Private Equity Insights

THIRTEENTH EDITION | Q3 2018

CURRENT QUARTER PERFORMANCE SUMMARY

The State Street Global Exchange® Private Equity Index (GXPEI) posted a moderate increase of 3.03% in the third quarter of 2018. The Venture Capital category held its lead for the third quarter in a row with a 4.65% gain, followed by Buyout Funds with 2.84%. Private Debt lagged with a 1.34% return over the quarter (down from 1.9% in Q2). (See Exhibit 1).

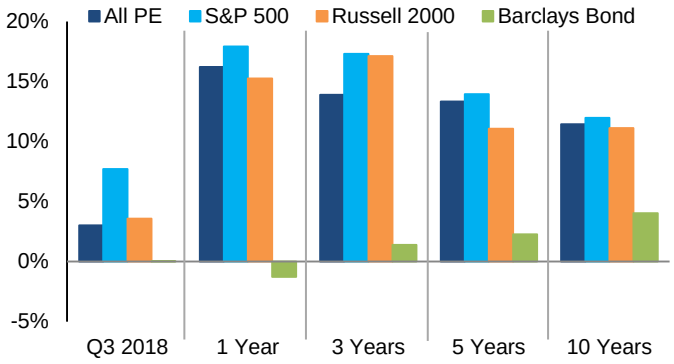
Exhibit 1. Private Equity Performance by Strategy

	All PE	Buyout	VC	Private Debt
2018 Q3	3.03%	2.84%	4.65%	1.34%
2018 Q2	3.99%	4.18%	4.64%	1.90%
2018 Q1	2.44%	2.09%	3.78%	2.46%
YTD	10.62%	10.26%	14.89%	5.45%

Source: State Street Global Exchange®, as of Q3 2018.

As shown in Exhibit 2, GXPEI outperformed the US debt market (proxied by the Barclays US Aggregate Bond Index) over all horizons but underperformed the US equity market (proxied by the S&P 500) over all horizons. Over one year and longer term horizons (5 years - 10 years) GXPEI outperformed small-cap stocks (proxied by Russell 2000).

Exhibit 2. Investment Horizon Returns



Source: State Street Global Exchange®, DataStream, Bloomberg Barclays US Aggregate Bond Index (total returns as of Q3 2018).

Continued on page 4.

THE PROMISE AND CHALLENGES OF IMPACT INVESTING

Insights from Harvard University and the Private Capital Research Institute

By Leslie Jeng and Josh Lerner

Investors—whether individual or institutional—are increasingly interested in using their capital to help make the world a better place. As asset owners allocate capital in support of solutions to critical social and environmental challenges, a highly diverse group of impact investing funds have been created over the last decade with billions of dollars put to work across various sectors, levels of risk, and expected returns. Investors are also pressing their traditional external managers to factor in the social implications of their investment decisions and demanding transparency on guidelines and relevant performance metrics.

But impact investing, the virtues of the various approaches—and even the difference that such transactions can make—are surrounded by a high level of confusion . Admittedly, one of the most critical questions centers on the tradeoff between selecting impact investments and maximizing returns. On September 11, 2018, a group of limited partners ("LPs"), academics, and general partners ("GPs") met at Harvard Business School under the aegis of the Private Capital Research Institute to share their perspectives on impact investing and its implications.

In this essay, we will highlight the recent academic research that was featured in the workshop. To begin the discussion, Shawn Cole of Harvard Business School presented his ongoing research (with coauthors Michael Chu, Vikram Gandhi, and Caitlin Brumme) on measuring and evaluating impact investing. Professor Cole explained that many studies use a broad definition for impact funds, and thus pool all funds that describe themselves as "impact investing" together. However, impact funds are a diverse asset class,

Continued on page 2.

