

Has Persistence Persisted in Private Equity? Evidence From Buyout and Venture Capital Funds

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Abstract

The conventional wisdom for investors in private equity funds is to invest in partnerships that have performed well in the past. This is based on the belief that performance in private equity persists across funds of the same partnership. We present new evidence on the persistence of U.S. private equity (buyout and venture capital) funds using a research-quality dataset from Burgiss, sourced from over 200 institutional investors. Relying on detailed cash-flow data for funds, we study the persistence of buyout and venture capital fund performance of the same general partners across different funds. We pay particular attention to persistence pre- and post-2000. Previous research, studying largely pre-2000 data, has found strong persistence for both buyout and venture capital firms. We confirm the previous findings on persistence in pre-2000 funds. There is persistence for buyout funds and, particularly, for venture funds. Post-2000, we find little evidence of persistence for buyout funds, except at the lower end of the performance distribution. When funds are sorted by the quartile of performance of their previous funds, performance of the current fund is statistically indistinguishable regardless of quartile. Performance for partnerships in all previous fund quartiles exceeds those of public markets as measured by the S&P 500. Regression results confirm the absence of persistence post-2000 except for funds in the lower end of the performance distribution. Post-2000, we find that performance in venture capital funds remains as persistent as pre-2000. Partnerships whose previous venture capital funds are below the median for their vintage year subsequently tend to be below median and have returns below those of the public markets (S&P 500). Partnerships in the top two quartiles tend to stay above the median and their returns exceed those of the public markets.

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1. Introduction

The conventional wisdom for investors in private equity is to choose funds run by managers who have performed well in the past, particularly, so-called top-quartile funds.¹ This conventional wisdom is based on the belief that performance in private equity persists across successive funds – which are typically organized as limited partnerships– with the same manager (the general partner or GP). Previous academic research, studying largely pre-2000 data, has been consistent with this conventional wisdom. For example, Kaplan and Schoar (2005) find evidence of persistence in venture capital (VC) and buyout funds raised in the 1980s and 1990s. Robinson and Sensoy (2011a) obtain similar results for a sample of buyout funds, again raised largely in the 1980s and 1990s. Chung (2012) studies buyout and VC funds raised through 2000 and finds somewhat less persistence than the other papers.

While previous work finds persistence, there is still some question about its existence. Kaplan and Schoar rely on Venture Economics data that Stucke (2011) has subsequently shown to be flawed. Robinson and Sensoy rely on fund investments of just one investor. Chung does not have access to fund-level cash flows. Most of the existing research relates to funds formed before 2000, and so misses the large increase in allocations to buyout funds as well as the large decline in allocations to VC funds since 2000. Also, from the perspective of the investors (the limited partners, or LPs), recent research by Sensoy, Wang and Weisbach (2013) finds that the ability of certain types of investors to achieve higher performance, as originally found by Lerner, Schoar and Wongsunwai (2007), has disappeared in recent years. This may reflect a reduction in performance persistence that GPs provide, thus decreasing the value of long-established relationships between LPs and particular GPs.

In this paper, we present new and more recent evidence on the persistence of U.S. buyout and VC funds using the research-quality dataset from Burgiss first used in Harris, Jenkinson and Kaplan (forthcoming). A key attribute of the Burgiss data is that they are derived entirely from LPs for whom Burgiss' systems provide record-keeping and performance monitoring services. This feature results in detailed, verified and cross-checked investment histories for nearly 1400 private equity funds derived from the holdings of over 200 institutional investors. These data

¹ For example, see Swensen (2000) and Mulcahy et al. (2012)

have now been sequenced by GP and fund type. Using detailed cash-flow data at the fund level, we study the persistence of buyout and VC performance of the same GPs across their funds.

We confirm the previous findings on persistence in pre-2000 funds. There is significant persistence for buyout funds and, particularly, for VC funds. Post-2000, however, we find markedly different results for buyout and VC. Performance persistence for buyout funds has largely disappeared since 2000. When funds are sorted by the quartile of performance of their previous funds, performance of the current buyout fund is statistically indistinguishable regardless of quartile. Moreover, returns for buyout partnerships in all previous fund quartiles, including the bottom, exceed those of public markets as measured by the S&P 500. Regression results confirm the absence of persistence post-2000 except for funds in the lower quartile of the performance distribution.

For VC funds, we find that performance persistence post-2000 remains as statistically and economically persistent as pre-2000. Partnerships whose previous VC funds are below the median for their vintage year subsequently tend to be below median and have returns below those of the public markets (S&P 500). Partnerships in the top two VC quartiles tend to stay above the median and their returns exceed those of the public markets.

We repeat our analyses with the coarser data from Preqin, another data provider. The Preqin data rely on performance reported by GPs and LPs rather than from calculations utilizing the underlying cash flows, and are potentially subject to reporting and selection biases. Nevertheless, we obtain qualitatively similar results using the Preqin data.

The paper proceeds as follows. In section 2, we discuss the data used. In section 3, we present and discuss our persistence results. In section 4, we conclude and summarize the implications of our results.

2. Data

In this paper, we use performance data for U.S. buyout and VC funds from Burgiss (as of December 2011). The Burgiss dataset “is sourced exclusively from LPs and includes their complete transactional and valuation history between themselves and their primary fund investments. The flows are rescaled to be representative of the full fund.” In other words, the Burgiss data include all funds and cash flows from the LPs that provide the data. Because the data are net of all fees and carried interest paid to the GP, our performance measures represent

the net returns to the LPs. The data come from “over 200 investment programs and represent over \$1 trillion in committed capital.” The LPs comprise a wide array of institutions with over two thirds having private equity commitments in excess of \$100 million. Of these, about 60% are pension funds (a mix of public and corporate) and over 20% are endowments or foundations.

The underlying cash flow data of the funds are likely to be extremely accurate because LPs use Burgiss’ systems for record keeping and fund investment monitoring. This “check book” data – recording the exact cash outflows made by the LPs to the GPs as well as the distributions from the GPs back to the LPs – has a number of advantages for research purposes. The fact that the data are sourced from the back-office systems used by the LPs for reporting and fund accounting, and are cross-checked across investors in the same fund, results in levels of data integrity and completeness that could not be achieved by surveys, voluntary reporting, or (largely) involuntary reporting using Freedom of Information (FOIA) requests (the main method employed by Preqin). Furthermore, when data are sourced from GPs it is possible for a GP to strategically stop reporting, or to only report on their funds selectively. The Burgiss data also are up to date – given the need for quarterly reporting by most investors – and so there are no problems resulting from a lack of updating as there can be with other commercial databases. In other words, for a given LP, there is unlikely to be any selection bias. This is an advantage over other commercial sources whose data rely on voluntary and FOIA disclosures by GPs and LPs.

The potential bias in the Burgiss data – which it shares with the other commercial sources – is how representative the LPs (and resulting GPs) are. For example, it is possible that the LPs in the Burgiss sample have had better than average experience with private equity, which is why they use Burgiss and allow Burgiss to aggregate their results. However, the results in Harris et al. (forthcoming) suggest that this bias is not present. Harris et al. (forthcoming) provide a more detailed discussion of the Burgiss data, its advantages, and how it compares to other samples.²

In this sample, Burgiss identify the GP and the sequence number of each fund. This allows us to determine whether the GP is investing its first fund or has raised prior funds. Burgiss also identifies the type of fund. For example, some buyout fund GPs have both large-cap and small-cap buyout funds; and some VC fund GPs have both early-stage and later-stage VC funds.

² Harris et al. (forthcoming) use cash-flow data up to the end of March 2011. This paper uses cash-flows up to the end of 2011, and so provides an update to the performance analysis. Additional funds have been added to the Burgiss data set, and so the sample size in this paper is somewhat larger.

Because the characteristics and the partners of the different types of funds can vary, we look at persistence across the same fund type offered by the same GP, not across the entire GP. We also eliminate 27 annex funds and side funds. Annex funds are funds that extend an existing fund. Side funds are invested side-by-side with the main fund and have the same performance. Our results are qualitatively identical if we include these funds.

Our results aggregate performance for funds in a particular fundraising (vintage) year. Burgiss classifies a vintage year as the year in which a fund first draws capital from its LPs. We report performance for vintages from 1984 through 2008. We do not report vintages after 2008 because those funds are newly invested and, therefore, are unlikely to have had sufficient time to deliver meaningful performance. Relatively few funds have available data pre-1984.

Table 1 provides summary information on the 1459 funds in our sample, by vintage year. Panel A focuses on the 607 buyout funds. For 285 of these funds we have the performance of the prior fund in the sequence. The difference comprises (a) 142 first-time funds and (b) 180 funds (which were not first-time funds) for which Burgiss lacks prior fund performance information. The latter reflects the fact that our data are derived entirely from investors – who do not necessarily invest in every fund offered by a GP – which inevitably leads to gaps in the fund sequences. Nevertheless, our sample is considerably larger than the 76 funds with prior performance history in Kaplan and Schoar (2005). Overall, these funds represent committed capital of roughly \$700 billion, of which around \$400 billion was committed to the 2005 to 2008 vintage years.

Panel B focuses on the 852 VC funds in the sample, which raised roughly \$225 billion in total. Prior fund information is available for 436 of these funds. We also have information for 156 first-time funds and 260 non-first-time funds for which we lack prior fund performance. Kaplan and Schoar's sample comprised 323 VC funds. As is well known, the number of VC funds, and total commitments to VC, peaked in 2000.

Table 1 also reports the unrealized portion of the funds remaining, as at the end of 2011, as a percentage of the total value (unrealized plus already realized) for an LP in the fund. invested capital in the fund value. For both buyout and VC funds, vintage years before 1999 are largely realized, with unrealized values representing less than ten percent of total fund value. More recent vintage funds have significant unrealized proportions, averaging over 50% for buyout funds (VC funds) for vintage years after 2004 (2003).

While we would prefer the recent funds to be more fully realized, the unrealized values should approximate true market values. Since the end of 2009, topic 820 of the Financial Accounting Standards Board (FASB) has required private equity firms to value their assets at fair value every quarter, rather than permitting them to value the assets at cost until an explicit valuation change. This has likely had the practical effect of making estimated unrealized values closer to true market values than in the past, particularly for buyout funds. Jenkinson et al. (2013) using data from Calpers (the California Public Employees Retirement System, one of the largest pension fund LPs) and Brown et al. (2013) using data from Burgiss, suggest that, on average, unrealized values are, if anything, conservative.

