MEKETA
INVESTMENT GROUP

Infrastructure

WHITEPAPER
APRIL 2020

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In this paper, we examine the benefits of including private infrastructure investments in institutional portfolios. We briefly describe the asset class, opportunities for institutional investors, and segmentation of the market. We focus on private markets for these assets because they offer greater portfolio diversification benefits, closer economic alignment between the manager and the investor, and higher likelihood of alpha than public market options. We use historical private market index data to examine infrastructure's attributes and return behavior, with a comparison to other asset classes generally. Our paper addresses implementation issues associated with infrastructure allocations. We conclude that the asset class' offerings are diverse and robust, performance has been good relative to various benchmarks, and many institutional portfolios have benefitted from including infrastructure among the asset classes.

Introduction

We consider infrastructure as one major category of Real Assets, defined generally as long-lived physical assets that are valued for their intrinsic physical qualities, unlike financial assets, such as stocks and bonds, which derive their value from claims on current and future cash flows. Real assets are the foundation of the production and delivery of goods and services critical to the global economy. Infrastructure assets have the following characteristics: long useful lives; high barriers to entry; monopolistic market positioning; and generally stable usage. Infrastructure investments also generally enjoy inelastic demand, relatively stable cash flows, and generally low long-term exposure to commodity prices. These attributes are usually attached to assets that have an "essentiality" component, including, for example, those associated with transportation, energy and other critical utilities, government operations, and mass communication networks. With this construct, Exhibit 1 below organizes infrastructure into categories and sub-sectors.

Infrastructure

Transportation	Energy/Utilities	Social	Communications
Toll Roads	Midstream	Hospitals	Cable Networks
Bridges	Transmission &	Medical Facilities	Towers
Tunnels	Distribution Systems	Education Facilities	Fiber
Airports	Storage Facilities	Police/Military Facilities	Spectrum
Seaports	Power Generation	Court Houses	Satellite Systems
Container Terminals	Renewable Power	Public Arenas	Wireless
Commercial Railroads	Water Conveyance &	Recreation	
Mass Transit	Distribution	Student Housing	
Parking Facilities	Water/Wastewater		
Logistics	Treatment		
	Waste Treatment		

EXHIBIT 1
Detail of Infrastructure Asset Categories and Sub-Sectors

Infrastructure assets can be an important component of long-term investment portfolios. Their addition to portfolios, dominated by publicly-traded stocks and bonds, can enhance diversification and, hence, improve risk adjusted returns, while providing current income, inflation protection, and capital appreciation. The infrastructure category encompasses an extremely wide variety of strategies, with respect to their level and type of risk, and their return potential and correlation.

Infrastructure investment universe

Investable private infrastructure opportunities for institutional investors, measured by capital raised for commingled funds, first became a meaningful part of the total private market landscape in 2005 and 2006. In these years, annual global infrastructure fundraising jumped from $10 billion to over $25 billion and thereafter averaged 7% of the total capital raised annually across all private asset classes[1] globally. After 2005, collectively, infrastructure fund vintages have averaged over $45 billion annually through the end of 2018, ranging from a low of $20 billion in 2009 to a record $97 billion in 2016, as shown in Exhibit 2 below. We note that, while it looks like 2017 and 2018 fall off from 2016, final close amounts actually continued to increase year-over-year, as some of the 2016 funds held final closes in 2017 and 2018. By the end of 2018, cumulative funds raised for infrastructure reached approximately $635 billion, on top of an estimated $180 billion of undeployed capital (i.e., "dry powder"). These data understate the investible universe because estimates are not readily available for other vehicles, including co-investments associated with commingled funds, separate accounts managed by many of the same general partners, and direct investments made by some of the world's largest pension plans and sovereign wealth funds.

[1] Private Equity, Private Debt, Real Estate, Infrastructure, and Natural Resources.

