures

Figure 1: Probability of Calling Capital over the Fund Life Cycle

This figure plots the dynamics of the probability of calling capital in a quarter for fixed basis funds and for changing basis funds. The numbers for fixed basis funds are sample averages from the data. The numbers for changing basis funds are obtained by adding the estimates of interaction terms from the regression result of equation 2. I use the standard errors from the regression result to make 90% confidence interval for the estimates.

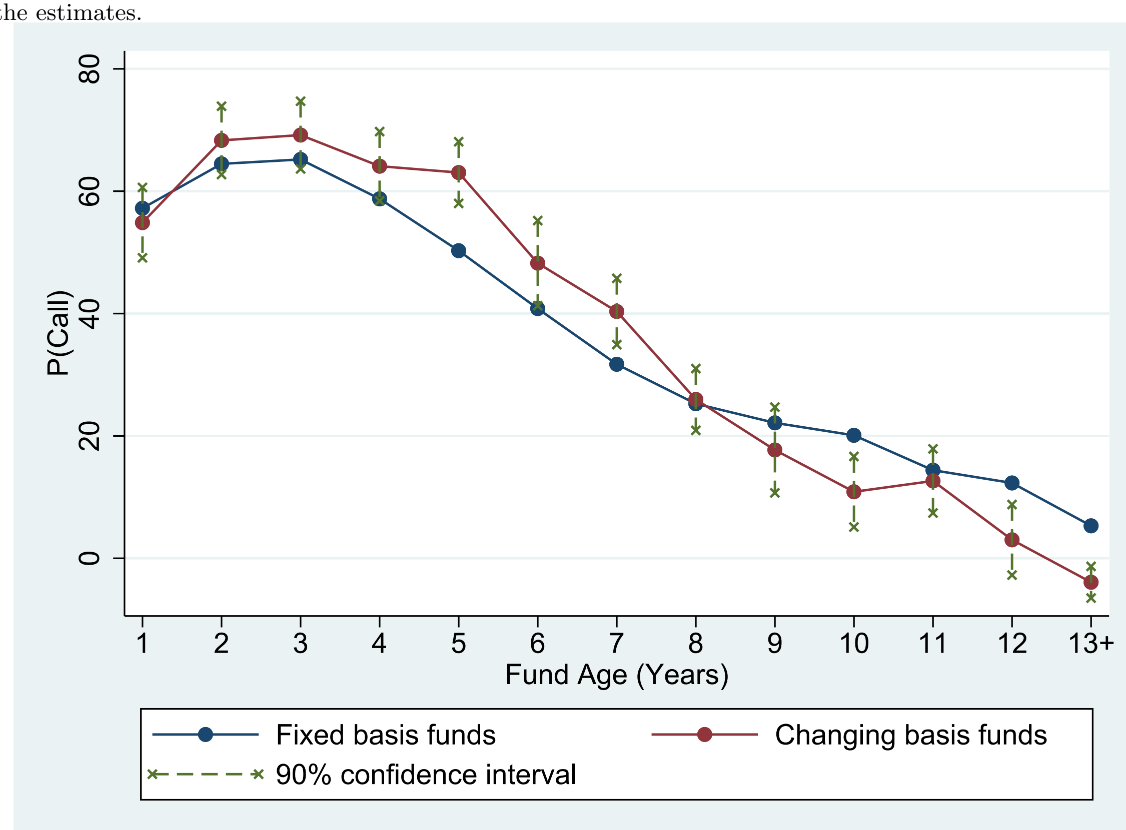

Table 1: Summary Statistics

"Database" are all buyout funds in the confidential dataset. "Baseline Sample" are my baseline sample of funds. "Fixed Basis" are the funds that keep the fee basis fixed at committed capital throughout their lives. "Changing Basis" are the funds that change the fee basis from committed capital to net invested capital. *FundSize* is the fund's committed capital in the units of million dollars. *FundNo.* is the fund's sequence number. *GP%* is the percentage of the fund's committed capital provided by the fund's GP. *Carry%* is the fund's carry percentage. *MFee%* is the fund's total management fees scaled by its committed capital, expressed as a percentage. All figures are sample means. Medians are in parentheses.