The lack of seasoning for the more recent funds does not affect our results. We obtain qualitatively and statistically similar results when we exclude more recent vintages – those after 2005. Nevertheless, we recognize that the analysis of those funds is subject to change in the future.

We report average performance by vintage year using three measures. The internal rate of return (IRR) is computed using the timed cash flows into and out of the fund, treating the remaining unrealized NAV as a final positive cash flow. The multiple of invested capital (MOIC) is the ratio of the sum of cash distributions plus remaining NAV to the cash invested in the fund. The IRR and MOIC are the standard performance measures used by PE practitioners. The third measure is the public market equivalent return (PME), which measures performance relative to a market index. We follow the approach of Kaplan and Schoar (2005) in calculating PMEs.

Table 1 also reports the performance measures for our sample. For buyout funds, the average net IRR across the sample is roughly 12% per annum, with an average MOIC of 1.56. Buyouts have consistently out-performed public markets (measured using the S&P 500 index), with the average PME being 1.26 across the sample. Indeed, for each vintage year since 1989 the average PME has been at least 1. Performance is somewhat lower in the second half of the sample. Overall, the performance of buyouts is slightly higher than reported in Harris et al. (forthcoming), reflecting updates from early 2011 to the end of 2011 (as the more recent funds matured) and additions to the sample.

For VC funds, average performance peaked for vintage years in the mid-1990s, returning 2.1 to 3.8 times more than public markets (although capital committed was relatively small).

Average performance was poor from 1999 to 2003, particularly for the much larger vintages of 1999 and 2000. Those funds have produced IRRs of roughly 0% with PME's less than 1. From 2004 onward, performance has improved modestly with single digit IRRs and PME's slightly above 1. Because of the extraordinary returns in the mid-1990s, over the entire period performance according to all three measures is somewhat better for VC than buyouts.

In the final columns of Table 1, we present average performance for the subset of funds for which we have the previous fund's performance. Trends across these figures are similar to the full-sample results, with differences in performance reflecting to a great extent the performance of first-time funds. We return to this issue in more detail later.

Investors usually focus on relative performance when evaluating funds, often by analyzing performance quartiles by vintage year. In Table 2, we report average returns for the funds in each performance quartile. For each vintage year, we place each of the funds in our sample in a performance quartile. We do this separately for buyout and VC funds, and for each performance measure.

Panel A shows that top quartile buyout funds have average PME's of 1.82 compared to average PME's of 0.79 for bottom quartile funds. The analogous annualized IRRs are 27.1% and -3.0%. These are large differences. As noted earlier, average returns are somewhat lower in the second half of the sample, and so we also report the average performance by quartile for pre-2001 and post-2000 buyout funds. The PME differential between top and bottom quartiles is greater for pre-2001 funds at 1.33 than for post-2000 funds at 0.82. The IRR and MOIC differentials also are noticeably greater for pre-2001 funds.

Panel B shows that the differentials between top and bottom quartile funds have been much larger for VC funds than for buyout funds. Top quartile VC funds have average PME's of 2.56 compared to just 0.49 for bottom quartile funds. The analogous annualized IRRs are 42.9% and -10.1%. The PME, IRR and MOIC differentials between top and bottom quartiles are substantially greater for pre-2001 funds.

These results confirm that it would be very valuable to be able to predict and invest in those funds that will end up in the top two quartiles while avoiding funds that will end up in the bottom two quartiles. In the next section, we consider whether past performance helps investors make that prediction.

3. Persistence

In this section, we present several different analyses of persistence. The analyses mainly focus on the PME performance measure, although we also show results for IRR and MOICs. The PME is effectively a market-adjusted multiple of invested capital. It measures how an investment in a private equity funds compares to an investment in public equities. Korteweg and Nagel (2013) and Sorensen and Jagannathan (2013) provide theoretical descriptions and justifications for PME. According to Sorensen and Jagannathan (2013), the PME “remains a valid economic measure of performance regardless of the risk of the capital calls and distributions.”

We measure public equity performance with the return on the S&P 500. A PME of 1.5, for example, implies that an investor in the fund earned a total of 50% more over the life of the fund than if the investor had left its money in the S&P 500. (Our results are qualitatively similar when we use the returns on the Russell 2000, an index for smaller capitalization stocks.) The IRR and MOIC do not adjust for stock market movements and, therefore, vary meaningfully across periods of different market returns. While we focus on PME, our persistence results are generally qualitatively similar when we sort on and use IRR and MOIC.

A. Persistence by Quartiles – Previous Fund

In this section, we consider the conventional wisdom of investing in funds run by GPs whose previous funds were top quartile, as measured by PME. Taking the performance rankings (as reported in Table 2), we consider whether investors can use this information to improve their choice of funds. This strategy is not strictly feasible in practice, as the current PME, not the final PME, is known when a GP raises a subsequent fund. Brown et al. (2013) and Jenkinson et al. (2013) study the interaction of fundraising and interim performance, and find that interim performance is a meaningful, but imperfect measure of final performance. Accordingly investors observe – at the time they are asked to commit to a follow-on fund, some 3 to 5 years into the life of the current fund – a noisy signal of ultimate performance. Our analysis, then, evaluates how useful past performance is, or would have been once it was ultimately known, when predicting future performance. As such, it represents an upper bound on the extent of persistence and the usefulness of past performance in practice.

Once we have performance benchmarks for each vintage year, we sort all funds into one of six groups. We place funds in groups one to four based on the past performance quartile of its prior fund (as of December 2011) if such performance is available. If performance of the prior fund is not available, we place the fund into a fifth group if the fund sequence number is greater than one, i.e., it does not appear to be a first-time fund. We place the fund into a sixth group of first-time funds if its fund sequence number is equal to one.

(i) *Buyout Funds*

Panel A of Table 3 reports the crosstabs of PME quartiles of subsequent buyout funds relative to the four PME quartiles and two other classifications of the previous fund. The panel also reports the average IRR, MOIC and PME for the six different groups. For the sample as a whole there is modest persistence in buyout fund performance. Funds with a previous fund in the top quartile are in the top quartile 27.5%, and above median 55%, of the time. Funds with a previous fund in the bottom quartile remain in the bottom quartile 29.4%, and below the median 60.8%, of the time. Bottom-to-top quartile flips across successive funds occur less than 20% of the time, in either direction. A chi-square test for equality of the four previous fund quartiles is not rejected at the 10% level nor is a test of the equality of the top and bottom previous fund quartiles. These results contrast with those found of Kaplan and Schoar (2005) who found higher levels of persistence.³

In the last three columns of Panel A, we report the average performance of funds according to our 6-way classification. Funds with a prior fund in the top quartile have an average PME of 1.34 while those whose prior fund was in the bottom quartile have an average PME of 1.10. The difference in means is significant at the 1% level. Funds previously in the second and third quartile have average PMEs for their current fund that are lower than those in the top quartile and higher than those in the bottom quartile, but those differences are not significant. Funds that are missing previous fund performance, both first-time funds and non-first time funds, have average performance that is between that of the previously top quartile and second quartile funds.

These results have several implications. First, if one had been able to know *ex ante* the previous funds that would ultimately be in the top quartile, it would have been a good strategy to

³ As their sample size was smaller, Kaplan and Schoar analyzed performance according to terciles.

invest in these funds. That is consistent with the conventional wisdom. Relative to a randomized strategy of investing in buyout funds where the average PME is 1.24, a PME of 1.34 implies that the average increase in PME to be achieved from such prescience would have been 0.10. The analysis in Harris et al. (forthcoming) suggests this translates into annualized outperformance of 2% to 2.5%.

Second, the persistence in performance is somewhat more noticeable at the bottom end of the distribution. Avoiding previously bottom quartile funds is clearly important, and in our data set the attrition rates for follow-on funds are higher for bottom quartile funds. This may reflect exit by that GP, or, alternatively, a decision by the LPs in our sample to avoid subsequent funds. This is consistent with the results in Kaplan and Schoar (2005) and Chung et al. (2011) that the ability to raise a subsequent fund is significantly related to past performance. However, investors do not shun bottom quartile funds *en masse*, given that we have performance data for a significant number of follow-on funds.

Third, the average performance of first time buyout funds is above median. This suggests that investors should not avoid GPs simply because they do not have a track record.

In the remainder of Panel A of Table 3, we report the analogous results for funds raised before 2001 and after 2000. U.S. buyout funds exhibited stronger top-quartile persistence in the pre-2001 period than in the sample overall. Funds previously in the top quartile are in the top quartile 37.5%, and above median 62.5%, of the time. As a result, investing in funds whose prior fund was top quartile delivered significantly higher next fund performance: PMEs for this group average 1.48. This is noticeably higher than the performance for all the other groups, and significantly greater than the PME of 1.12 for funds previously in the bottom quartile.

Top end persistence, however, has weakened post-2000. Funds previously in the top quartile are in the top quartile only 22%, and above median 50.8%, of the time. Funds previously in the top quartile have average PMEs that are only 0.02 greater than those in the second quartile, and are actually lower than those for first-time funds. Noticeable persistence appears to remain in the bottom quartile: funds previously in the bottom quartile remain in the bottom quartile 32.1%, and below median 64.2%, of the time. The difference in the average PMEs of the bottom quartile funds (1.09) versus the top quartile funds (1.26) is economically, but not statistically, significant. (A difference in PMEs of 0.17 is equivalent to more than 3% per year.)

In unreported analyses, we find that the results for the post-2000 period are qualitatively similar when we exclude funds raised after 2005. This suggests that our results are not driven by the younger age and lower realizations of the post-2000 funds.

In summary, in terms of quartile PME performance, our results suggest that top quartile performance persistence across successive buyout funds has essentially disappeared post-2000. Some bottom quartile persistence remains. The conventional wisdom that it is worth investing in buyout funds only if one can access previously top quartile managers has not been sound advice post-2000. Such an investment strategy would do slightly better than investing randomly. At the same time, it is worth noting that such random investing in buyout funds would result in average returns that would exceed the S&P 500. Indeed, funds in all six groups have average PMEs that exceed one, i.e., average performance exceeds that of the S&P 500. And this is true in both sub-periods.