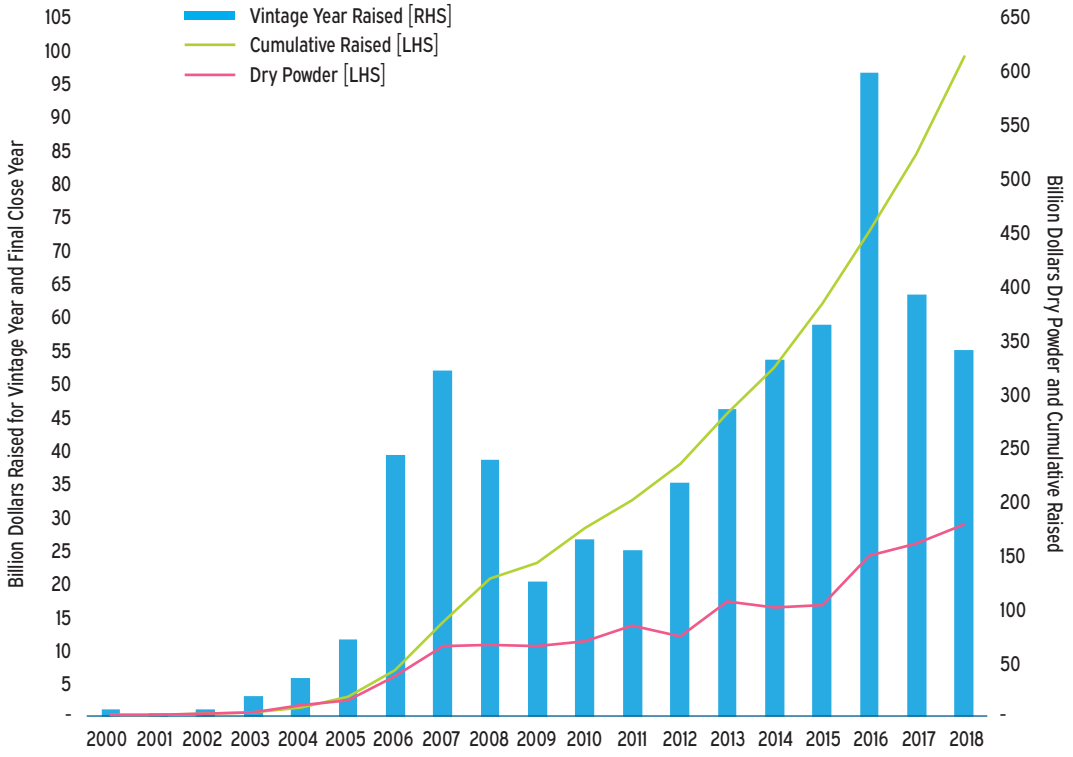


EXHIBIT 2
Infrastructure Funds Capital Raised Globally[2]

[2] Source: Preqin

The effect of the Global Financial Crisis (GFC) on fundraising is evident in Exhibit 2, where 2009 through 2011 have much lower capital raises than earlier or subsequent years. The trend of more capital moving into infrastructure investing is also visible, with 2012 onward showing increases.

The investible universe of private infrastructure funds can be segmented by three key attributes of their strategies, including: risk-return profile, which captures a number of important characteristics around return drivers and volatility; geography, which has distinct risk components, including currency and legal; and sector, which reflects different economic exposures and investment opportunities. Each of these dimensions of diversification is discussed below.

Risk-return profile

Investors can choose among infrastructure investment strategies that are broadly characterized as core, core plus, value add, opportunistic (that each make primarily equity investments), and debt. Each type is situated at a different point along the risk reward spectrum, and is often the first dimension established for diversification within an infrastructure program.

→ **Core** strategies buy assets that are essential to the economy and have a high certainty of revenue through long-term contracts, significant cash yield, and a strong link to inflation, often through a pass-through mechanism. They most

typically invest in "secondary stage" assets that are fully operational and require no investment for development.[3] Recently a new category has emerged—"super core"—as offered by a few managers thus far pursuing lower risk/lower return investments than core. The total return of core and super core assets is primarily attributable to current yield.

[3] Project stages Secondary, Brownfield, and Greenfield per Preqin's definitions.