	Database	Baseline Sample	Fixed Basis	Changing Basis
FundSize ($M)	987.98	802.42	627.74	1,226.01
	(312.91)	(300.00)	(272.33)	(451.79)
FundNo.	3.07	2.94	2.80	3.29
	(2.00)	(2.00)	(2.00)	(2.00)
GP%	2.38	2.22	2.03	2.67
	(1.00)	(1.00)	(1.00)	(1.55)
Carry%	19.96	19.93	19.96	19.85
	(20.00)	(20.00)	(20.00)	(20.00)
MFee%	15.07	16.00	18.18	10.74
	(14.25)	(15.50)	(19.31)	(10.16)
Funds	542	274	194	80

Table 2: Correlated Characteristics

This table explores which characteristics correlate with having a changing basis instead of a fixed basis. Observations are at the fund level. Net is a dummy that equals one if the fund has a changing basis, and zero if it has a fixed basis. $InvH(GP\%)$ is the inverse hyperbolic sine of the fund's GP ownership percentage. $ln(FundNo)$ is the natural log of the fund's sequence number. $LowCarry$ is a dummy that equals one if the fund's carry percentage is below 20%, and zero otherwise. $HighCarry$ is a dummy that equals one if the fund's carry percentage is above 20%, and zero otherwise. $ln(FundSize)$ is the natural log of the fund's committed capital. $ln(FundRaising)$ is the natural log of the industry-level fundraising at the fund's vintage year. $HYSpread$ and $RPremium$ are respectively credit spread and aggregate risk premium at the end of the quarter previous to the fund's first quarter. Standard errors, clustered by vintage year, are shown in parenthesis. Significance at the 10%, 5%, and 1% level are indicated using *, **, and ***, respectively.

	Net_i	Net_i
$InvH(GP\%)_i$	0.0879***	0.0666**
	(0.0250)	(0.0244)
$ln(FundNo.)_i$	-0.0661**	-0.0519*
	(0.0308)	(0.0287)
$LowCarry_i$	0.338	0.239
	(0.288)	(0.252)
$HighCarry_i$	0.397***	0.476***
	(0.0248)	(0.0592)
$ln(FundSize)_i$	0.0709***	0.0643***
	(0.0152)	(0.0193)
$ln(FundRaising)_{y(i)}$		0.0460**
		(0.0206)
$HYSpread_{q(i)}$		-0.00497
		(0.0197)
$RPremium_{q(i)}$		-0.00965
		(0.00654)
FE: Vintage	X	
Mean	0.292	0.292
N	271	274
R^2	0.219	0.145

Table 3: Matching

Panel A provides summary statistics of the matched sample. $\hat{\beta}$ and $Q1toQ16P(Call)$ are as described in the main text. Panel B explores the determinants of $Q17toQ28P(Call)_i$. Standard errors, clustered by vintage year, are shown in parenthesis. Significance at the 10%, 5%, and 1% level are indicated using *, **, and ***, respectively.

Panel A: Summary Statistics

	Baseline Sample		Matched Sample	
	Changing	Fixed	Changing	Fixed
$\hat{\beta}$	0.07	0.02	0.07	0.07
	(0.10)	(0.01)	(0.10)	(0.09)
Q1toQ16P(Call)	0.04	-0.03	0.04	0.04
	(0.08)	(-0.01)	(0.08)	(0.09)
FundSize ($M)	1,226.01	627.74	1,226.01	930.06
	(451.79)	(272.33)	(451.79)	(343.43)
FundNo.	3.29	2.80	3.29	3.09
	(2.00)	(2.00)	(2.00)	(2.00)
GP%	2.67	2.03	2.67	2.32
	(1.55)	(1.00)	(1.55)	(1.00)
Carry%	19.85	19.96	19.85	19.93
	(20.00)	(20.00)	(20.00)	(20.00)
MFee%	10.74	18.18	10.74	14.24
	(10.16)	(19.31)	(10.16)	(14.00)
Funds	80	194	80	400