(ii) *Venture capital funds*

Panel B of Table 3 repeats the analysis for the VC funds in our sample. The results are quite different from those for buyout funds. For the entire sample, there is marked persistence in VC fund performance. Funds with a previous fund in the top quartile are in the top quartile and above median, respectively, more than 48% and 65% of the time. Bottom-to-top quartile flips occur less than 15% of the time, and top-to-bottom flips are even less likely: occurring less than 11% of the time. The differences between the top and bottom quartile are significant at the 1% level (chi-squared test).

Funds previously in the top quartile have an average PME of 2.26 while funds previously in the bottom quartile have an average PME of only 0.79. The difference in means is significant at the 1% level. Bottom quartile funds also have a much higher attrition rate in our sample: 132 VC funds whose previous funds were top quartile are in our sample, but there are only 81 funds whose previous funds were bottom quartile. Funds in the second and third quartile have significantly lower average PMEs than those in the top quartile, and significantly higher than those in the bottom quartile. First-time funds have average performance roughly equal to the average performance of funds in the second quartile. Funds that do not have previous performance but are not first-time funds have average PMEs between those of third and fourth quartile funds.

It is worth noting that, across the whole sample, funds in the top three quartiles have average PME's that exceed one. This, too, is at odds with the conventional wisdom that only top quartile VC funds have beaten the S&P 500. But, as we show below, this result is driven by very strong performance of VC in the pre-2001 period.

This strong persistence of VC fund performance remains when the sample is split into funds raised before 2001 and after 2000. In both periods, the probability of repeating top quartile performance is above 48%. However, the probability of repeating bottom quartile performance has fallen noticeably, from around 46% to around 29%, as has the probability of repeating below median performance, from roughly 72% to 63%.

In both sub-periods, the best average performance by far is associated with the GPs whose prior fund was top quartile. However, the average performance of VC funds is much lower after 2000. Whereas the average IRR for the top quartile funds was around 48% for the pre-2001 funds, this declined to only 12% for later funds. Average top quartile PME's dropped from 2.79 to 1.49. In both periods, however, the average performance of previously top quartile funds is significantly higher than the other groups. Therefore, although VC performance has continued to be persistent in relative terms, the absolute performance of the asset class has fallen considerably. Indeed, for the post-2000 funds, the median PME is only 0.96. When we sort funds into our six groups, the average PME's of the bottom two quartiles along with those where we lack the prior fund information, are all less than one. Interestingly, recent first time funds perform more strongly – with an average PME of 1.08 – and in line with funds previously in the second quartile.

The results in panel B also challenge the conventional wisdom that it is worth investing in venture capital only if one can access previously top quartile managers. In both sub-periods, VC funds previously in the second quartile outperform the S&P 500, although the outperformance (at 1.07) is modest post-2000.

In summary, performance persistence measured by quartile rankings is very different for buyout and VC funds. For buyout funds, the average performance persistence has largely disappeared since 2000, particularly for previously top-quartile performers. Even if one could invest on the basis of past fund out-performance, this strategy would no longer earn significantly higher returns for investors. In contrast, the persistence of top-quartile VC fund performance has

remained stable, and the importance of having access to such funds has remained valuable as the average returns to the asset class have fallen significantly post-2000.

(iii) Sensitivity

In this section, we analyze the sensitivity of our results to different performance measures, absolute measures of performance (rather than quartiles), excluding more recent funds, and a different dataset.

Our analysis so far has focused on performance as measured by PME, as we consider this to be the most meaningful metric. Industry practice, however, continues to focus on IRRs and MOICs. Accordingly, in Table 4, we repeat our persistence analyses in Table 3 using IRRs and MOICs. The patterns are qualitatively similar to the patterns using PMEs.

For buyout funds, when we measure performance by IRR, the probability of repeating top quartile performance in successive funds falls from around 39% prior to 2001 to 19% thereafter. Using MOIC, top quartile persistence falls from 30% to 19%. Bottom quartile persistence increases using IRRs from 25% to almost 30% while it remains roughly the same at 29% using MOICs.

For venture capital funds we continue to find strong persistence for all performance measures. For the entire sample, top quartile persistence remains at 47% using IRR and at 49% using MOIC. And that persistence is similar for pre-2001 and post-2000 funds.

In our second sensitivity test, we classify performance quartiles in a different way. While it is common practice in the private equity industry to compare the performance of funds raised in the same vintage year (and produce quartile rankings based on the performance of those funds), an alternative approach is simply to measure performance in absolute terms and to see whether such levels of performance are persistent across successive funds. For this analysis we sort previous funds on PME and segment into four groups. We designate top-performing funds to have PMEs above 1.50; our second (third) category includes funds with PMEs between 1.25 and 1.50 (1.0 and 1.25); and funds in the bottom group have PMEs below 1.0. Of course, this does not control for macroeconomic factors that might produce a particularly favorable or unfavorable environment for investing, as it ignores the vintage years of the funds. On the other hand, vintage years are themselves a far from perfect control for such timing effects, and arguably investors should be most interested in funds that can repeat good performance, relative to public markets,

over time. We report the results in Appendix Table 1. For both buyout and VC funds, we obtain qualitatively similar results on persistence patterns to those found using quartile sorts.

Our third sensitivity test relates to the treatment of unrealized investments. In our analyses, we exclude funds with vintage years after 2008. However, the more recent funds in our sample are largely unrealized. Consequently, we repeated our analyses excluding 2007 and 2008 vintages as well as excluding 2006, 2007 and 2008 vintages. We obtain qualitatively similar results for both buyout and VC funds.⁴ This suggests that the results are not likely to be explained by the fact that some of the post-2000 funds are not fully realized.

Finally, while we utilize the research-quality Burgiss data, with its detailed cash-flow information, it is possible that the sample of funds in Burgiss is in some way atypical of the industry. This seems unlikely, given that the Burgiss data is sourced from over 200 investors. Nevertheless, we repeat our analysis using the publicly-available Preqin dataset that is largely sourced from Freedom of Information Act (FOIA) requests.⁵ Because the main Preqin dataset only includes summary performance measures, and not the underlying cash-flows, we are unable to calculate PMEs. Instead, we perform the analyses using IRRs and MOICs.

We present the transition matrices between successive funds in Table 5. The results are consistent with those reported earlier for the Burgiss data. For buyout funds, the Preqin dataset shows a pattern of persistence over the entire sample. Funds previously in the top MOIC quartile have average MOICs of 1.97 compared to 1.41 for funds previously in the bottom quartiles.

As in the Burgiss data, for buyout funds persistence declines from pre-2001 to post-2000, particularly at the top. Before 2001, almost 65% of previously top MOIC quartile buyout funds are above median. After 2000, fewer than 54% of previously top quartile funds are above median. In the earlier period, funds previously in the top MOIC quartile have average MOICs of 2.60 compared to 1.56 for funds previously in the bottom quartile funds. In the later period, the respective MOICs are 1.50 and 1.28, a difference of only 0.22. The difference in the post-2000 period is virtually the same as the 0.19 difference in the Burgiss data.

For venture capital funds, there is somewhat less first quartile persistence across the whole sample than in the Burgiss data. VC funds previously in the top MOIC quartile repeat roughly 40% of the time compared to 49% of the time in the Burgiss data. As in the Burgiss

⁴ These results are available on request.

⁵ A discussion of the differences across the various private equity datasets can be found in Harris et al. (2013)

data, however, the level of persistence is roughly the same 40% both pre-2001 and post-2000. We hypothesize that the lower average level of persistence may reflect the way Preqin gathers data. Post-2000, some leading VC funds started refusing to accept money from public pension funds that were subject to FOIA requests. As a result, some of the most well-established and successful VC funds that would be included in the Burgiss sample are not present in the Preqin sample.

B. Persistence by Quartiles – Second Previous Fund

It is possible that the current and previous funds of a private equity GP include investments in the same company. If some of these investments are particularly successful or unsuccessful, they might mechanically induce persistence across current and previous funds. Investments are much less likely to coincide in the current fund and the second previous fund. Furthermore, LPs are asked to commit to the next fund when the current fund is only partially realized (and not even completely invested). In most cases, however, prospective LPs will be able to observe the performance of the second previous fund, or at least the remaining unrealized investments will constitute a relatively small proportion of the overall fund. In other words, investing in funds whose second previous funds are top quartile is an investable strategy. The question is whether performance persists across those funds. Accordingly, Table 6 repeats the analysis presented in Table 3 using the second previous fund. Inevitably, this results in a smaller sample size, as we lose all 2nd funds from our analysis (in addition to first-time funds).

(i) Buyout funds

Across the whole sample of buyout funds, Panel A shows little if any persistence from the second previous fund to the current fund. Funds with second previous funds in the top quartile have the highest average PME (1.36), but this is not significantly different from the averages for any of the other quartiles.

Again, there is a large difference between pre-2001 and post-2000 funds. Before 2001, buyout funds with second previous funds in the top quartile did very well, with an average PME of 1.78 and 73% of those funds had above median performance. It is curious that the weakest subsequent returns are for those whose second previous fund was in the second quartile; this applies in the whole sample and in the sub-samples. Given the relatively strong performance of

the previously 3rd and 4th quartile funds, this suggests that persistence was mainly apparent in the top quartile for pre-2001 buyout funds.

For the post-2000 buyout funds, we find no evidence of second previous fund persistence. Funds with second previous funds in the top quartile have an average PME of 1.19 and fewer than 46% of those funds had above median performance. Funds with second previous funds in the third and fourth quartiles have higher average PMEs although the differences are not significant.

It is worth adding, that poorly-performing buyout funds do have a harder time raising next funds. There are three times as many funds that had top quartile second previous funds as there are funds that had bottom quartile second previous funds.

(ii) *Venture Capital funds*

Panel B of Table 6 performs a similar analysis for VC funds. Across the whole sample, funds with second previous funds in the top quartile have the highest average PME (2.25, which is significantly different from averages for the other quartiles) and more than 67% had performance above the sample median. In contrast, fewer than 41% of VC funds with second previous funds in the bottom quartile outperformed the median. The average PMEs of the previous top quartile funds are significantly greater than those of the previous bottom quartiles funds.