- **Core plus** strategies exist between and often overlap core and value add. They may involve facility expansions without a complete retrofit or rehabilitation. They could also reflect a "build to core" strategy, where the assets would have a higher risk-return profile during a development, construction, and early operations stage, but ultimately qualify as a core asset for the long-term hold period. Thus, core plus strategies may have a steeper J-curve than core, and low yields early in the term, with the proportions of total return from yield and appreciation between core and value add.

- **Value add** strategies buy assets that have many of the same qualities as core assets, but offer the opportunity for additional value creation through further development, new or extended contracts, or increased capacity. These assets are typically "brownfield" situations involving an existing, operating asset needing improvements, repairs, or expansion. They may also involve renegotiating and extending contracts, and repurposing or improving existing assets. Most value add assets derive their return from a combination of yield and capital appreciation.

- **Opportunistic** strategies often involve new construction or development of an asset, which have more risk than buying an existing operational asset, but also offer the greatest potential return. These investments involve an elevated level of uncertainty, which may be related to revenue stability, future demand or usage, or significant exposure to commodity prices. Target deals may include brownfield assets that are more complicated or involve more capex than value add strategies, and/or "greenfield" assets that do not currently exist. The opportunistic category is also used by some investors to capture certain ex US strategies, including those in developing or frontier countries. Opportunistic returns in developed[4] markets are driven mostly by capital appreciation, while in other geographies they could have more of a yield component if executing an otherwise core strategy, for example.

[4] Most typically defined by Organization for Economic Cooperation and Development ("OECD") membership.

- **Debt** strategies provide project financing for a range of tenors in the non-equity portion of the capital stack, including senior debt, mezzanine, and convertible notes. Some strategies are designed to appeal as a substitute for fixed income, offering higher yields, while other strategies are marketed as a diversifier for infrastructure portfolios, with lower volatility and better downside protection than equity, but with returns like those of core strategies. Debt returns come primarily from current income. Investors also like that the asset-backed debt often comes with contracted revenues and strong counterparties, which sometimes offers further upside potential through warrants, options, convertible debt, and other instruments.

With respect to leverage, the profile across the risk-return spectrum differs from that of real estate, with which investors may be more familiar. For infrastructure, the amount of debt managers place on investments is typically directly related to the level and security of the revenue streams. As such, core strategies will usually have the highest leverage (e.g., 40% to 50% at the fund level, and up to 80% or 90% for individual investments with solid cash flows). At the opposite end of the risk spectrum, opportunistic strategies will typically use little to no debt, but may, for example, use construction loans that are drawn on, as needed, but not payable until completion. Value add strategies sit in between, for example, having little to no leverage at entry when revenues and any loans are used for growth plans, facility expansions, and business optimization projects. As value add investments are de-risked and more cash is available for debt service, managers may increase leverage commensurately.

Since 2000, core and core plus strategies have dominated the investible universe of commingled infrastructure funds globally, representing 62% of the annual vintage capital raised, ranging from 45% to 90% across the period, as illustrated in Exhibit 3 below. Value add strategies comprise the next largest segment, averaging 24% over the period shown. Opportunistic strategies have represented about 5% to 15% of the annual vintage totals, with the exception of a few years. Debt has fluctuated between being a modest amount of the total at less than 5%, to greater than 10% of the capital raised.