with some prioritizing their social goals over financial returns while others primarily focus on returns. Given such heterogeneity, Cole described some qualitative frameworks to categorize the funds, taking into account the motivation, return expectation, and the strategies employed by these funds. For example, a fund that is looking for the most efficient way to achieve impact without prioritizing returns would be classified as an "impact-driven" fund. Meanwhile, some funds that do not explicitly say that they are an impact fund, but are mindful to integrate environmental and social goals, would be categorized as "co-incident" funds, and thus fall on the other end of impact-fund classification. Next, Cole elaborated on the challenges in evaluating the success of impact funds. One such challenge is that individuals value things differently, potentially making it difficult to determine what to measure. Yet, if funds are able to create their own niche targeting groups, this may not be such a big problem. Another challenge is properly measuring the effectiveness of a project. Here, pioneering approaches such as randomized control trials allow measuring the effectiveness of a project with very little bias, and frameworks such as cost-benefit analysis can be used to evaluate distinct sets of goals which may, at first, seem like an insurmountable task. Lastly, how funds choose to present and report the evaluation of their impact funds remains a challenge. Tracking 38 impact funds, Cole and his co-authors find that while roughly 40% of these funds explicitly report impact on their public website, only 13% have downloadable reports available to the public. In the second presentation, Anna Kovner of the Federal Reserve Bank of New York presented her research (conducted jointly with Josh Lerner) that examines investments made by community development venture capital funds ("CDVCs") designed to benefit both entrepreneurs and communities[1]. Kovner and her co-author used comprehensive venture capital financings by both traditional and CDVC venture funds from 1996 to 2009 to compare the effectiveness of CDVCs. The authors find substantial differences between CDVCs and traditional venture capital (VC) investments. First, they find that CDVCs are more likely to invest in earlier financing rounds and that firms backed by CDVCs have fewer venture investors participating in each round. This finding suggests that CDVCs are typically more involved in investments where financial constraints are greater. The industries that CDVCs invest in also differ: CDVCs are less likely to invest in biotech and communications/electronics transactions traditional venture firms have higher success rates. They also show that CDVC investments are far more likely to be in non-metropolitan regions and regions with little prior venture capital activity. While San Francisco, Boston, and New York comprise nearly 50% of all traditional VC investments, CDVC investments in these metropolitan areas were much lower at 25%. Given that CDVCs disproportionately invest in industries and regions associated with lower success rates, the authors use a comparable sample of traditional VC investments to compare returns. They find that CDVCs seem to substantially underperform: the companies they back are less likely to go public or to be acquired relative to comparable VC investments. Moreover, they find that CDVC investments have limited impact on a region's GDP and unemployment. However, defining success more broadly, the authors note that CDVC activity has other positive impact on the community. Not only do CDVCs invest in industries and regions that are less likely to receive traditional VC capital, they also help attract other VC firms and investments to underserved regions in subsequent years. In the final presentation, David Musto of the Wharton School at the University of Pennsylvania discussed his three research papers (conducted with his co-authors at the Wharton School). Musto highlighted that institutional investors have a strict fiduciary duty that typically forbids sacrificing monetary returns for other goals. Thus, in their first paper, Musto et al look to understand whether institutional investors alter their investing behavior when faced with lower pressure to maximize profits[2]. The researchers explore changes in investment strategies after the passage of a constituency statute that gives directors of corporations the discretion to balance the interests of all stakeholders, rather than solely focusing on maximizing shareholder value. The authors find that institutional investors did not change their investment strategies, nor did

[1] Kovner, A., & Lerner, J. (2015). Doing Well by Doing Good? Community Development Venture Capital. Journal of Economics & Management Strategy, 24(3), 643-663.

[2] Geczy, C., Jeffers, J. S., Musto, D. K., & Tucker, A. M. (2015). Institutional investing when shareholders are not supreme. Harvard Business Law Review, 5, 73.