Panel B: Determinants

	$Q17toQ28P(Call)_i$	$Q17toQ28P(Call)_i$
$Q1toQ16P(Call)_i$	0.540***	0.523***
	(0.110)	(0.0792)
$\hat{\beta}_i$	0.321**	0.326**
	(0.123)	(0.122)
$\ln(FundSize)_i$	-0.0223	0.0708
	(0.0260)	(0.0705)
ln(FundSizeSquared)	0.00437	-0.00391
	(0.00433)	(0.00712)
$\ln(FundNo.)_i$	-0.0314	-0.0133
	(0.0551)	(0.0578)
$\ln(GP\%)_i$	-0.0168	-0.0264
	(0.0215)	(0.0202)
$LowCarry_i$	-0.00146	0.00207
	(0.304)	(0.317)
Controls	X	X
FE: Vintage		X
Mean	-0.02	-0.02
N	170	168
R^2	0.33	0.43

Table 4: Capital Call Dynamics

This table examines whether changing basis funds are more likely to call capital in a quarter than fixed basis funds when I partition the fund life cycle into three parts. Observations are that the fund-quarter level. $Q1toQ16$ is a dummy that equals one if the fund is between quarter one to quarter sixteen of the fund life cycle, and zero otherwise. $Q17toQ28$ is a dummy that equals one if the fund is between quarter seventeen to quarter twenty-eight of the fund life cycle, and zero otherwise. $Q29+$ is a dummy that equals one if the fund is at or after quarter twenty-nine of the fund life cycle, and zero otherwise. Net is a dummy that equals one if the fund has a changing basis, and zero if it has a fixed basis. The fund-level controls are as described in the text. For the sake of brevity, just the interaction terms are reported. Standard errors, clustered by quarter, are shown in parenthesis. Significance at the 10%, 5%, and 1% level are indicated using *, **, and ***, respectively.

	Baseline Sample			Matched Sample		
	Call_{it}	Call_{it}	Call_{it}	Call_{it}	Call_{it}	Call_{it}
$\text{Q1toQ16}_{it}Net_i$	0.0147	0.0256	-0.0131	-0.0260	-0.0247	-0.0893*
	(0.0188)	(0.0184)	(0.0473)	(0.0179)	(0.0175)	(0.0495)
$\text{Q17toQ28}_{it}Net_i$	0.0933***	0.103***	0.0792*	0.0947***	0.0936***	0.0946**
	(0.0183)	(0.0190)	(0.0400)	(0.0204)	(0.0204)	(0.0455)
$\text{Q29+}_{it}Net_i$	-0.0280	-0.0123	-0.0326	-0.00387	0.00745	0.0104
	(0.0192)	(0.0173)	(0.0337)	(0.0191)	(0.0181)	(0.0362)
Controls	X	X	X	X	X	X
FE: Quarter		X			X	
FE: Family-Quarter			X			X
Mean	0.408	0.408	0.383	0.418	0.418	0.412
N	11448	11448	5303	20965	20963	18119
R^2	0.536	0.233	0.596	0.553	0.255	0.823

Table 5: Performance Implications

This table studies how the quarterly likelihood of calling capital during the three years relates to fund performance. Observations are at the fund-level. PME is the net-of-fee PME from Kaplan and Schoar (2005). Net is a dummy that equals one if the fund has a changing basis, and zero if it has a fixed basis. $Q17toQ28P(Call)$ is the fund's quarterly likelihood of calling capital from quarter seventeen to quarter twenty-eight of the fund life cycle, as described in the main text. $PV(MFee\%)$ is the present value of scaled total management fees. The fund-level controls are as described in the text. Standard errors, clustered by quarter, are shown in parenthesis. Significance at the 10%, 5%, and 1% level are indicated using *, **, and ***, respectively.

	Baseline Sample		Matched Sample	
	PME_i	PME_i	PME_i	PME_i
Net_i	0.131	0.0259	0.143	0.0952
	(0.0931)	(0.116)	(0.119)	(0.123)
$Q17Q28P(Call)_i$	0.0793	0.0776	0.103	0.0937
	(0.156)	(0.167)	(0.224)	(0.224)
$Net_i Q17Q28P(Call)_i$	-0.559**	-0.539**	-0.625**	-0.615**
	(0.205)	(0.222)	(0.228)	(0.230)
$PV(MFee\%)_i$		-0.0245**		-0.0105
		(0.0110)		(0.0145)
Controls	X	X	X	X
FE: Vintage	X	X	X	X
Mean	1.26	1.26	1.22	1.22
N	215	215	397	397
R^2	0.10	0.13	0.14	0.15