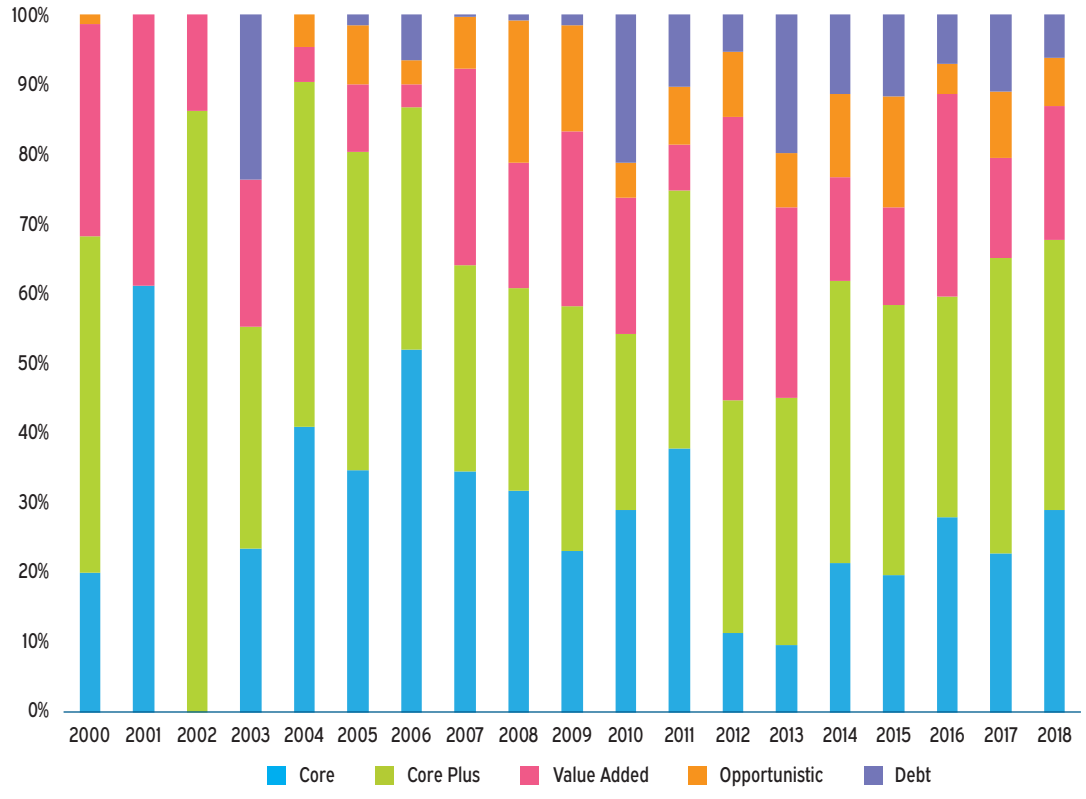


EXHIBIT 3
Infrastructure Funds Capital Raised Globally by Risk-Return Profile as a Percent of Total Vintage Year[5]

[5] Source: Preqin

Geography

Making international investments is an important way to diversify a portfolio and to participate in global economic movements. Over the past 18 years, the geographic distribution of the total capital deployed into private infrastructure was 36% Europe, 29% North America, 14% Asia, 7% each to Australasia and Africa, and 6% to South America.

Investments outside of the US can be segmented into two major geographies: the developed world, including Canada, most of Western Europe, Japan, and Australia; and the developing world, including many countries in Asia and Latin America, as well as essentially all of Africa, the Middle East, Eastern Europe, and Russia. Investments in developed countries offer similar categories of risk and reward attributes as those in the US. This is largely because these regions possess similar political, regulatory, and legal frameworks as the US. Developing (inclusive of emerging and frontier) markets are generally characterized by economies with higher economic growth, but with less secure and predictable political, legal, economic, and financing frameworks. Comfort with these risks is more difficult to achieve and tends to require a higher level of experience and insight by managers. In any investment not denominated in US dollars, currency risk is also a consideration, and managers' hedging policies vary.

US and North America focused funds dominate the investment universe with cumulative fundraising at $300 billion, while managers targeting Europe have raised $210 billion, and those focusing on Asia at $80 billion, and the rest of the world at $60 billion, as seen in Exhibit 4 below. From a US investor's perspective, while institutional quality ex-US private infrastructure investments were not as readily available in the same relative amounts 10 to 15 years ago compared to international public markets opportunities, the number of strategies has steadily increased. Options include managers with global mandates, as well as managers with specific ex-US mandates, in both developed and developing markets. Ideal strategies from a diversification standpoint will possess return drivers differentiated from domestic ones, diversified risk exposures, complementary positioning in economic cycles, and unique opportunities.