they divest from firms incorporated in those states that had passed the law. If these institutions had perceived that their investments in states with the constituency statute were in conflict with their fiduciary duties, they would have decided to no longer invest in these companies. This finding supports the notion that legislation that expands management discretion to consider non-shareholder interests is not in conflict with investment strategies employed under strict fiduciary responsibility. In their second paper, the authors survey 53 global private equity impact funds to evaluate whether GPs sacrifice their portfolio companies' missions in exchange for financial returns[3]. The authors assess the financial performance of a subset of market-rate-seeking impact funds and find that these funds ultimately achieve their targeted returns, while also preserving their portfolio companies' missions. The researchers find that returns are nearly identical to the Russell Microcap market index returns.Lastly, in their third paper, Musto et al analyze how GP-LP contracts and GP-portfolio company contracts differ between impact and non-impact funds[4]. The researchers look at three different types of funds: non-impact funds, impact funds seeking market returns, and impact funds not seeking market returns. Analyzing the language used in the contracts, the authors find that the governance terminologies were very similar within each group. However, they find that other features of the contracts used by impact funds differ from traditional funds. For instance, impact funds use new terms that directly relate to impact, as well as adjusting provisions concerning governance and investor protection to help ensure compliance with the fund's impact goal. The discussion highlighted the relative youth of academic research in the impact investing space, which of course reflects the youth of the sector itself. Taken together, these pioneering works shed light on both the potential and challenges of impact investing. Through close dialogue between practitioners and academics in the years to come, it is our hope that we will arrive at more precise answers to many of these important questions.

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The Private Capital Research Institute is a not-for-profit 501(c)(3) corporation formed to further the understanding of private capital and its global economic impact through a commitment to the ongoing development of a comprehensive database of private capital fund and transaction-level activity supplied by industry participants. The PCRI, which grew out of a multi-year research initiative with the World Economic Forum, also sponsors policy forums.

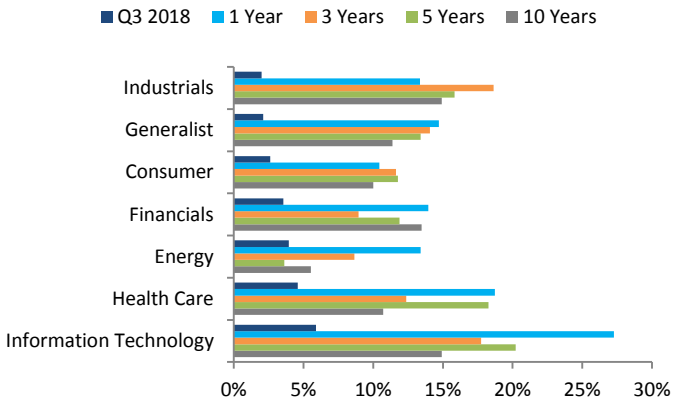
[3] Gray, J., Ashburn, N., Douglas, H., Jeffers, J., Musto, D., & Geczy, C. (2015). Great expectations: Mission preservation and financial performance in impact investing, Unpublished working paper, University of Pennsylvania.

[4] Geczy, C., Jeffers, J., Musto, D., & Tucker, A. (2018). Contracts with Benefits: The Implementation of Impact Investing. SSRN Electronic Journal, 2018.

CURRENT QUARTER PERFORMANCE SUMMARY – CONTINUED FROM PAGE 1

Among sectors, Information Technology funds led for the third straight quarter with a 5.91% quarterly return, down from 7.05% in Q2. These were followed by Health Care funds with a 4.59% quarterly return, up from 4.24% in the previous quarter, and Energy funds with a 3.94% quarterly return, down from 4.62% last quarter (Exhibit 3).

Exhibit 3. Returns of Sector Focused Private Equity Funds



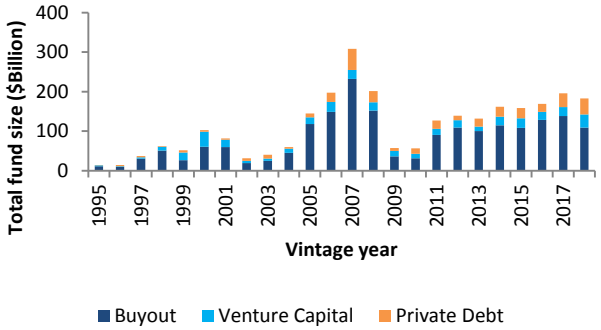
Source: State Street Global Exchange®, as of Q3 2018.