We find a similar pattern for pre-2001 VC funds. Funds with second previous funds in the top quartile have the highest average PMEs while funds with second previous funds in the bottom quartile have the lowest average PMEs. The average PME of the second previous top quartile funds is significantly greater than that of the second previous bottom quartile funds.

There is still persistence in VC across second previous funds after 2000, but it is concentrated in the bottom quartile. VC funds with second previous funds in the bottom quartile have the lowest average PME and fewer than 30% are above median. The average PME of the previous top quartile funds is significantly greater than that of the previous bottom quartile funds. At the same time, however, the performance of funds whose second previous funds were in the top quartile is not significantly different from that of funds whose second previous funds placed in the second and third quartile. In fact, the mean PME when the second previous fund was in

the top quartile is lower than the average when the second previous fund fell in the second quartile.

Overall, then, there is clear persistence in VC performance related to the bottom quartile of second previous funds in both sub-periods. Performance persistence following top quartile second previous funds is less clear.

C. Persistence Regressions: PME_{it} versus previous fund PME_{it-1}

To this point, we have focused on transition probabilities between performance groupings, variously defined. While this is common practice among practitioners, a simple alternative approach is to use a linear regression, relating current performance to past performance. This also allows for the introduction of controls for other factors that might affect how fund returns evolve over time for a particular GP. In this section, we estimate regressions using log PME to measure performance (reflecting the fact that the distribution of PME is right skewed) and various measures of fund size. The regressions include vintage year dummy variables for both the current and previous funds. This approach measures persistence across the whole sample of funds, rather than focusing on particularly good (or bad) performers.

(i) Buyout Funds

Panel A of Table 7 reports previous fund performance regressions for the whole sample period; Panels B and C repeat the analyses, respectively, for pre-2001 and post-2000 vintage funds. For the whole sample of buyout funds, previous fund PME is significantly related to current fund PME. The coefficient in column 1 implies that a 10% increase in the previous fund's PME is associated with a 2.7% increase in the current fund PME. For pre-2001 vintages, the previous fund PME is again significantly related to current fund performance with a coefficient of 0.293; for post-2000 vintages, the previous fund PME is related to current fund performance with a similar and statistically significant coefficient of 0.280. In contrast to the decline in persistence we find using previous fund quartiles, these results imply that persistence has been roughly constant over time for buyout funds.

However, as we observed with the earlier quartile transitions, there has been a noticeable difference in persistence for the lower and higher performing funds. To investigate this further, we look at persistence separately for the funds where the prior fund had a $PME < 1$ (67 funds

satisfy this criterion) and so have under-performed public equity markets, and those with a PME of 1 or higher. This represents roughly the bottom quartile of fund PMEs. The results are reported in the second column of Table 7. We find that the Panel A results for the whole sample period sample are driven by significant persistence in the earlier period for the better performing funds (Panel B), and in the later period (Panel C) by persistently poor performance by the funds with PMEs below 1. Overall, performance persistence for all but the bottom quartile of buyout funds has disappeared since 2000, consistent with our earlier results based on quartile transitions.

Also consistent with the quartile results for second previous funds, the regressions in the third column of Table 7 fail to find a significant relation between current fund PME and the PME of the second previous fund either in the entire sample or in the two sub-periods. The regressions in the fourth column obtain a similar result when previous fund PME also is included.

The fifth and sixth regressions include measures of fund size. Some LPs believe that increases in fund size lead to poor subsequent performance. Other LPs believe that larger funds do not perform as well as smaller funds. Column five includes the (log) change in fund size from the previous fund. Column six includes the (log) of current fund size. Somewhat surprisingly, neither size variable is statistically significant in the overall sample or in the two sub-periods. These results are similar if we divide previous fund PME into those below and above 1.0.

Overall, then, the regression results are largely consistent with those in the quartile analyses. For buyout funds, there is persistence in the overall sample and in both sub-periods, but that persistence has declined post-2000. At the same time, we find no evidence that fund size and changes in fund size are associated with buyout fund performance.

(ii) Venture Capital Funds

The right half of Table 7 reports regression results for VC funds. For the entire sample period, Panel A shows that previous fund PME is significantly related to current fund PME. The coefficient in the first VC regression implies that a 10% increase in the previous fund PME is associated with a 3.4% increase in the current fund PME. This is greater than the coefficient for buyout funds, albeit not significantly so. When we split the sample according to the vintage year, the results are similar. For the pre-2001 vintage year funds (Panel B), the previous fund PME is again significantly related to current fund performance with a coefficient of 0.365. For the post-

2000 vintage year funds (Panel C) the previous fund PME is related to current fund performance with an insignificantly smaller, and still statistically significant coefficient of 0.281.

Unlike the results for buyout funds, the results for VC are not sensitive to partitioning the previous fund PME variable based on prior fund performance. The coefficients are essentially identical for the poorly performing prior funds ($PME < 1$) and for those that beat public market returns. Comparing the sub-periods, persistence does not vary significantly according to prior fund performance, but falls slightly in the more recent post-2000 period (Panel C).

For VC funds, there is a significant relationship between the second previous fund PME and the current fund PME. The coefficient of 0.167 for the entire sample period (Panel A) means that a 10% increase in the second previous fund PME is associated with a 1.7% increase in the current fund PME. The magnitude of the coefficient is similar in both sub-periods, although it is not significant for the pre-2001 vintages.

The fifth and sixth VC regressions include measures of fund size. The coefficient on the (log) change in fund size from the previous fund is not significant; however, the coefficient on the (log) of current fund size is positive and statistically significant in the overall sample and for both sub-periods. This finding indicates that larger VC funds are associated with higher PMEs and is not consistent with larger funds leading to lower returns in the cross-section. At the same time, however, this relation between fund size and VC performance has declined in the later sub-period (Panel C).

D. Persistence Regressions: PMEs versus previous fund quartiles

In this section, we estimate regressions to explain current fund PMEs using the previous fund PME quartile. The excluded variable is previous fund in the top quartile with dummy variables representing the other quartiles. The coefficients on the dummy variables measure the difference in PME from the PME of a fund that was previously in the top quartile. The regressions also include vintage year dummy variables for the current fund and dummy variables for first-time funds as well as funds that are not first-time funds, but for which we do not have previous fund performance information.

(i) *Buyout Funds*

The first regression in Table 8 Panel A shows that top quartile funds have the highest average PME as reflected in the negative coefficients for other fund groupings. However, previous 2nd and 3rd quartile funds, as well as first-time funds and funds without previous return information, do not perform significantly worse than top quartile funds. Only bottom quartile funds significantly underperform the top quartile funds as indicated by the significant negative coefficient of -0.194.

In pre-2001 vintages, top quartile funds outperform 4th quartile funds and first-time funds, although statistical significance is marginal. In the post-2000 vintages, however, top quartile funds do not significantly outperform any of the other quartiles or fund categories. In fact, post-2000 none of the fund categories is significantly different from another for buyouts.

(ii) *Venture Capital Funds*

Panel B of Table 8 presents the analogous regressions for VC funds. The first regression shows that funds previously in the top quartile have the highest average PMEs and have performed significantly better than all other fund categories. Moreover, funds previously in the second and third quartile have significantly outperformed funds in the bottom quartile.

For the most part, the patterns for VC funds are qualitatively similar for pre-2001 and post-2000 vintages. The primary exception is that post-2000 the difference between funds that were previously in the top quartile and the other funds is economically smaller. These findings add to the consistent evidence, viewed through multiple empirical lenses, that persistence has persisted in VC.

E. *Persistence Regressions: PMEs versus previous fund PMEs with GP fixed effects*

Finally, we estimate regressions of PMEs versus previous fund PMEs using GP fixed effects. This allows us to examine GPs' track records in sustaining performance from one fund to the next. We also include vintage year fixed effects to control for the impact of economic and market conditions on returns.

(i) *Buyout Funds*

Panel A of Table 9 reports the regression results for buyout funds. Current fund PMEs are consistently negatively related to previous fund PMEs although the relationships are statistically significant only post-2000. The negative coefficients suggest that there has been regression to the mean for individual GPs since 2000. In other words, since 2000, GPs who perform particularly well in one fund perform less well in the next fund. The regressions also indicate that increased fund size by a particular GP is associated with worse subsequent performance in the earlier pre-2001 period, but does not appear to have any effect in the later, post-2000 period.

Combined with the results in the earlier regressions that do not include fixed effects, these results indicate that buyout funds that were previously high (low) performers perform better (worse) than the average fund in subsequent funds, but do not attain the same level of superior (inferior) performance as they did previously.

(ii) *Venture Capital Funds*

Panel B of Table 9 reports the regression results for VC funds. Current fund PMEs are negatively related to previous fund PMEs in both sub-periods. As with the buyout funds results, the negative coefficients suggest that there is some regression to the mean for individual GPs. In other words, GPs who perform particularly well in one VC fund perform less well in the next fund. The regressions also indicate that increased fund size by a particular GP is not associated with a decline in performance.

Combined with the results in the earlier regressions that do not include fixed effects, these results indicate that, for both buyouts and VC, funds that were previously high (low) performers perform better (worse) than the average fund in subsequent funds, but do not attain the same level of superior (inferior) performance as they did previously. This line of research could be fruitful in the future, if information on the continuity of investment professionals between the funds of a particular GP could be identified.

4. Summary and Implications

In this paper, we have used detailed cash-flow data to study the persistence of buyout and VC fund performance over successive funds. We confirm the previous findings that there was significant persistence in performance, using various measures, for pre-2000 funds – particularly for VC funds.

Post-2000, we find that persistence of buyout fund performance has fallen considerably. When funds are sorted by the quartile of performance of their previous funds, performance of the current fund is statistically indistinguishable regardless of quartile. At the same time, however, the returns to buyout funds in all previous performance quartiles, including the bottom, have exceeded those of public markets as measured by the S&P 500.