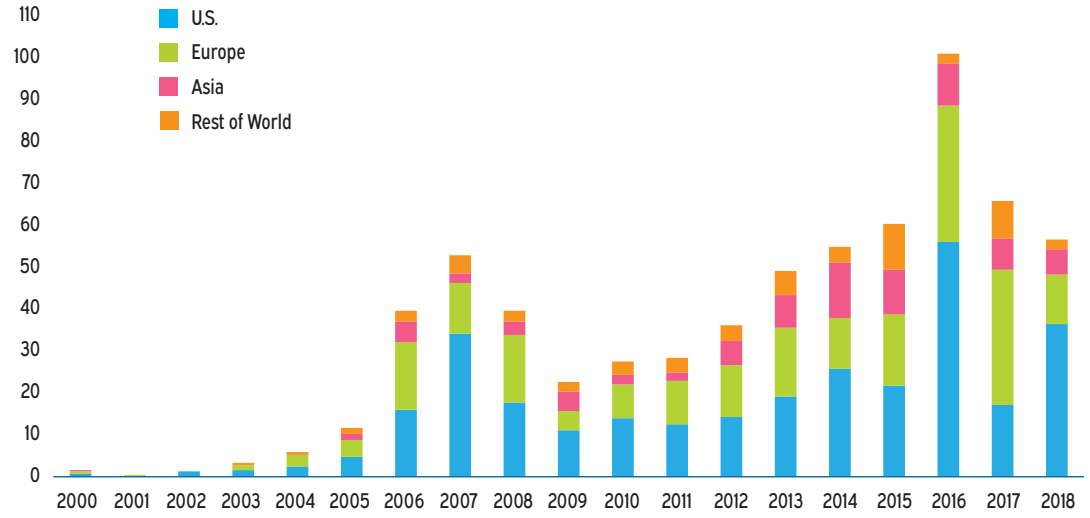


EXHIBIT 4
Infrastructure Funds Capital Raised Globally by Main Geographic Focus, by Vintage Year[6]

[6] Source: Preqin

Sectors

Sector-diversified funds attracted 60% of the capital committed to vintage years 2000 to 2018 across all risk-return categories, with the remainder allocated across several broad categories: 17% to renewable energy; 13% to energy; 7% to transport; and 2% or less each to social, telecommunications, utilities, and waste management. Within risk-return categories, there are no major sector differences, with the exception of relatively higher concentrations of capital in strategies targeting core plus renewable energy, energy infrastructure debt, and core social infrastructure funds. Many sector-diversified funds tend to focus on three or four sectors, and even sector-specific managers often focus on particular sub-sectors. Exhibit 1 provided a listing of major sector categories and types of assets in each.

Deal-level data illuminates the historically investible universe by sector in a way beyond the fundraising data. Exhibit 5 below shows a sector breakdown for almost $400 billion in total deal value across 9,200 individual deals with values reported for 2000 through 2018 (out of 33,600 records). Reported values clearly increase over the period, and the after-effects of the reduced fundraising around the GFC appears to be evident in the drop off in deal values during 2010 – 2013. The most visible recent increase is in reported telecommunication deals, reaching $9 billion and $10 billion in 2017 and 2018, respectively. Renewable deals look healthy post-GFC, taking in $5 billion to $9 billion annually.

