Private Equity Insights

TENTH EDITION | Q4 2017

CURRENT QUARTER PERFORMANCE SUMMARY

The State Street Global Exchange Private Equity Index (GXPEI) ended the fourth quarter of 2017 strong with a 4.78% total gain. Buyout funds led private equity strategies in gains with 5.23% for the quarter. Venture Capital returns improved to 4.21% from 3.57% in Q3 while Private Debt funds inched higher to 3.15% in returns, up from 2.84% in Q3 (see Exhibit 1).

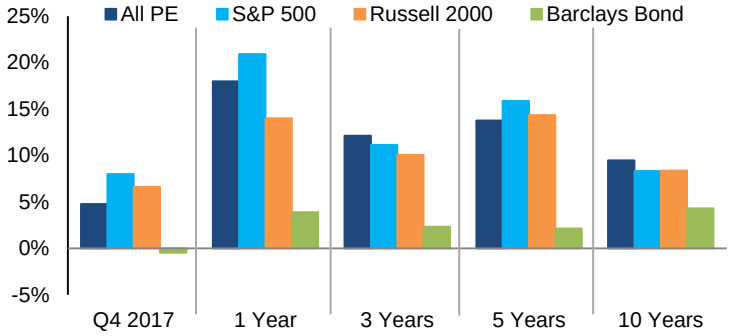
Exhibit 1: Private Equity Performance by Strategy

	All PE	Buyout	VC	Private Debt
2017 Q4	4.78%	5.23%	4.21%	3.15%
2017 Q3	3.85%	4.11%	3.57%	2.84%
2017	17.98%	19.75%	14.99%	13.05%
2016	10.36%	12.52%	2.84%	10.39%

Source: State Street Global Exchange℠, as of Q4 2017.

As shown in Exhibit 2, GXPEI outperformed the Barclays Bond Index over all horizons, and the S&P500 – a proxy for the US equity market – over the three- and ten-year horizons. Over shorter horizons (quarterly, one-year) and the five year horizon, the GXPEI underperformed the S&P500 (see Exhibit 2).

Exhibit 2: Investment Horizon Returns



Source: State State Global Exchange℠, DataStream, Bloomberg Barclays US Aggregate Bond Index (total returns as of Q4 2017).

Continued on page 4.

THE QUESTION OF LEVERAGE

Insights from Harvard University and the Private Capital Research Institute

By Leslie Jeng and Josh Lerner

One of the profound influences on the ultimate performance of private equity investments is the availability and utilization of leverage. Debt can be both a friend and foe of private equity returns.

On the one hand, debt plays an essential role in boosting private equity returns. First, though this has been weakened in last year's tax bill in the United States, debt has had a favorable tax treatment due to the deductibility of interest payments. Second, as Michael Jensen originally noted, debt can play a "disciplinary" role in transactions.[1] Typically, a buyout fund is attempting to accomplish some substantial transformation that will increase value during the early years of the transaction, whether through increased operational efficiency or the reconfiguration of the underlying business. A heavy debt load can underscore the point to management that such changes are not optional, but rather essential to the survival of the firm. Finally, by merely changing the capital structure to have more debt relative to equity, a private equity firm can even significantly enhance the equity returns of a deal that only has a relatively modest increase in overall firm value. (Of course, more leverage may increase the riskiness of the equity as well.)

On the other hand, the use of debt can sometimes go too far and lead to lower returns. A classic 2013 work by Ulf Axelson and his co-authors explores the consequences of

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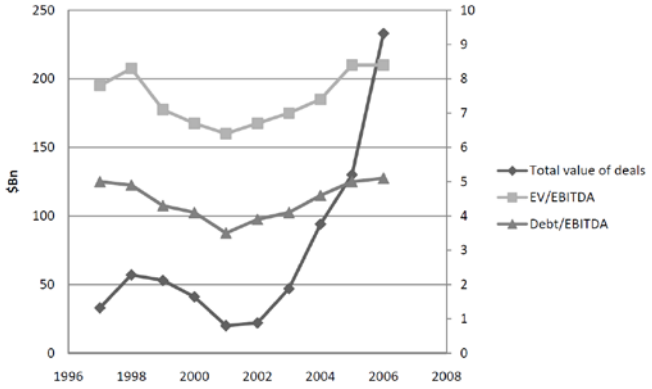
[1] Jensen, Michael C., "The eclipse of the public corporation," *Harvard Business Review*, 67, (1989):61-74.