Regression estimates on the full sample of funds find that current fund performance is significantly related to previous fund performance, but the magnitude of the relation is much weaker than in the earlier period and is associated with poorly performing funds, which have tended to repeat their poor performance relative to other funds. This results in a puzzle: what motivates investors to continue to fund buyout GPs whose past performance is well below that of their peers? Perhaps this occurs because investors do not know the ultimate current fund performance (which we can observe looking back at the data) when they make the decision whether to commit to the next fund. Whether there is a systematic difference between interim and subsequent performance for the poor performers – relative to the majority of buyout funds – warrants future research.

Our results have interesting implications for buyout fund investors. First, the decline in buyout fund persistence combined with a continuation of above public market returns for buyout is consistent with at least two explanations. It is possible that the buyout business has changed, with operating engineering becoming increasingly important (see Kaplan and Stromberg (2009)). Some general partners adjusted while others did not. Alternatively, it is possible that general partners learned from each other and that has led to the reduction in persistence.

Second, the decline in persistence casts doubt on the industry rule of thumb to invest only in funds that were previously in the top quartile. Except for the bottom quartile, previous quartile performance is not a strong predictor of current fund quartile performance for buyout funds.

Third, the lack of a performance-size relation suggests that buyout funds have been able to scale their performance as they have become larger. PME's in the post-2000 period are not appreciably different from those in the earlier period despite much larger fund sizes.

The results for VC funds are markedly different. We find that performance remains statistically and economically persistent throughout the sample period. Partnerships whose previous VC funds are below the median for their vintage year subsequently tend to be below median and have returns below those of the public markets (S&P 500). Partnerships in the top two VC quartiles tend to stay above the median and their returns exceed those of the public markets. We also fail to find a negative relation between performance and fund size. These results imply much greater stability in the venture capital industry over time. Many of the same forces that operated in the 1980s and 1990s appear to still be in effect.

Our results on VC funds have two implications. First, the persistence of persistence in VC suggests that the industry rule of thumb to invest with GPs that have previously performed well and to avoid those that have not remains consistent with our results. The stronger performance persistence for VC as compared to buyout suggests that GP skills and networks for successful VC investing are harder to replicate than is true in buyout. At the same time however, VC funds with previous performance in both the top and second quartiles outperform the S&P 500. This is not consistent with the view that only very few VC funds outperform. In fact, previous funds that are above median appear to do so.

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Table 1: Summary Information on Funds

This table provides summary information on the sample of funds and their average performance. All data is provided by Burgiss. Buyout funds (VC funds) are summarized in Panel A (Panel B): the sample includes 607 (852) funds, and for 285 (436) of these funds there is a prior fund that can be used to measure performance persistence. Funds are classified by their vintage year, which is defined as the date when the fund first draws down capital from its investors. The % unrealized column measures the ratio of the remaining net asset value (NAV) reported by the fund, to the sum of the cash returned to investors plus the NAV. The cash flows and NAVs are updated as at December 31, 2011. For each vintage year three performance measures are provided. The average Internal Rate of Return (IRR); the Multiple of Invested Capital (MOIC), and the Public Market Equivalent (PME) return. The MOIC is defined as the ratio of (a) the cash returned to investors plus the remaining NAV, to (b) the cash invested by investors. The PME is computed in the same way as Kaplan and Schoar (2005), using the S&P 500 as the market index.

Panel A : Buyout Funds										
Vintage	Total	Ave. Capital Committed (\$m)	% Unrealized	Average IRR	Average MOIC	Average PME	Funds with Performance History	Average IRR	Average MOIC	Average PME
1984	1						0			
1986	6	407	0.0%	11.9%	2.15	0.93	0			
1987	8	282	0.0%	17.8%	2.87	1.32	2	18.5%	3.42	1.55
1988	6	427	0.1%	14.3%	2.06	0.98	1			
1989	11	445	3.8%	16.8%	2.33	1.12	2	8.2%	1.69	0.71
1990	3	237	0.4%	25.6%	2.53	1.30	0			
1991	3	1,170	0.2%	29.1%	2.51	1.32	2	30.7%	2.57	1.33
1992	9	233	0.2%	22.9%	2.46	1.19	2	19.1%	1.57	1.03
1993	9	314	0.1%	30.8%	2.79	1.41	2	14.9%	2.08	0.99
1994	17	470	0.1%	26.9%	2.35	1.34	5	30.0%	2.67	1.49
1995	20	705	0.8%	19.7%	1.96	1.27	7	21.5%	2.00	1.28
1996	15	440	5.3%	4.2%	1.29	1.00	8	2.4%	1.19	0.89
1997	34	753	4.1%	6.2%	1.30	1.13	20	10.3%	1.48	1.28
1998	38	1,030	6.9%	9.6%	1.57	1.48	20	6.9%	1.47	1.36
1999	30	927	8.6%	4.6%	1.32	1.20	12	1.0%	1.18	1.06
2000	46	1,190	19.4%	13.2%	1.69	1.46	23	14.7%	1.74	1.49
2001	26	1,210	29.5%	16.9%	1.65	1.39	15	16.6%	1.66	1.39
2002	20	715	32.9%	17.9%	1.81	1.50	9	14.6%	1.74	1.41
2003	15	1,300	36.5%	18.2%	1.94	1.68	7	17.4%	1.70	1.49
2004	43	822	51.2%	14.3%	1.60	1.46	19	11.8%	1.50	1.38
2005	56	1,100	66.6%	8.2%	1.36	1.28	32	9.0%	1.37	1.29
2006	66	1,740	73.7%	5.7%	1.20	1.14	33	3.0%	1.10	1.05
2007	67	1,990	81.5%	9.1%	1.23	1.12	30	10.8%	1.24	1.14
2008	58	1,540	83.5%	11.6%	1.22	1.07	34	11.9%	1.23	1.08
<i>Overall Sample</i>	<i>607</i>	<i>1,150</i>	<i>40.8%</i>	<i>11.9%</i>	<i>1.56</i>	<i>1.26</i>	<i>285</i>	<i>10.7%</i>	<i>1.46</i>	<i>1.24</i>

Panel B : Venture Capital Funds										
Vintage	Total	Capital Committed (\$m)	% Unrealized	Average IRR	Average MOIC	Average PME	Funds with Performance History	Average IRR	Average MOIC	Average PME
1984	18	67	0.0%	2.1%	1.60	0.63	0			
1985	19	45	0.0%	5.8%	2.00	0.73	0			
1986	12	44	0.9%	11.6%	2.30	0.97	1			
1987	18	84	0.0%	15.9%	2.68	1.17	5	17.1%	2.91	1.30
1988	18	80	0.2%	17.9%	2.40	1.17	6	19.1%	2.74	1.24
1989	22	60	0.2%	19.1%	2.83	1.28	12	23.3%	3.10	1.52
1990	13	75	0.0%	26.9%	3.05	1.55	4	37.7%	4.08	2.11
1991	8	221	4.3%	27.6%	2.78	1.34	4	19.2%	2.24	1.04
1992	18	110	0.4%	19.9%	2.60	1.22	12	23.1%	2.49	1.16
1993	21	117	0.0%	38.9%	4.83	2.13	10	52.3%	7.82	3.21
1994	21	115	0.5%	39.4%	5.17	2.35	12	51.1%	7.06	3.16
1995	27	115	0.9%	54.9%	5.21	2.98	12	47.3%	3.53	2.09
1996	21	141	2.0%	67.7%	5.92	3.78	14	90.3%	7.90	4.98
1997	37	163	3.1%	61.7%	2.88	2.32	17	101.8%	4.21	3.37
1998	50	191	9.5%	14.6%	1.52	1.40	34	19.3%	1.79	1.65
1999	78	322	18.0%	-2.8%	0.90	0.84	34	-2.5%	0.99	0.95
2000	97	427	35.6%	-2.7%	0.91	0.78	66	-2.3%	0.92	0.79
2001	50	387	46.9%	1.2%	1.13	0.92	29	2.4%	1.18	0.96
2002	17	318	48.3%	0.8%	1.08	0.87	9	0.5%	1.07	0.87
2003	27	246	59.1%	-0.3%	1.09	0.95	11	3.7%	1.31	1.15
2004	35	257	73.9%	1.0%	1.25	1.12	17	-0.4%	1.03	0.93
2005	51	337	78.0%	3.4%	1.36	1.25	36	4.5%	1.48	1.36
2006	64	395	84.1%	2.4%	1.14	1.05	31	4.2%	1.23	1.13
2007	65	345	88.1%	6.6%	1.23	1.12	35	6.8%	1.22	1.11
2008	45	340	87.9%	10.6%	1.27	1.08	25	16.4%	1.40	1.20
<i>Overall Sample</i>	<i>852</i>	<i>265</i>	<i>37.5%</i>	<i>12.5%</i>	<i>1.88</i>	<i>1.28</i>	<i>436</i>	<i>16.4%</i>	<i>2.10</i>	<i>1.47</i>

Table 2: Performance by Quartile

This table presents average performance by quartile. The sample is split into buyout funds (Panel A) and venture capital funds (Panel B). For each asset class, funds are assigned into quartiles separately for IRR, MOIC and PME, and the (un-weighted) average performance of the funds in each quartile is presented. Vintage years with less than 8 funds are excluded from the analysis. The sample is then further split according to whether the vintage year of the fund was up to (and including) 2000, or after 2000. See Table 1 for further information on the data sample.