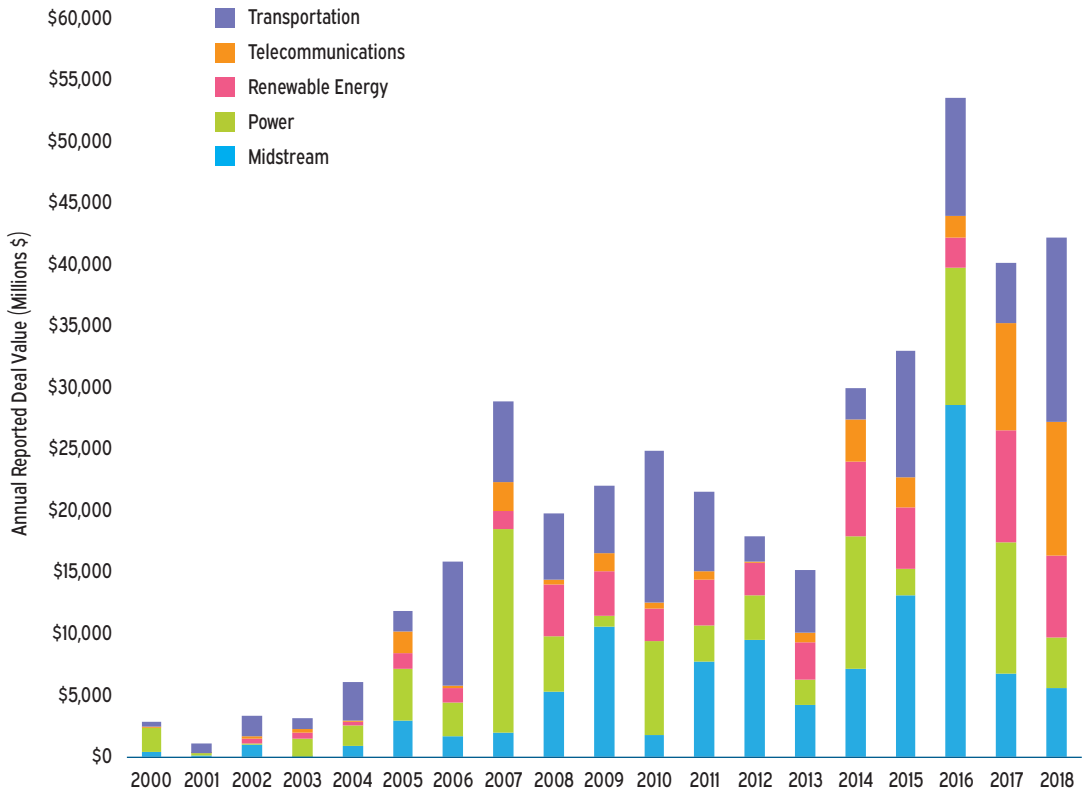


EXHIBIT 5
Infrastructure Deals by Sector and Transaction Yeary Period[7]

[7] Source: Preqin. Excludes data for 2,100 deals for the following sectors to simplify the chart, which typically collectively average 10% of the total: social; utilities; water and wastewater; waste management; and other.

On a relative basis, across the period, the level of investment in some sectors has been dynamic, either increasing or decreasing over time, while others have seen a fairly steady proportion of capital. For example, the relative level of capital deployed into midstream and renewables has increased, while that invested in the power sector has decreased. In the last 10 years, transportation has ranged from 10% to 30% of the deal capital in any given year, down from 20% to 40% annually before the GFC. Telecommunication investments have steadily increased from the mid-single digit range to over 10% in 2014 and over 20% in 2017 and 2018, as a percent of annual totals. Utilities, waste management, and water/wastewater uptake has been steady on a relative basis, representing 5% to 10% of the total in most years. However, as visible in Exhibit 5, even where sectors are receiving a lesser share of the capital, absolute investment levels have increased in almost every sectors.

Infrastructure as an inflation hedge?

A common purpose of institutional infrastructure allocations is inflation protection. Infrastructure assets derive their values from their physical properties, which are expected to maintain or increase in value during times of unexpected moderate to high inflation. Additionally, many infrastructure investments' revenue streams have explicit inflation links under contract or concession schemes.

For better or worse, there has not been a period of high inflation – the kind that eats away at asset prices – in 40 years. Therefore, while we would like to put the theory of infrastructure as an inflation hedge to the test, there is insufficient data to do so.

Private infrastructure return targets and performance

In the current market, private infrastructure funds' return targets across the strategy categories are roughly stratified as presented in Exhibit 6 below, reflecting Meketa's vantage point on Ipart, since the expansion of the asset class around 2006, reflecting the impact of the GFC, development of more realistic expectations, and the influx of investor demand for assets. Demand for core and core plus investments has been particularly strong, increasing competition, driving up acquisition prices, and decreasing underwritten returns.