Fund Raising

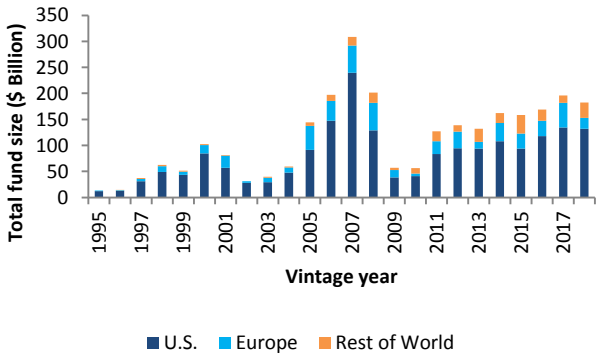
2018 is on course to set the highest post crisis fund raising records. In the first three quarters of this year, Venture Capital raised $34 billion and Private Debt raised $40 billion, already surpassing their fund raising activity in 2017 of $23 billion and $35 billion, respectively (see Exhibit 4 (A)). Across regions, the $132 billion from US funds is reaching 2017 levels of $134 billion. Funds from Rest of World have collected $29 billion which more than doubled since 2017. European funds are still lagging behind, with $20 billion raised, less than half of the amount raised in 2017 (see Exhibit 4 (B)).

As of Q3, the average fund size of Private Debt funds in 2018 vintage year is approaching $2.1 billion, the highest level post crisis. That reinforces the belief that fund managers and investors anticipate opportunities in Private Debt investments in the next market downturn, as we have seen prior to previous downturns in 2000, 2008 and 2015.

Exhibit 4. Total Fund Size (USD Billion)
(A) By Strategy

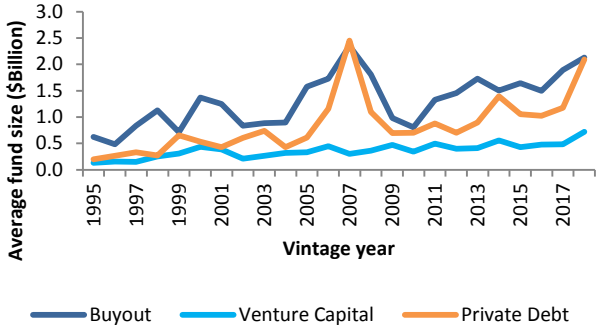


(B) By Region



Source: State Street Global Exchange®, as of Q3 2018.

Exhibit 5. Average Fund Size (USD Billion)



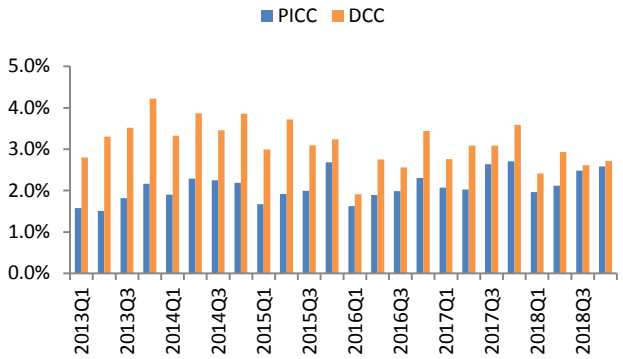
Source: State Street Global Exchange®, as of Q3 2018.

Cash Flow Activity

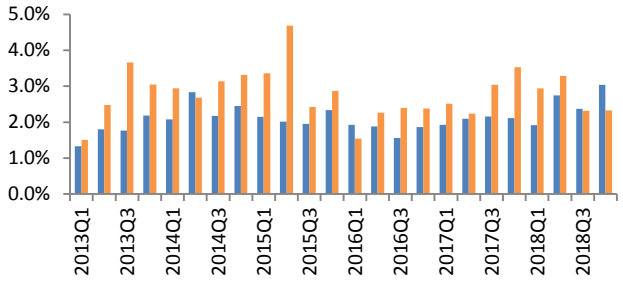
Compared to the high levels during 2013-2017, distributions became more conservative in 2018. The average Quarterly Distribution over Commited Capital (DCC) of 2018 is 2.7%. Quarterly Paid-in Capital over Commited Capital (PICC) is close to DCC, at roughly 2.3%. It appears that GPs continue to invest, particularly in VC and Private Debt funds.