debt across multiple market cycles and geographies.[2] They show that unlike in publicly traded firms, the use of leverage in buyouts has little to do with the underlying characteristics of the companies themselves. Rather, it seems almost entirely driven by changes in credit conditions in the broader economy. Periods of cheap and easily available credit are associated with high leverage, and, in turn, with higher transaction prices. Exhibit 3 shows how the pricing of transactions has historically moved almost in lockstep with the degree of debt in deals. Perhaps not surprising, these high-priced transactions lower subsequent returns. These findings suggest that private equity investors overleverage and overpay when access to credit is readily available.

Exhibit 3: Value of Deals and the components.

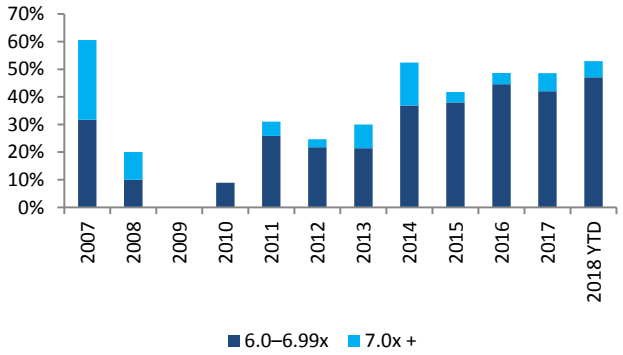


Source: Axelson, et al. (2013).

Apparently skeptical of the ability of buyout professionals and bankers to limit leverage themselves, policymakers have sought to limit the extent of leverage in buyouts. Both the European Central Bank (ECB) and U.S. regulators led by the Federal Reserve Bank have issued guidance to cap the amount of leverage used in private equity transactions, suggesting that leverage in excess of earnings before interest, taxes, depreciation and amortization (EBITDA) of six times is generally problematic. As the ECB noted when launching their regulations, "The prolonged period of very low interest rates and the ensuing search for yield strategies have warranted specific monitoring of credit quality by the ECB in general and of leveraged finance exposures in particular." [3]

When we look at the utilization of leverage today, we see both grounds for equanimity and concern. In Exhibit 4, we see that the volume of transactions where leverage exceeds seven times EBITDA, while greater than the trough of 2009-10, is many times less than the peak year of the last buyout boom, 2007. (Compared to the 90:10 and 95:5 debt-to-equity ratios seen in buyouts during the 1980s buyout boom, the contrast is even more dramatic.) While transactions leveraged six to seven times are commonplace, higher levels of leverage are not present.

Exhibit 4: US LBOs Levered at 6X or Higher.



Source: LCD, An offering of S&P Global Market Intelligence. Data through 2/28/2018.

Exhibit 5, however, raises some questions about the nature of these calculations. In particular, the figure documents that adjustments to the measures of EBITDA are far more common in today's market, having increased from about five percent of transactions in 2007 to one-quarter in 2017. Thus, it is natural to wonder whether the relative low cases of extreme leverage reflect an actual dampening of these cases relative to 2007, or rather gaming of profitability figures in order to ensure that the rations satisfy regulatory strictures.

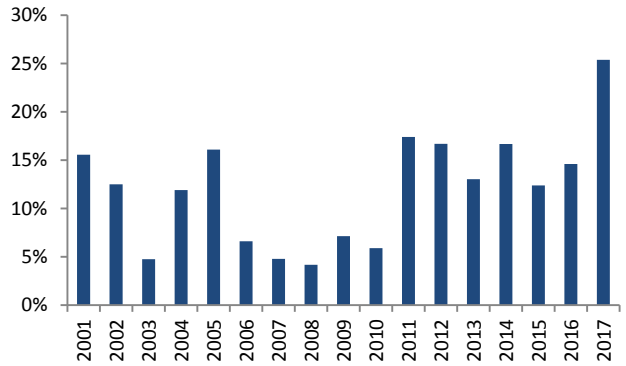
If we do accept the proposition that leverage has risen, akin to the patterns seen in earlier cycles, what are the implications for the industry? One possibility is that the industry has become better at managing leveraged investments during downturns. Only a few of the largest transactions failed during the mid-2000s, in stark contrast to

[2] Axelson, Ulf, Jenkinson, Tim, Strömberg, Per, and Weisbach, Michael, "Borrow cheap, buy high? The determinants of leverage and pricing in buyouts," *Journal of Finance*, 68, (2013):2223–67.