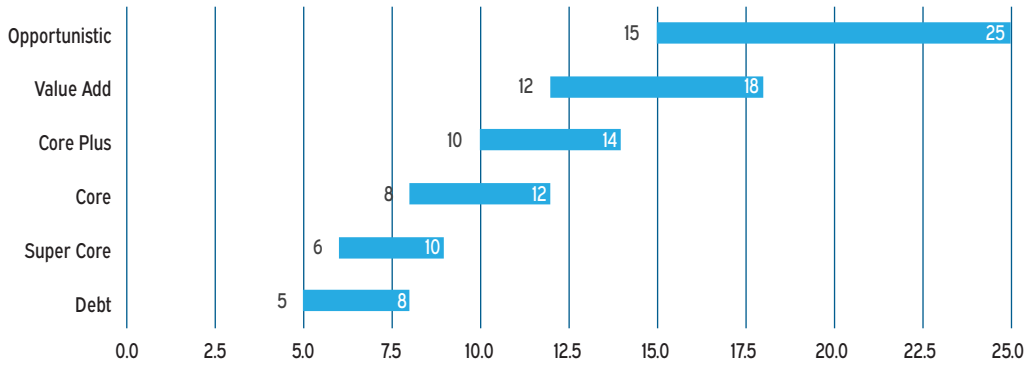
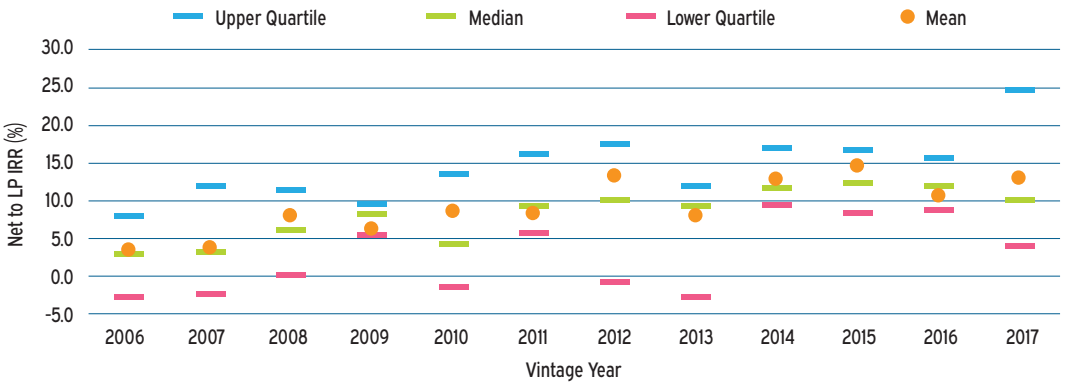


EXHIBIT 6
Gross Target Returns (IRR) for Private Infrastructure Funds Strategies

The sources of benchmark return data for infrastructure are less robust than those for private equity, real estate, and some natural resources. This is because fewer funds existed and thus reported into benchmark providers. There is no long-term index for core infrastructure that is comparable to those provided for core real estate by the National Council of Real Estate Investment Fiduciaries ("NCREIF"). Burgiss, Cambridge Associates, and Preqin, among others, offer vintage year performance data for private infrastructure.

Exhibit 7 is an analysis of the vintage year performance of non-core private infrastructure by quartile and dollar-weighted mean performance. Over the 12 vintage years analyzed, the general trend is an increasing mean and narrowing spread between the upper and lower quartiles. Across the vintage years, the weighted average performance is 10.3% for mean vintage year returns. Since 2011, the median net IRR by vintage year has ranged between high single digits and low double digits. This is perhaps attributable to managers in the aggregate becoming more sophisticated about the asset class, more rigorous in their underwriting, and more focused on business plan execution.

The table portion of Exhibit 7 provides the number of funds and amount of capital for each year. Most years have 12 to 18 funds, except for 2009 and 2011, which are sparse at 5 each. Most years are well capitalized, except again 2009 to 2011 reflecting post-GFC effects, with recent highs reflecting successful managers increasing fund sizes. The more managers and capital in a vintage year, the more robust and representative the benchmark will be, all else equal.