Table 6: Horse Races

This table runs horse races against fund size and various skill proxies. Observations are at the fund-quartere level. $Call$ is a dummy that equals one if the fund calls capital in a quarter and zero otherwise. Net is a dummy that equals one if the fund has a changing basis, and zero if it has a fixed basis. $Q17toQ28P(Call)$ is the fund's quarterly likelihood of calling capital from quarter seventeen to quarter twenty-eight of the fund life cycle, as described in the main text. $PV(MFee\%)$ is the present value of scaled total management fees. The fund-level controls are as described in the text. Column 2 adds the interaction term of Net with the natural log of fund size, column 3 the interaction term with the natural log of fund sequence number, column 4 the interaction term with the inverse hyperbolic sine of GP ownership percentage, and column 5 the interaction term with the natural log of industry-level fundraising at vintage year. Standard errors, clustered by quarter, are shown in parenthesis. Significance at the 10%, 5%, and 1% level are indicated using *, **, and ***, respectively.

	Call_{it}	Call_{it}	Call_{it}	Call_{it}	Call_{it}
Net_i	0.0259	0.0189	0.0278	0.0320	0.0273
	(0.116)	(0.131)	(0.124)	(0.117)	(0.116)
Q17Q28P(Call)_i	0.0776	0.416	0.0441	-0.187	0.378
	(0.167)	(1.199)	(0.241)	(0.183)	(0.568)
$\text{Net}_i\text{Q17Q28P(Call)}_i$	-0.539**	-0.501*	-0.542**	-0.617**	-0.511*
	(0.222)	(0.243)	(0.232)	(0.253)	(0.250)
$\text{PV(MFee\%)}_i$	-0.0245**	-0.0254**	-0.0243**	-0.0240**	-0.0237*
	(0.0110)	(0.0115)	(0.0110)	(0.0103)	(0.0114)
Controls	X	X	X	X	X
FE: Vintage	X	X	X	X	X
Interact with Size		X			
Interact with FundNo			X		
Interact with GP Ownership				X	
Interact with Fundraising					X
Mean	1.26	1.26	1.26	1.26	1.26
N	215	215	215	215	215
R^2	0.13	0.13	0.13	0.13	0.13

Table 7: Previous Fund

This table examines how having a changing basis in the current fund relates to the likelihood calling capital from the beginning of year five to the end of year seven of the GP's previous fund. Observations are at the fund level. The sample is restricted to the funds for which I observe the GP's previous fund. *Net* is a dummy that equals one if the fund has a changing basis, and zero if it has a fixed basis. $PrevQ17Q28P(Call)$ is the likelihood of calling capital from quarter seventeen to quarter twenty-eight of the fund life cycle at the GP's previous fund, as described in the main text. *PrevNet* is a dummy that equals one if the GP's previous fund has a changing basis, and zero if it has a fixed basis. Controls are the fund-level controls described in the text. Standard errors, clustered by vintage year, are shown in parenthesis. For both panels, significance at the 10%, 5%, and 1% level are indicated using *, **, and ***, respectively.

	Net_i	Net_i
$\text{PrevQ17Q28P(Call)}_i$	-0.141	-0.244
	(0.407)	(0.381)
PrevNet_i	0.385**	0.376**
	(0.167)	(0.172)
Controls	X	X
FE: Vintage		X
Mean	0.814	0.829
N	221	217
R^2	0.113	0.167

Table 8: Trade off for LPs

This table studies whether LPs trade off reducing fees and inducing an overinvestment problem when having a changing basis. Observations are at the fund-level. The sample is restricted to funds for which I observe at least the first thirty quarters. $PV(MFee\%)$ is the present value of scaled total management fees, which is total management fees divided by committed capital. PME is the net-of-fee public market equivalent as defined in Kaplan and Schoar (2005). Net is a dummy that equals one if the fund has a changing basis, and zero if it has a fixed basis. $Q17DP\%$ is the fund's unused capital commitments divided by committed capital at the beginning of year five of the fund life cycle. The fund-level controls are as described in the text. Standard errors, clustered by vintage year, are shown in parenthesis. Significance at the 10%, 5%, and 1% level are indicated using *, **, and ***, respectively.