[3] European Central Bank, Banking Supervision, Guidance on leveraged transactions, May 2017, https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.leveraged_transactions_guidance_201705.en.pdf, page 2.

the meltdown of the late 1980s, when 13 of 35 largest deals done in 1986 and 1987 defaulted on debt payments.[4] Moreover, as we have shown in other work, private equity-backed firms after the 2008 Global Financial Crisis were more able to access bank loans and equity injections than their peers, which translated into more investment and ultimately greater market share.[5]

Exhibit 5: Percent of US Deals with EBITDA Adjustments.



Source: LCD, An offering of S&P Global Market Intelligence.

Another possibility was that the downturn after the crisis was unique in some respects. To cite one example, aggressive interventions by central banks world-wide kept interest rates extraordinary low, which helped ease the impact for many groups. Whether monetary authorities will be able or willing to intervene in the same way in the next downturn remains uncertain. Thus, important and difficult to answer questions surround the impact of leverage over the private equity industry going forward.

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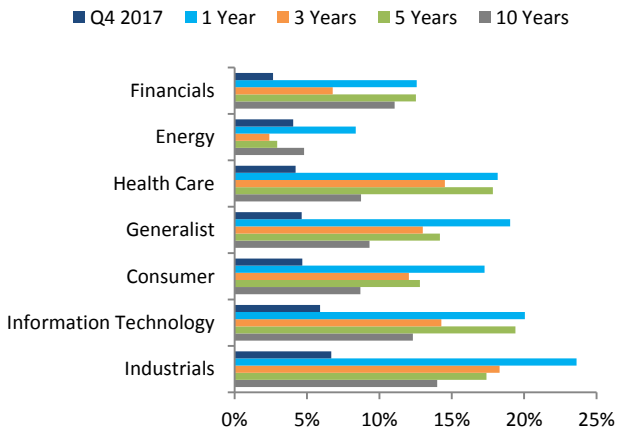
The Private Capital Research Institute is a not-for-profit 501(c)(3) corporation formed to further the understanding of private capital and its global economic impact through a commitment to the ongoing development of a comprehensive database of private capital fund and transaction-level activity supplied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

[4] Kaplan, Steven, and Stein, Jeremy, "The evolution of buyout pricing and financial structure in the 1980s", *Quarterly Journal of Economics*, 108, (1993):313–357.
[5] Bernstein, Shai, Lerner, Josh, and Mezzanotti, Filippo, "Private equity and financial fragility during the crisis," *Review of Financial Studies*, (2018) forthcoming.

CURRENT QUARTER PERFORMANCE SUMMARY – CONTINUED FROM PAGE 1

Among sectors, Industrial funds once again saw the highest return, rising to 6.68% from 5.87% in Q3, followed by Information Technology funds with a return of 5.91%, up from 3.80% in Q3; Energy funds' performance continued to improve with a return of 4.05%, up from 2.59% in Q3 (see Exhibit 6).

Exhibit 6: Return of Sector Focused Private Equity Funds



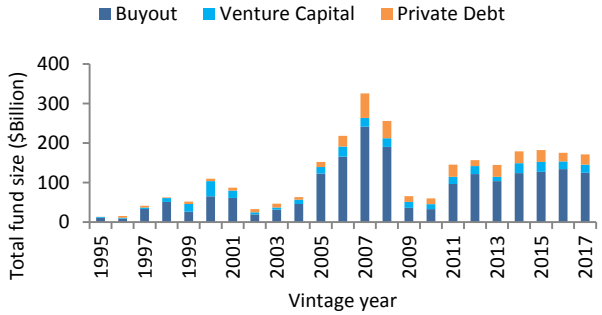
Source: State Street Global Exchange℠, as of Q4 2017.