Panel A: Buyout Funds				
	Average IRR	Average MOIC	Average PME	N
Whole sample				
Quartile 1	27.1%	2.29	1.82	154
Quartile 2	13.7%	1.58	1.32	144
Quartile 3	7.4%	1.29	1.09	151
Quartile 4	-3.0%	0.91	0.79	139
Pre-2001 Funds				
Quartile 1	31.2%	2.88	2.02	64
Quartile 2	14.6%	1.79	1.35	57
Quartile 3	6.7%	1.33	1.03	61
Quartile 4	-3.5%	0.87	0.69	55
Post-2000 Funds				
Quartile 1	24.2%	1.86	1.67	90
Quartile 2	13.1%	1.44	1.31	87
Quartile 3	7.9%	1.26	1.14	90
Quartile 4	-2.7%	0.93	0.85	84
Panel B: Venture Capital Funds				
	Average IRR	Average MOIC	Average PME	N
Whole sample				
Quartile 1	42.9%	3.90	2.56	225
Quartile 2	12.3%	1.64	1.16	208
Quartile 3	2.2%	1.14	0.81	216
Quartile 4	-10.1%	0.68	0.49	203
Pre-2001 Funds				
Quartile 1	58.8%	5.25	3.14	133
Quartile 2	17.1%	1.96	1.23	120
Quartile 3	4.4%	1.26	0.78	127
Quartile 4	-9.4%	0.66	0.40	118
Post-2000 Funds				
Quartile 1	20.0%	1.94	1.72	92
Quartile 2	5.8%	1.90	1.06	88
Quartile 3	-1.0%	0.95	0.84	89
Quartile 4	-11.0%	0.70	0.61	85

Table 3: Fund Persistence by Quartile Performance

This table shows the relationship between the performance, as measured by PME, of successive funds, according to their performance quartile. The sample is split according to buyout funds (Panel A) and venture capital funds (Panel B). Separately for each asset class and for each vintage year the funds are assigned to a quartile according to PME performance. Where the prior fund performance is available, the current fund quartile is matched to the previous fund quartile. Where the current fund was the first in the fund sequence for a given GP, the fund is assigned to the “First funds” category. In the remaining cases – where the previous fund performance is not available in our sample – the funds are allocated to the “NA, but not first fund” category. See Table 1 for further information on the data sample.

Panel A: Buyout Funds

							Average Current Fund IRR	Average Current Fund MOIC	Average Current Fund PME
		1	Current Fund Quartile			N			
			2	3	4				
Whole Sample									
Previous Fund Quartile	1	27.5%	27.5%	26.4%	18.7%	91	13.2%	1.59	1.34
		25	25	24	17				
	2	26.3%	22.4%	31.6%	19.7%	76	10.3%	1.42	1.23
		20	17	24	15				
	3	17.9%	26.9%	35.8%	19.4%	67	10.2%	1.44	1.21
	12	18	24	13					
	4	19.6%	19.6%	31.4%	29.4%	51	7.8%	1.28	1.10
		10	10	16	15				
NA, but not first fund		28.9%	26.1%	22.8%	22.2%	180	13.5%	1.67	1.29
		52	47	41	40				
First funds		29.6%	21.8%	19.7%	28.9%	142	12.0%	1.61	1.27
		42	31	28	41				
Pre-2001 Funds									
Previous Fund Quartile	1	37.5%	25.0%	18.8%	18.8%	32	17.3%	1.97	1.48
		12	8	6	6				
	2	30.4%	21.7%	30.4%	17.4%	23	7.2%	1.51	1.22
		7	5	7	4				
	3	21.4%	25.0%	32.1%	21.4%	28	11.0%	1.63	1.23
	6	7	9	6					
	4	17.4%	26.1%	30.4%	26.1%	23	8.2%	1.38	1.12
		4	6	7	6				
NA, but not first fund		30.2%	25.6%	25.6%	18.6%	86	16.4%	1.99	1.33
		26	22	22	16				
First funds		25.0%	20.3%	25.0%	29.7%	64	11.8%	1.77	1.21
		16	13	16	19				
Post-2000 Funds									
Previous Fund Quartile	1	22.0%	28.8%	30.5%	18.6%	59	11.0%	1.39	1.26
		13	17	18	11				
	2	24.5%	22.6%	32.1%	20.8%	53	11.6%	1.39	1.24
		13	12	17	11				
	3	15.4%	28.2%	38.5%	17.9%	39	9.6%	1.31	1.19
	6	11	15	7					
	4	21.4%	14.3%	32.1%	32.1%	28	7.4%	1.20	1.09
		6	4	9	9				
NA, but not first fund		27.7%	26.6%	20.2%	25.5%	94	10.9%	1.39	1.26
		26	25	19	24				
First funds		33.3%	23.1%	15.4%	28.2%	78	12.1%	1.48	1.31
		26	18	12	22				

Table 3: Fund Persistence by Quartile Performance (continued)

Panel B: Venture Capital Funds

		Current Fund Quartile					Average Current Fund	Average Current Fund	Average Current Fund
		1	2	3	4	N	IRR	MOIC	PME
Whole Sample									
Previous Fund Quartile	1	48.5%	16.7%	24.2%	10.6%		33.1%	3.28	2.26
		64	22	32	14	132			
	2	28.9%	34.2%	20.2%	16.7%		14.6%	1.84	1.30
		33	39	23	19	114			
	3	22.0%	29.4%	29.4%	19.3%		10.4%	1.74	1.19
		24	32	32	21	109			
	4	14.8%	17.3%	29.6%	38.3%		-0.3%	1.00	0.79
		12	14	24	31	81			
NA, but not first fund		22.0%	21.2%	27.3%	29.5%		7.6%	1.53	0.98
		52	62	72	74	260			
First funds		23.6%	22.1%	24.4%	29.9%		9.7%	1.86	1.26
		40	39	33	44	156			
Pre-2001 Funds									
Previous Fund Quartile	1	48.7%	14.1%	23.1%	14.1%		47.7%	4.41	2.79
		38	11	18	11	78			
	2	33.3%	27.0%	27.0%	12.7%		22.0%	2.35	1.48
		21	17	17	8	63			
	3	26.8%	35.7%	17.9%	19.6%		18.2%	2.33	1.40
		15	20	10	11	56			
	4	8.7%	19.6%	26.1%	45.7%		-0.3%	1.00	0.71
		4	9	12	21	46			
NA, but not first fund		19.9%	21.9%	30.1%	28.1%		10.9%	1.78	1.00
		30	43	50	44	167			
First funds		24.3%	23.0%	24.3%	28.4%		16.0%	2.36	1.40
		25	20	20	23	88			
Post-2000 Funds									
Previous Fund Quartile	1	48.1%	20.4%	25.9%	5.6%		12.1%	1.65	1.49
		26	11	14	3	54			
	2	23.5%	43.1%	11.8%	21.6%		5.5%	1.21	1.07
		12	22	6	11	51			
	3	17.0%	22.6%	41.5%	18.9%		2.2%	1.11	0.96
		9	12	22	10	53			
	4	22.9%	14.3%	34.3%	28.6%		-0.3%	1.01	0.90
		8	5	12	10	35			
NA, but not first fund		25.9%	19.8%	22.2%	32.1%		1.9%	1.08	0.94
		22	19	22	30	93			
First funds		22.6%	20.8%	24.5%	32.1%		1.6%	1.21	1.08
		15	19	13	21	68			

Table 4: Fund Persistence by Quartile Performance using IRR and MOIC

This table shows the relationship between the performance of successive funds, according to their performance quartile. The sample is split according to buyout funds (Panel A) and venture capital funds (Panel B). Separately for each asset class and for each vintage year the funds are assigned to a quartile according to performance measured by IRR and MOIC performance. Only funds for which the prior fund performance is available are included. For each period and performance measure the current fund quartile is matched to the previous fund quartile. See Table 1 for further information on the data sample.

Panel A: Buyout Funds

		Performance measured by IRR					Performance measured by MOIC				
		Current fund quartile					Current fund quartile				
		1	2	3	4	N	1	2	3	4	N
Whole Sample											
Previous Fund Quartile	1	25.8	29.2	30.3	14.6	89	23.3	26.7	33.3	16.7	90
	2	17.3	30.7	25.3	26.7	75	28.8	26.3	22.5	22.5	80
	3	22.9	22.9	32.9	21.4	70	19.1	31.8	23.8	25.4	63
	4	19.6	27.5	25.5	27.5	51	15.4	26.9	28.9	28.9	52
Pre-2001 Funds											
Previous Fund Quartile	1	38.7	22.6	25.8	12.9	31	30.3	24.2	30.3	15.2	33
	2	20.0	32.0	16.0	32.0	25	42.3	26.9	3.9	26.9	26
	3	19.2	23.1	26.9	30.8	26	8.7	43.5	21.7	26.1	23
	4	25.0	16.7	33.3	25.0	24	12.5	25.0	33.3	29.2	24
Post-2000 Funds											
Previous Fund Quartile	1	19.0	32.8	32.8	15.5	58	19.3	28.1	35.1	17.5	57
	2	16.0	30.0	30.0	24.0	50	22.2	25.9	31.5	20.4	54
	3	25.0	22.7	36.4	15.9	44	25.0	25.0	25.0	25.0	40
	4	14.8	37.0	18.5	29.6	27	17.9	28.6	25.0	28.6	28

Panel B: Venture Capital Funds

		Performance measured by IRR					Performance measured by MOIC				
		Current fund quartile					Current fund quartile				
		1	2	3	4	N	1	2	3	4	N
Whole Sample											
Previous Fund Quartile	1	46.6	16.5	28.6	8.3	133	49.2	17.7	24.6	8.5	130
	2	27.4	36.3	17.7	18.6	113	24.8	35.0	23.1	17.1	117
	3	25.9	28.6	27.7	17.9	112	26.6	26.6	26.6	20.2	109
	4	9.0	20.5	34.6	35.9	78	11.3	25.0	27.5	36.3	80
Pre-2001 Funds											
Previous Fund Quartile	1	47.4	11.5	29.5	11.5	78	49.4	15.6	22.1	13.0	77
	2	34.4	34.4	18.0	13.1	61	29.7	32.8	28.1	9.4	64
	3	26.7	30.0	26.7	16.7	60	29.1	25.5	23.6	21.8	55
	4	6.8	25.0	29.6	38.6	44	10.6	27.7	21.3	40.4	47
Post-2000 Funds											
Previous Fund Quartile	1	45.5	23.6	27.3	3.6	55	49.1	20.8	28.3	1.9	53
	2	19.2	38.5	17.3	25.0	52	18.9	37.7	17.0	26.4	53
	3	25.0	26.9	28.9	19.2	52	24.1	27.8	29.6	18.5	54
	4	11.8	14.7	41.2	32.4	34	12.1	21.2	36.4	30.3	33

Table 5: Fund Persistence by Quartile Performance using Preqin Data

This table uses data from Preqin. As cash-flow information is not available for calculating PMEs, only IRR and MOIC are reported. The table shows the relationship between the performance of successive funds, according to their performance quartile. The sample is split according to buyout funds (Panel A) and venture capital funds (Panel B). Separately for each asset class and for each vintage year the funds are assigned to a quartile according to performance measured by IRR and MOIC performance. Only funds for which the prior fund performance is available are included. For each period and performance measure the current fund quartile is matched to the previous fund quartile.