Exhibit 6. Quarterly Cash Flow Ratios (2013Q1 – 2018Q4)

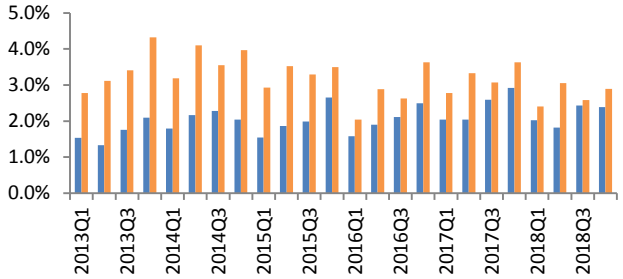
(A) All PE



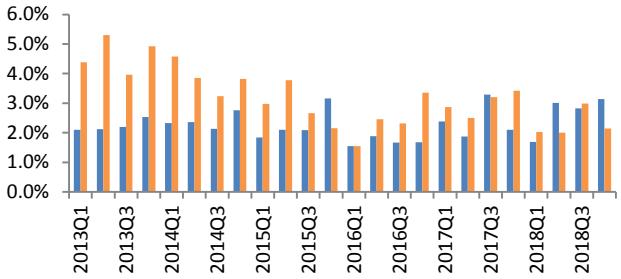
(B) VC



(C) Buyout



(D) Private Debt



Source: State Street Global Exchange®, as of Q4 2018.

Valuations

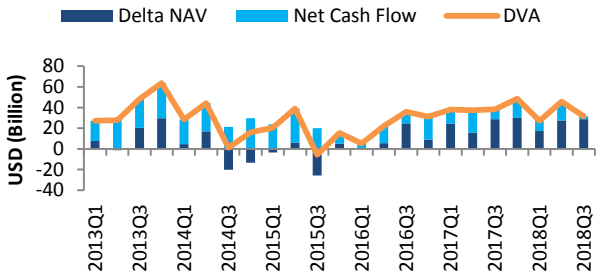
The Dollar Value Added (DVA) is the sum of NAV changes and net cash flows. It measures the realized and unrealized gain and loss in dollar amounts.

DVA = Ending NAV – Beginning NAV + Distribution - Contribution

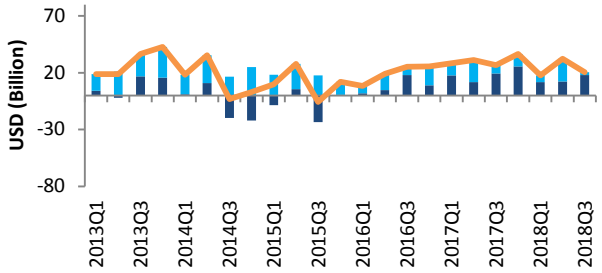
Almost completely contributed by NAV increases, the DVA of private equity decreased to $32 billion in Q3 2018 from $46 billion in Q2 2018. The cash component is only $3 billion, consistent with the observation in Exhibit 6 that net cash flow is small because amost all cash distributed were invested again. The DVA of the Buyout funds dropped to $20 billion in Q3 from $32 billion in Q2. Private Debt dropped to $1.6 billion in Q3 from $2.5 billion in Q2. Veture Capital kept a similar level around $10 billion.