	PV(MFee%)$_i$	PME$_i$	PME$_i$	PME$_i$	PME$_i$	PME$_i$
Net$_i$	-4.244***		0.123	0.0923	0.438***	0.326**
	(0.317)		(0.0982)	(0.121)	(0.124)	(0.128)
PV(MFee%)$_i$		-0.0244**				-0.0261**
		(0.00913)				(0.0113)
Q17DP%$_i$					0.182**	0.197**
					(0.0734)	(0.0814)
Q17DP%$_i Net_i$					-0.470***	-0.465***
					(0.153)	(0.144)
Controls	X	X		X	X	X
FE: Vintage	X	X		X	X	X
Mean	13.99	1.26	1.26	1.26	1.26	1.26
N	215	215	216	215	215	215
R^2	0.34	0.12	0.01	0.09	0.13	0.16

Table 9: Sensitivity of Capital Calls to Credit Spread

This table studies the sensitivity of capital calls to credit spread. Observations are at the fund-quarter level. Column 1 restricts the sample to the first sixteen quarters of the fund life cycle, column 2 to quarters between quarter seventeen and quarter twenty-eight, and column 3 to quarters after quarter twenty-eight. *Call* is a dummy that equals one if the fund calls capital, and zero otherwise. *RPremium* and *HYSpread* are respectively the risk premium and the credit spread measure from Haddad, Loualiche and Plosser (2017). *Net* is a dummy that equals one if the fund has a changing basis, and zero if it has a fixed basis. The fund-level controls are as described in the text. Standard errors, clustered by quarter, are shown in parenthesis. Significance at the 10%, 5%, and 1% level are indicated using *, **, and ***, respectively.

	Call_{it}	Call_{it}	Call_{it}
RPremium_t	-0.00559**	0.00207	0.0108***
	(0.00228)	(0.00204)	(0.00223)
HYSpread_t	-0.0140***	-0.0299***	-0.00596**
	(0.00506)	(0.00449)	(0.00296)
$\text{HYSpread}_t Net_i$	-0.00224	0.0240***	-0.00507
	(0.00831)	(0.00848)	(0.00437)
Net_i	0.0260	-0.164*	0.0211
	(0.0936)	(0.0833)	(0.0519)
Controls	X	X	X
FE: QuarterAge	X	X	X
Quarter Age	1-16	17-28	29+
Mean	0.634	0.446	0.165
N	4244	2812	4391
R^2	0.079	0.109	0.112

Appendix Tables and Figures

Table A1: Capital Call Dynamics

This table reports the regression results of Equation 2. Observations are at the fund-quarter level. For brevity, just the interaction terms are reported. *Call* is a dummy that equals one if the fund call capital in the quarter and zero otherwise. *Net* is a dummy that equals one if the fund has a changing basis, and zero if it has a fixed basis. $Yr1$ is a dummy that equals one if the fund is in the first year of its life cycle, and zero otherwise. Other year variables are defined analogously. $Yr13+$ is a dummy that equals eon if the fund is in the thirteenth year of the its life cycle or afterwards, and zero otherwise. Controls are the fund-level controls described in the main text. Significance at the 10%, 5%, and 1% level are indicated using *, **, and ***, respectively.

	Call_{it}
$\text{Net}_i\text{Yr1}_{it}$	-0.0235
	(0.0351)
$\text{Net}_i\text{Yr2}_{it}$	0.0384
	(0.0340)
$\text{Net}_i\text{Yr3}_{it}$	0.0399
	(0.0337)
$\text{Net}_i\text{Yr4}_{it}$	0.0533
	(0.0345)
$\text{Net}_i\text{Yr5}_{it}$	0.128***
	(0.0307)
$\text{Net}_i\text{Yr6}_{it}$	0.0743*
	(0.0425)
$\text{Net}_i\text{Yr7}_{it}$	0.0863**
	(0.0330)
$\text{Net}_i\text{Yr8}_{it}$	0.00702
	(0.0308)
$\text{Net}_i\text{Yr9}_{it}$	-0.0443
	(0.0427)
$\text{Net}_i\text{Yr10}_{it}$	-0.0923***
	(0.0352)
$\text{Net}_i\text{Yr11}_{it}$	-0.0176
	(0.0320)
$\text{Net}_i\text{Yr12}_{it}$	-0.0929***
	(0.0352)
$\text{Net}_i\text{Yr13+}_{it}$	-0.0922***
	(0.0158)
Controls	X
FE: Quarter	X
Mean	0.408
N	11448
R^2	0.251