Panel A: Buyout Funds

		Performance measured by IRR					Performance measured by MOIC				
		Current fund quartile					Current fund quartile				
		1	2	3	4	N	1	2	3	4	N
Whole Sample											
Previous Fund Quartile	1	35.3	23.3	28.5	12.9	116	37.0	26.0	25.2	11.8	127
	2	20.4	27.4	31.0	21.2	113	28.2	26.2	23.3	22.3	103
	3	18.6	23.5	32.4	25.5	102	17.0	22.0	35.0	26.0	100
	4	18.8	21.7	23.2	36.2	69	20.0	20.0	27.1	32.9	70
Pre-2001 Funds											
Previous Fund Quartile	1	43.1	21.6	25.5	9.8	51	44.4	27.8	18.5	9.3	54
	2	21.7	26.1	32.6	19.6	46	32.5	22.5	27.5	17.5	40
	3	15.0	20.0	37.5	27.5	40	11.6	20.9	39.5	27.9	43
	4	12.5	31.3	31.3	25.0	32	9.4	21.9	43.8	25.0	32
Post-2000 Funds											
Previous Fund Quartile	1	29.2	24.6	30.8	15.4	65	31.5	24.7	30.1	13.7	73
	2	19.4	28.4	29.9	22.4	67	25.4	28.6	20.6	25.4	63
	3	21.0	25.8	29.0	24.2	62	21.1	22.8	31.6	24.6	57
	4	24.3	13.5	16.2	46.0	37	29.0	18.4	13.2	39.5	38

Panel B: Venture Capital Funds

		Performance measured by IRR					Performance measured by MOIC				
		Current fund quartile					Current fund quartile				
		1	2	3	4	N	1	2	3	4	N
Whole Sample											
Previous Fund Quartile	1	39.5	30.9	16.7	13.0	162	41.6	28.3	16.8	13.3	173
	2	30.7	31.4	23.5	14.4	153	31.9	30.6	22.2	15.3	144
	3	27.1	28.6	25.6	18.8	133	29.2	25.4	26.9	18.5	130
	4	11.8	11.8	33.3	43.0	93	10.6	19.2	26.6	43.6	94
Pre-2001 Funds											
Previous Fund Quartile	1	37.5	32.3	17.7	12.5	96	41.0	28.0	19.0	12.0	100
	2	34.4	31.2	18.3	16.1	93	32.6	29.1	22.1	16.3	86
	3	27.0	24.3	25.7	23.0	74	31.1	21.6	28.4	18.9	74
	4	15.0	12.5	37.5	35.0	40	14.0	23.3	23.3	39.5	43
Post-2000 Funds											
Previous Fund Quartile	1	42.4	28.8	15.2	13.6	66	42.5	28.8	13.7	15.1	73
	2	25.0	31.7	31.7	11.7	60	31.0	32.8	22.4	13.8	58
	3	27.1	33.9	25.4	13.6	59	26.8	30.4	25.0	17.9	56
	4	9.4	11.3	30.2	49.1	53	7.8	15.7	29.4	47.1	51

Table 6: Fund Persistence by Quartile of 2nd Previous Fund

This table shows the relationship between the performance, as measured by PME, of the current fund and second previous funds of the same GP, according to their performance quartile. The sample is split according to buyout funds (Panel A) and venture capital funds (Panel B). Separately for each asset class and for each vintage year the funds are assigned to a quartile according to PME performance. Where the 2nd previous fund performance is available, the current fund quartile is matched to the 2nd previous fund quartile. See Table 1 for further information on the data sample.

Panel A: Buyout Funds

		Current Fund Quartile					Average Current Fund IRR	Average Current Fund MOIC	Average Current Fund PME
		1	2	3	4	N			
Whole Sample									
Previous Fund Quartile	1	28.8% 15	25.0% 13	26.9% 14	19.2% 10	52	13.9%	1.60	1.36
	2	20.0% 7	20.0% 7	25.7% 9	34.3% 12	35	6.7%	1.28	1.15
	3	28.6% 10	25.7% 9	37.1% 13	8.6% 3	35	14.3%	1.49	1.28
	4	29.4% 5	17.6% 3	29.4% 5	23.5% 4	17	9.6%	1.40	1.29
Pre-2001 Funds									
Previous Fund Quartile	1	46.7% 7	26.7% 4	20.0% 3	6.7% 1	15	25.0%	2.28	1.78
	2	18.2% 2	18.2% 2	27.3% 3	36.4% 4	11	7.3%	1.43	1.20
	3	50.0% 5	30.0% 3	10.0% 1	10.0% 1	10	16.2%	1.81	1.45
	4	25.0% 1	25.0% 1	25.0% 1	25.0% 1	4	6.8%	1.38	1.32
Post-2000 Funds									
Previous Fund Quartile	1	21.6% 8	24.3% 9	29.7% 11	24.3% 9	37	9.5%	1.32	1.19
	2	20.8% 5	20.8% 5	25.0% 6	33.3% 8	24	6.4%	1.22	1.12
	3	20.0% 5	24.0% 6	48.0% 12	8.0% 2	25	13.5%	1.36	1.22
	4	30.8% 4	15.4% 2	30.8% 4	23.1% 3	13	10.5%	1.41	1.29

Table 6: Fund Persistence by Quartile of 2nd Previous Fund (continued)

Panel B: Venture Capital Funds

		Current Fund Quartile					Average Current Fund IRR	Average Current Fund MOIC	Average Current Fund PME
		1	2	3	4	N			
Whole Sample									
Previous Fund Quartile	1	40.7%	26.7%	19.8%	12.8%	86	33.4%	3.30	2.25
		35	23	17	11				
	2	35.2%	23.9%	23.9%	16.9%	71	17.0%	2.62	1.73
		25	17	17	12				
	3	27.6%	34.5%	24.1%	13.8%	58	17.7%	1.87	1.44
		16	20	14	8				
4	16.2%	24.3%	35.1%	24.3%	37	2.4%	1.11	0.94	
	6	9	13	9					
Pre-2001 Funds									
Previous Fund Quartile	1	47.1%	23.5%	13.7%	15.7%	51	50.5%	4.63	2.98
		24	12	7	8				
	2	42.4%	21.2%	15.2%	21.2%	33	29.2%	3.90	2.16
		14	7	5	7				
	3	27.6%	31.0%	24.1%	17.2%	29	29.6%	2.46	1.74
		8	9	7	5				
4	30.0%	40.0%	20.0%	10.0%	10	9.6%	1.44	1.11	
	3	4	2	1					
Post-2000 Funds									
Previous Fund Quartile	1	31.4%	31.4%	28.6%	8.6%	35	8.4%	1.37	1.18
		11	11	10	3				
	2	28.9%	26.3%	31.6%	13.2%	38	6.4%	1.51	1.36
		11	10	12	5				
	3	27.6%	37.9%	24.1%	10.3%	29	5.9%	1.27	1.13
		8	11	7	3				
4	11.1%	18.5%	40.7%	29.6%	27	0.0%	0.99	0.88	
	3	5	11	8					

Table 7: Fund Persistence Regressions

This table shows regressions of current fund performance, as measured by PME, on previous fund performance. Some regressions include the current fund size and the change in the fund size. All variables are expressed in natural logarithms. Log Previous Fund PME if PME <(>) 1 includes the log of the previous fund PME if the prior fund returns were below (exceeded) public market returns (as measured by the S&P 500). Vintage year dummies are included for the current fund and the previous funds that are included in the regressions. Only funds for which a previous fund exists in our sample are included. See Table 1 for further information on the data sample.

Panel A: Whole sample

	Buyout Funds						VC Funds					
(Log) Previous Fund PME	0.273*** [0.053]			0.407*** [0.087]	0.271*** [0.053]	0.269*** [0.053]	0.338*** [0.044]			0.272*** [0.062]	0.339*** [0.044]	0.321*** [0.044]
(Log) Previous Fund PME if PME<1	0.357*** [0.104]						0.338*** [0.080]					
(Log) Previous Fund PME if PME>=1	0.208** [0.064]						0.338*** [0.068]					
2nd Previous Fund PME		0.053 [0.075]	-0.002 [0.082]					0.167*** [0.060]	0.063 [0.060]			
(Log) Change Fund Size				0.019 [0.057]						-0.057 [0.069]		
(Log) Fund Size						0.027 [0.021]						0.157*** [0.042]
Vintage Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	285	285	139	139	285	285	436	436	252	252	436	436
Adj. R-squared	0.20	0.20	0.01	0.25	0.19	0.20	0.32	0.32	0.38	0.44	0.32	0.34

Panel B: Pre-2001 funds

	Buyout Funds						VC Funds					
(Log) Previous Fund PME	0.293*** [0.094]			0.570*** [0.162]	0.286*** [0.096]	0.296*** [0.094]	0.365*** [0.063]			0.252** [0.097]	0.367*** [0.063]	0.340*** [0.062]
(Log) Previous Fund PME if PME<1	0.244 [0.179]						0.380*** [0.126]					
(Log) Previous Fund PME if PME>=1	0.338* [0.169]						0.355*** [0.092]					
2nd Previous Fund PME		0.131 [0.154]	-0.045 [0.157]					0.171 [0.109]	0.064 [0.109]			
(Log) Change Fund Size				-0.092 [0.154]						-0.110 [0.113]		
(Log) Fund Size						0.051 [0.051]						0.265*** [0.075]
Vintage Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	106	106	40	40	106	106	243	243	123	123	243	243
Adj. R-squared	0.14	0.13	0.00	0.27	0.14	0.14	0.34	0.34	0.41	0.46	0.34	0.38

Panel C: Post-2000 funds

	Buyout Funds						VC Funds					
(Log) Previous Fund PME	0.280*** [0.062]			0.320*** [0.107]	0.258*** [0.074]	0.271*** [0.062]	0.281*** [0.053]			0.319*** [0.073]	0.282*** [0.053]	0.270*** [0.053]
(Log) Previous Fund PME if PME<1	0.627*** [0.130]						0.295*** [0.077]					
(Log) Previous Fund PME if PME>=1	0.084 [0.089]						0.261*** [0.099]					
2nd Previous Fund PME		-0.017 [0.098]	-0.004 [0.098]					0.133** [0.058]	0.057 [0.054]			
(Log) Change Fund Size				0.074 [0.050]						-0.010 [0.063]		
(Log) Fund Size						0.025 [0.019]						0.061* [0.036]
Vintage Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
N	179	179	99	99	179	179	193	193	129	129	193	193
Adj. R-squared	0.20	0.24	0.00	0.14	0.21	0.21	0.17	0.16	0.01	0.16	0.16	0.18

Table 8: Relation of Current Fund Log PME to Past Fund PME Quartiles

This table shows regressions of current fund performance, as measured by PME, on previous fund quartile performance and status. Where the current fund was the first in the fund sequence for a given GP, the fund is assigned to the “First-Time Fund” category. In the remaining cases – where the previous fund performance is not available in our sample – the funds are allocated to the “No Previous Fund” category. Vintage year dummies are included for the current fund.