Exhibit 7. Dollar Value Added (2013Q1 – 2018Q3)

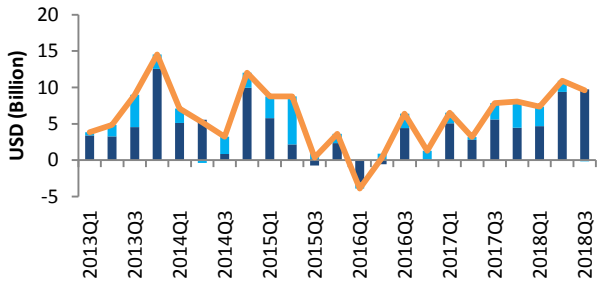
(A) All PE



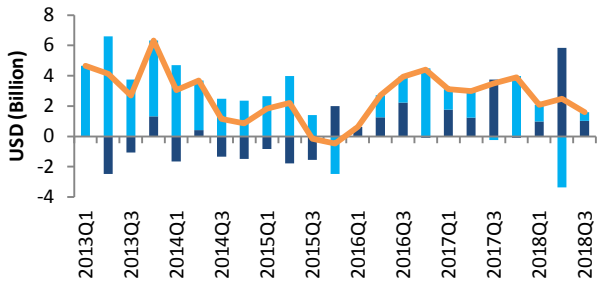
(B) Buyout



(C) Venture Capital



(D) Debt Related



Source: State Street Global Exchange®, as of Q3 2018.

DISCUSSION – THE SURVIVAL AND THE PERSISTENCE OF PRIVATE EQUITY GENERAL PARTNERS

One of our previous Private Equity Insights articles (2017Q1) featured Leslie Jeng and Josh Lerner's discussion of the persistence of private equity performance. They compared the quartile rank of the previous fund with the quartile rank of the subsequent fund using GXPEI data, and found evidence for a weaker performance persistence after 2000, particularly in Buyout funds. Similar results were found by Harris etc. using other data sources [5]. While these studies provide significant insights into performance persistence, they rely on ultimate fund performance. Such ranking of funds using ultimate fund performance is not feasible for LPs, as they can only rely on interim performance of prior funds that are still active when they make manager selection decisions [6]. Today's discussion is going to take another perspective - ranking GP's past performances during an in-sample period and testing the performance persistence of their subsequently raised funds in an out-of-sample period.

Imagine an investor evaluating GPs to invest in 2010 for the next 5 years by studying 2001-2008 vinage year funds. Our assumption is that the investor ignores 2009-2010 vintage year funds as they are too young and have insufficient performance track records. To avoid any lookahead biases, our in-sample data include 2001-2008 vintage year funds as of 2010, and the out-of-sample data include 2011-2015 vintage year funds. We seek to understand whether this investor may benefit from investing in top-quartile GPs based on past performance (i.e. point-in-time interim performance).

We first calculate the in-sample fund level PME (vs. MSCI All Country World Index) and excess PME by subtracting the median PME of the same vintage year funds. We then aggregate fund level excess PMEs to the GP and strategy level using fund size as weights, and assign quartile ranks to GPs within each strategy based on excess PME. We exclude small funds (defined as fund size less than $50 million) and any GPs with fewer than two funds in the in-sample period. Exhibit 8 shows the number of funds, GPs and their average PME and excess PME by strategy in-sample.

[5] Harris, Robert, Tim Jenkinson, Steven Kaplan, and Rüdiger Stucke, "Has Persistence Persisted in Private Equity? Evidence From Buyout and Venture Capital Funds, " Darden Business School Working Paper, August 2014

6 Barber, Brad M. and Yasuda, Ayako, Interim Fund Performance and Fundraising in Private Equity, Journal of Financial Economics (JFE), Vol. 124, No. 1, 2017.

Exhibit 8. In-Sample Data Statistics (2001-2008 VY)

Strategy	GP Count	Fund Count	Average PME	Avrage Excess PME
Buyout	131	331	1.093	0.082
Debt Related	43	101	1.058	0.065
Venture Capital	101	232	0.958	-0.055

Source: State Street Global Exchange®, as of Q3 2018.

To measure whether GP quartile ranking has any impact on performance during the out-of-sample period, we first calculate the excess PME of the those GPs' out-of-sample funds (inception to 2018 Q3 PME relative to its vintage year median) and then regress it on in-sample GP quartile ranking, fund strategy, and an interaction term between the two. As seen in Exhibit 9, higher in-sample GP rank results in better out-of-sample excess PME. On average, GPs with one notch higher in-sample quartile rank generate 0.076 higher out-of-sample excess PME for Venture Capital funds. However, little improvement can be gained for Buyout or Private Debt funds. This finding is consistent with studies by Jeng, Lerner and Harris etc., even though we use in-sample point-in-time GP performance to calculate quartile ranks, as well as more recent 2011-2015 vintage year funds.