Cash Flow Activity

Fund Raising Activity saw a slight decline from its peak in 2015. Total funds raised in 2017 were 171.32 billion USD, as shown in Exhibit 7.

We saw stronger cash flow activity from both the contribution and the distribution side in 2017 compared to 2016 (Exhibit 8). The net cash continues to flow back to investors illustrated by the distribution rate being higher than the contribution rate. In addition, the spread between distribution and contribution widened from 0.24% on average in 2016 to 0.3% on average in 2017. Across strategies, Private Debt is at the highest speed returning money to investors with 0.35% spread between contribution and distribution rate, while Buyout is the lowest speed (Exhibit 9). Both U.S. and Europe saw positive cash flows returning to investors. Interestingly, the spread is negative in the Rest of World, which indicates GPs may invest heavily outside of the U.S. and Europe, with the expectation potentially of higher returns in the future.

Exhibit 7: Total Fund Size (USD Billion)



Source: State Street Global Exchange℠, as of Q4 2017.

Exhibit 8: Monthly Average Cash Flow Ratios

Cash Flow Activity	2014	2015	2016	2017
Average Monthly PICC	0.74%	0.68%	0.64%	0.77%
Average Monthly DCC	1.21%	1.08%	0.88%	1.07%
Average Monthly Spread	0.47%	0.40%	0.24%	0.30%

Source: State Street Global Exchange℠, as of Q4 2017.

Exhibit 9: Monthly Average Cash Flow Ratios of 2017 by Region and Strategy

Region	PICC	DCC	Spread
All PE	0.77%	1.07%	0.30%
U.S.	0.69%	1.08%	0.39%
Europe	0.73%	1.15%	0.42%
Rest of World	1.23%	0.87%	-0.36%

Strategy	PICC	DCC	Spread
All PE	0.77%	1.07%	0.30%
Buyout	0.68%	0.94%	0.26%
Venture Capital	0.81%	1.10%	0.29%
Private Debt	0.67%	1.02%	0.35%

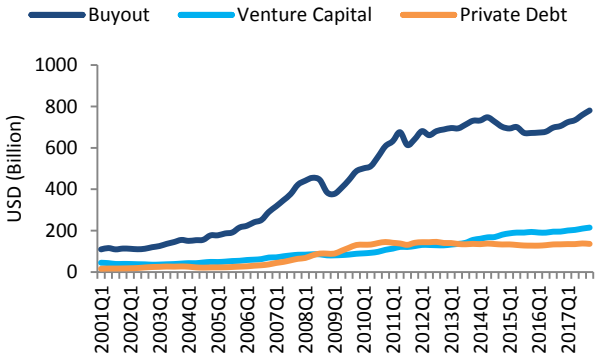
Source: State Street Global Exchange℠, as of Q4 2017.

Valuations

Despite the long term upward trend of net asset value (NAV) across the board, Buyout funds have seen an increase for the past two years after a downturn around 2014-2015. The net

asset value for Venture Capital funds has been increasing consistently for almost two decades. On the other hand, Private Debt remained at similar levels since as early as 2010 (see Exhibit 10).

Exhibit 10: Net Asset Value by Strategy (2001Q1 – 2017Q4)



Source: State Street Global Exchange[SM], as of Q4 2017.

Changes in NAV can be a result of valuation changes on remaining assets as well as contribution/distribution cash flows. The sum of NAV changes and net cash flows is referred as the Dollar value added (DVA), which measures the realized and unrealized gain and loss in dollar amounts.