Previous Fund Performance	Panel A: Buyout Funds			Panel B: VC Funds		
	All Years	Pre-2001	Post-2000	All Years	Pre-2001	Post-2000
2nd Quartile	-0.048 [0.062]	-0.170 [0.136]	0.015 [0.059]	-0.275*** [0.085]	-0.312*** [0.134]	-0.218** [0.085]
3rd Quartile	-0.070 [0.065]	-0.180 [0.132]	-0.010 [0.065]	-0.317*** [0.087]	-0.311*** [0.133]	-0.299*** [0.085]
4th (Lowest) Quartile	-0.194*** [0.071]	-0.331** [0.140]	-0.110 [0.072]	-0.631*** [0.095]	-0.811*** [0.141]	-0.381*** [0.095]
No Previous Fund Info	-0.023 [0.052]	-0.095 [0.105]	0.008 [0.052]	-0.504*** [0.073]	-0.600*** [0.111]	-0.361*** [0.080]
First-Time Fund	-0.078 [0.054]	-0.209* [0.111]	-0.00 [0.054]	-0.421*** [0.080]	-0.502*** [0.126]	-0.311*** [0.080]
Year Dummies	Y	Y	Y	Y	Y	Y
N	607	256	351	852	498	354
R-squared	0.09	0.06	0.11	0.21	0.24	0.09

Table 9: Relation of Current Fund Log PME to Past Fund Log PME With GP Fixed Effects

This table shows regressions of current fund performance, as measured by PME, on previous fund performance. Some regressions include the current fund size. All variables are expressed in natural logarithms. Vintage year dummies are included for the current fund and the previous funds that are included in the regressions. Only funds for which a previous fund exists in our sample are included.

Panel A: Buyout Funds						
	All Years	All Years	Pre-2001	Pre-2001	Post-2000	Post-2000
Previous Fund Performance						
Previous Fund log PME	-0.045 [0.063]	-0.067 [0.065]	0.033 [0.081]	-0.044 [0.077]	-0.319*** [0.094]	-0.318*** [0.094]
(Log) Fund Size		-0.080** [0.061]		-0.283*** [0.096]		-0.00 [0.077]
Year Dummies	Y	Y	Y	Y	Y	Y
GP Fixed Effects	Y	Y	Y	Y	Y	Y
N	285	285	106	106	179	179
R-squared	0.06	0.04	0.10	0.04	0.02	0.02
Panel B: Venture Capital Funds						
	All Years	All Years	Pre-2001	Pre-2001	Post-2000	Post-2000
Previous Fund Performance						
Previous Fund log PME	-0.081* [0.049]	-0.089* [0.048]	-0.219*** [0.082]	-0.219*** [0.083]	-0.245* [0.141]	-0.232 [0.140]
Log Fund Size		-0.131 [0.109]		0.008 [0.127]		0.172 [0.118]
Year Dummies	Y	Y	Y	Y	Y	Y
GP Fixed Effects	Y	Y	Y	Y	Y	Y
N	436	436	243	243	193	193
R-squared	0.15	0.12	0.13	0.13	0.00	0.01

Appendix Table 1: Fund Persistence by PME of Previous Fund

This table shows the relationship between the performance of successive funds, by relating the PME level of the previous fund to the current fund performance quartile. The sample is split according to buyout funds (Panel A) and venture capital funds (Panel B). Separately for each asset class and for each vintage year the current funds are assigned to a quartile according to PME performance. Where the prior fund performance is available, the current fund quartile is matched to the previous fund PME level. Where the current fund was the first in the fund sequence for a given GP, the fund is assigned to the “First funds” category. In the remaining cases – where the previous fund performance is not available in our sample – the funds are allocated to the “NA, but not first fund” category. See Table 1 for further information.

Panel A: Buyout Funds

		Current Fund Quartile					Average Current Fund IRR	Average Current Fund MOIC	Average Current Fund PME
		1	2	3	4	N			
Whole Sample									
Previous Fund PME	> 1.50	30.1% 31	28.2% 29	25.2% 26	16.5% 17	103	13.7%	1.55	1.34
	1.50 > PME > 1.25	17.4% 12	27.5% 19	29.0% 20	26.1% 18		8.4%	1.35	1.22
	1.25 > PME > 1.00	26.1% 12	15.2% 7	45.7% 21	13.0% 6	46	11.0%	1.45	1.17
	< 1.0	17.9% 12	22.4% 15	31.3% 21	28.4% 19		8.5%	1.41	1.14
	NA, but not first fund		28.9% 52	26.1% 47	22.8% 41	22.2% 40	180	13.5%	1.67
First funds		29.6% 42	21.8% 31	19.7% 28	28.9% 41	12.0%		1.61	1.27
Pre-2001 Funds									
Previous Fund PME	> 1.50	37.5% 9	29.2% 7	12.5% 3	20.8% 5	24	18.5%	1.92	1.48
	1.50 > PME > 1.25	33.3% 6	27.8% 5	27.8% 5	11.1% 2		11.4%	1.69	1.45
	1.25 > PME > 1.00	31.6% 6	10.5% 2	36.8% 7	21.1% 4	19	8.7%	1.64	1.15
	< 1.0	17.8% 8	26.7% 12	31.1% 14	24.4% 11		9.0%	1.50	1.17
	NA, but not first fund		30.2% 26	25.6% 22	25.6% 22	18.6% 16	86	16.4%	1.99
First funds		25.0% 16	20.3% 13	25.0% 16	29.7% 19	11.8%		1.77	1.22
Post-2000 Funds									
Previous Fund PME	Lagged PME > 1.50	27.5% 22	28.8% 23	28.8% 23	15.0% 12	80	12.3%	1.44	1.30
	1.50 > PME > 1.25	11.8% 6	27.5% 14	29.4% 15	31.4% 16		7.3%	1.24	1.14
	1.25 > PME > 1.00	22.2% 6	18.5% 5	51.9% 14	7.4% 2	27	12.6%	1.32	1.19
	Lagged PME < 1.0	18.2% 4	13.6% 3	31.8% 7	36.4% 8		7.4%	1.23	1.09
	NA, but not first fund		27.7% 26	26.6% 25	20.2% 19	25.5% 24	94	10.9%	1.39
First funds		33.3% 26	23.1% 18	15.4% 12	28.2% 22	12.1%		1.48	1.31

Appendix Table 1: Fund Persistence by PME of Previous Fund (continued)

Panel B: Venture Capital Funds

		Current Fund Quartile PME					Average Current Fund IRR	Average Current Fund MOIC	Average Current Fund PME
		1	2	3	4	Total			
Current Funds									
Previous Fund PME	> 1.50	50.0%	17.6%	18.6%	13.7%		43.8%	3.72	2.54
		51	18	19	14	102			
	1.50 > PME > 1.25	42.1%	26.3%	21.1%	10.5%		20.5%	2.67	1.63
		16	10	8	4	38			
	1.25 > PME > 1.00	26.4%	22.2%	36.1%	15.3%		8.5%	1.61	1.23
		19	16	26	11	72			
	< 1.0	21.0%	28.1%	25.9%	25.0%		5.8%	1.41	1.02
		47	63	58	56	224			
NA, but not first fund		22.0%	21.2%	27.3%	29.5%		7.6%	1.53	0.98
		52	62	72	74	260			
First funds		23.6%	22.1%	24.4%	29.9%		9.7%	1.86	1.26
		40	39	33	44	156			
Pre-2001 Funds									
Previous Fund PME	> 1.50	45.8%	19.3%	19.3%	15.7%		49.9%	4.21	2.80
		38	16	16	13	83			
	1.50 > PME > 1.25	39.1%	21.7%	21.7%	17.4%		24.6%	3.32	1.71
		9	5	5	4	23			
	1.25 > PME > 1.00	21.4%	14.3%	42.9%	21.4%		10.6%	1.85	1.09
		6	4	12	6	28			
	< 1.0	22.9%	29.4%	22.0%	25.7%		10.1%	1.75	1.10
		25	32	24	28	109			
NA, but not first fund		19.9%	21.9%	30.1%	28.1%		10.9%	1.78	1.00
		30	43	50	44	167			
First funds		24.3%	23.0%	24.3%	28.4%		16.0%	2.36	1.40
		25	20	20	23	88			
Post-2000									
Previous Fund PME	> 1.50	68.4%	10.5%	15.8%	5.3%		16.8%	1.59	1.41
		13	2	3	1	19			
	1.50 > PME > 1.25	46.7%	33.3%	20.0%	0.0%		14.2%	1.67	1.50
		7	5	3	0	15			
	1.25 > PME > 1.00	29.5%	27.3%	31.8%	11.4%		7.2%	1.46	1.32
		13	12	14	5	44			
	< 1.0	19.1%	27.0%	29.6%	24.3%		1.8%	1.09	0.96
		22	31	34	28	115			
NA, but not first fund		25.9%	19.8%	22.2%	32.1%		1.9%	1.08	0.94
		22	19	22	30	93			
First funds		22.6%	20.8%	24.5%	32.1%		1.6%	1.21	1.08
		15	19	13	21	68			