Exhibit 9. Persistence: Out-of-sample Fund-level Excess PME Regressed on GP Quartile Ranking

Variable	Coefficient	P-Value
Intercept	0.313	0.000
Buyout	-0.241	0.010
Debt Related	-0.462	0.000
Quartile	-0.076	0.056
Quartile*Buyout	0.072	0.139
Quartile*Debt Related	0.098	0.152
# observation	244	
Adj R2	10.3%	

Source: State Street Global Exchange®, as of Q3 2018.

Another important question focuses on the impact of past GP performance on future fund raising. To address this question, we look into the relationship between GP's in-sample performance and their out-of-sample market share changes (i.e. the proportion of a GP's fund size of total raised capital). Not surprisingly, GPs with better in-sample performance tend to raise significantly more capital during the out-of-sample period (see Exhibit 10). Only the top quartile GPs were able to expand their market shares in the out-of-sample period, while all lower quartile groups lost market shares to the top quartile or new GPs[7].

Exhibit 10. Survival: GP Market Share of Capital Raised Comparison

Strategy	Quartile	MKT Share (in-sample)	MKT Share (out of sample)
Buyout	1	17%	19%
Buyout	2	35%	20%
Buyout	3	22%	11%
Buyout	4	13%	2%
Private Debt	1	23%	30%
Private Debt	2	29%	11%
Private Debt	3	23%	4%
Private Debt	4	11%	4%
Venture Capital	1	20%	32%
Venture Capital	2	21%	16%
Venture Capital	3	22%	4%
Venture Capital	4	13%	1%

Source: State Street Global Exchange®, as of Q3 2018.

The regression analysis in Exhibit 11 shows a significant positive correlation between GP's in-sample excess PME and GP's market share changes between in-sample and out-of-sample periods. To maintain the same market share out-of-sample, a GP needs to generate an in-sample excess PME of 0.028 (0.066 for Venture Capital, 0.001 for Buyout and 0.032 for Private Debt). Each percentage increase in GP's out-of-sample market share is associated with an increase of 0.048 in-sample excess PME, on average.

[7] Due to the limited scope of this article, we did not explore the performance and fund raising activity of these new GPs and the impact of concentration toward top quartile groups on performance persistence.

Exhibit 11: GP Excess PME (in-sample) Regressed on Market Share Change

	Model 1		Model 2	
Variable	**Coefficient**	**P-Value**	**Coefficient**	**P-Value**
Intercept	0.066	0.000	0.028	0.054
Buyout	-0.065	0.032		
Debt	-0.034	0.430		
Change in Market Share	4.848	0.000	4.279	0.000
# observation	275			
Adj R2	6.50%		5.60%	

Source: State Street Global Exchange®, as of Q3 2018.

ABOUT THE GX PRIVATE EQUITY INDEX

Participants in private capital markets need a reliable source of information for performance and analytics. Given the non-public nature of the private equity industry, collecting comprehensive and unbiased data for investment analysis can be difficult. The GX Private Equity Index ("GXPEI") helps address the critical need for accurate and representative insight into private equity performance.

Derived from actual cash flow data of our Limited Partner clients who make commitments to private equity funds, GXPEI is based on one of the most detailed and accurate private equity data sets in the industry today. These cash flows, received as part of our custodial and administrative service offerings, are aggregated to produce quarterly Index results. Because the GXPEI does not depend on voluntary reporting of information, it is less exposed to biases common among other industry indexes. The end result is an index that reflects reliable and consistent client data, and a product that provides analytical insight into an otherwise opaque asset class.

- Currently comprises more than 2,900 funds representing around $2.8 trillion in capital commitments as of Q3 2018.
- Global daily cash-flow data back to 1980.
- The Index has generated quarterly results since Q3 2004.
- Published approximately 100 days after quarter-end.

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