DVA = Ending NAV – Beginning NAV + Distribution - Contribution

Exhibit 11: Dollar Value Added (2010Q1 – 2017Q4)
(a) All PE

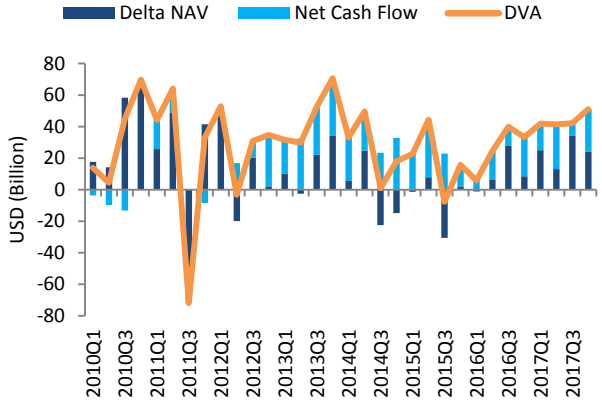
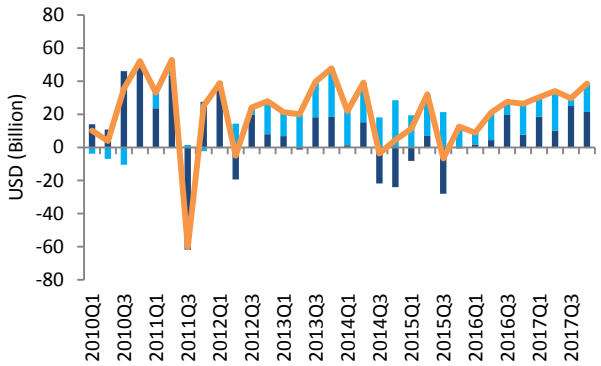
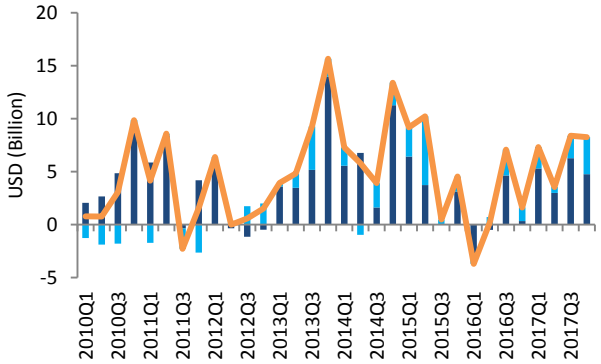


Exhibit 11 shows the quarterly DVA along with net cash flow (positive means money returns to LPs) and the quarterly NAV changes. In aggregate, all PE funds in our database added $280 billion ($177 billion in 2017 alone) after a dip around the second half of 2015. We saw the highest quarterly DVA of $51 billion in 2017Q4 since 2014Q2. The positive net cash flow was predominate in private debt funds in recent quarters, while venture capital funds saw much of their DVA in NAV increases rather than realized cash flow to LPs. NAV increase and net cash flow back to LPs were more balanced for Buyout funds in recent quarters.

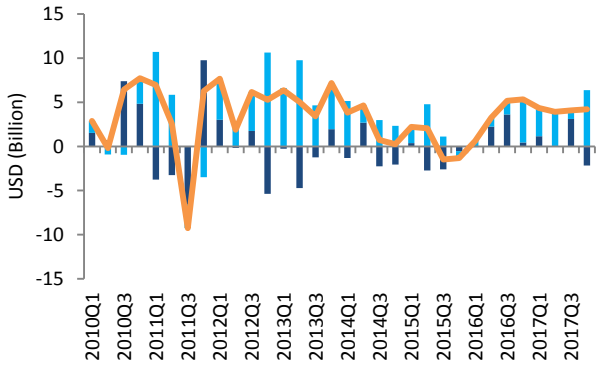
(b) Buyout



(c) Venture Capital



(d) Private Debt



Source: State Street Global Exchange[SM], as of Q4 2017.

DISCUSSION – CUSTOMIZED PORTFOLIO BENCHMARK

While the aggregated State Street Global Exchange Private Equity Index is a representative benchmark for the broad private capital market, it may not be perfectly aligned with the investment style and capital allocation of a specific PE program. Many investors look for solutions in customized benchmarks. There are three main stages of customization: 1. Select an investment opportunity set matching client's own portfolio; 2. Rescale the custom index to match the client portfolio weights; 3. Simulate a wide range of possible fund selection outcomes while maintaining the investment style, allocation, and program size (i.e. number of funds) as the client portfolio.

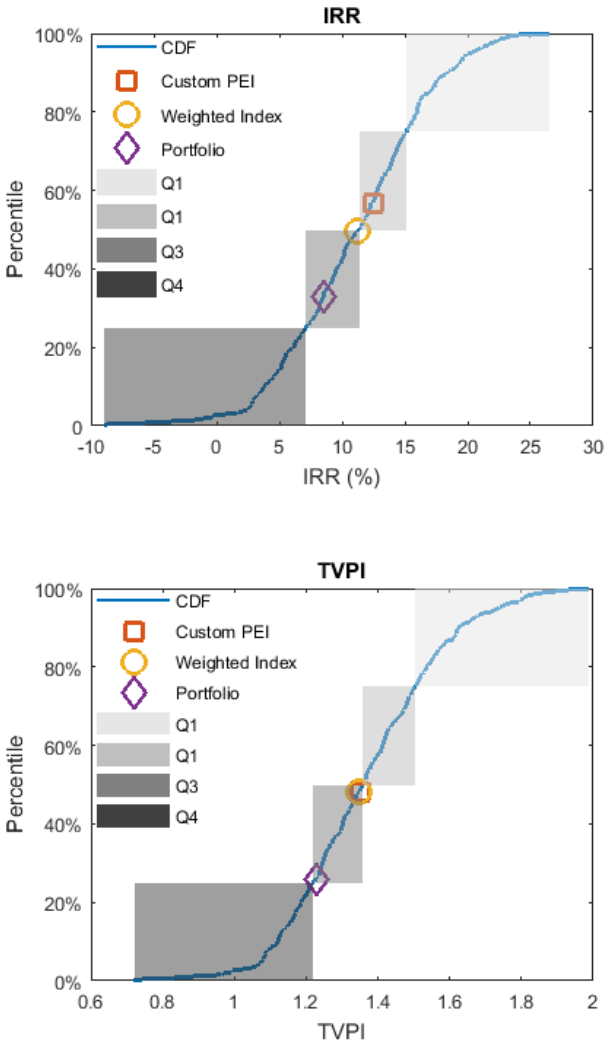
We use a hypothetical portfolio to illustrate the different stages of customization. This portfolio invests 40% commitment in three random 2010 Buyout funds and 60% in another three random 2013 Buyout funds (See Exhibit 12. Portfolio). We first create a custom index using all vintage year 2010 and 2013 Buyout funds in our GXPEI database (see Exhibit 12. Custom PEI). This custom index matches the investment style (Buyout) and vintage year choices (2010, 2013) of the portfolio, but it has very different commitment weights with about 25% in vintage year 2010 and 75% in 2013. It also includes many more funds, and therefore is more diversified than this portfolio.

In the second stage of customization, we construct the index by rescaling the cash flows of 2010 and 2013 Buyout funds so that the new customized index would have the same commitment weights in these two vintage years as the portfolio (see Exhibit 12. Weighted Index). This rescaling can be done across other dimensions of investment styles such as geo-focus, fund size, sub-strategy and sector focus etc.

PE investor often compares individual fund performance to performances of its peers. However, it becomes difficult to compare an individual PE program (i.e. a portfolio of funds) to its peers because almost all PE programs are different one way or another. Given the comprehensive GXPEI database, we are able to simulate a large set of peer portfolios by randomly selecting the same number of funds from the matching investment styles in the fund universe and rescaling to the same commitment allocation as this example portfolio. Exhibit 12 shows the cumulative distribution function of IRR and TVPI (see Exhibit 12. CDF) of those simulated peer portfolios for our hypothetical portfolio. Each of these simulated peer portfolios has three 2010 buyout funds and three 2013 buyout funds with rescaled cash flows to match the commitment weights of the hypothetical portfolio. It is particularly interesting to see the wide range of idiosyncratic performances. Our hypothetical portfolio falls into the third quartile of all simulated peer groups (see Exhibit 12. Q3).

In summary, by using stages of customization, we can decompose the performance difference between a portfolio and the broad GXPEI into investment style difference, portfolio weight difference and fund selection difference. Furthermore, using the peer portfolio simulation, we can estimate the idiosyncratic risk in fund selection for a particular client program.

Exhibit 12: Stages of Index Customization



Source: State Street Global Exchange℠, as of Q4 2017.

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 2,800 funds representing more than $2.7 trillion in capital commitments as of Q4 2017.
- 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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