$ in Billions	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Capitalization	$21.5	$19.3	$23.3	$9.6	$10.1	$7.4	$15.9	$16.7	$24.4	$23.8	$35.4	$30.6
# of Funds	15	12	12	5	13	5	13	12	17	17	15	18
Avg. Size	*$1.4*	*$1.6*	*$1.9*	*$1.9*	*$0.8*	*$1.5*	*$1.2*	*$1.4*	*$1.4*	*$1.4*	*$2.4*	*$1.7*

EXHIBIT 7
Net IRR Returns for Private Infrastructure, All Strategies by Vintage Year, as of June 30, 2019[8]

[8] Source: Burgiss

Compared to other benchmarks, including inflation, as well as other asset classes, such as Private Equity, Real Estate and Natural Resources, Infrastructure has shown consistent returns with one-, three-, five-, and ten-year returns all between 10% and 12%, as seen in Exhibit 8 below. Over the past 10 years, private infrastructure returns have delivered on their promise for stable returns that stay ahead of inflation. Infrastructure has also been in line with or outperformed the MSCI All Country World Index.

	1 Year	3 Year	5 Year	10 Year
C | A Infrastructure	10.7	11.9	10.6	10.0
C | A Private Equity	13.5	16.3	12.7	15.2
C | A Non-Core Real Estate	6.6	9.5	10.2	10.7
C | A Natural Resources	-5.1	5.8	-1.3	4.8
CPI	1.6	2.0	1.5	1.7
MSCI ACWI	5.7	11.6	6.2	10.1
DJ Brookfield Infrastructure	12.7	7.6	4.4	12.1

EXHIBIT 8
End to End Returns[9]

[8] Source: Cambridge Associates ("C | A") as of June 30, 2019.

Implementation

There are several implementation decisions that should be considered prior to executing an allocation to infrastructure, including portfolio construction, choosing appropriate investment vehicles, understanding investment fees, and selecting a benchmark.

Portfolio construction

Within the infrastructure portfolio, investors must set the relative allocations to core and non-core strategies based on their program's target return, risk preferences, cash yield objectives, views of relative value, and any geographic exposure goals. As discussed earlier, expected returns and assumed risk increase across the core to non-core spectrum. With respect to the balance of income versus total return, as a rule of thumb, investors can expect core to deliver about two-thirds of its net total return in the form of cash yield, and the balance from net appreciation, while value add returns might be 50:50 income to appreciation, and opportunistic little to no income. Geographically, core and value-add global offerings are readily available, but opportunistic strategies may be regional-specific, including focusing on emerging markets. Finally, many institutional investors have a preference for the lower risk core assets, and their demand has helped drive up core pricing on a relative basis, leading many investors (including some of those same institutions as they build a diversified portfolio) to look for better entry pricing in the non-core arena.

As a consequence of this exercise, different investors will end up with modestly to markedly different infrastructure portfolios. One US pension plan may build a portfolio with 70% to 80% core, more than half its investments in the US, and little to no opportunistic or emerging market exposure. Another US pension may focus on value-add strategies, avoiding core pricing, but still building a portfolio well-diversified by sector and geography. A third US pension may be attracted to the higher returns targeted by opportunistic strategies, some of which follow private equity-style playbooks to invest in businesses that own or otherwise are involved with infrastructure assets. Each investor can tailor its portfolio to its program objectives and preferences.

Investment vehicles

Several categories of investment vehicles are available for investors who wish to invest in infrastructure. The private vehicles primarily include open-end and closed-end commingled funds, separately managed accounts, co-investments, and direct joint ventures. The publicly-traded vehicles are traditional open-end funds and strategies (like mutual funds) whose share prices fluctuate daily.

Most of the current universe of infrastructure funds is structured similarly to other types of private markets partnerships. They are closed-end private funds, generally with terms between ten and fifteen years, with several one-year extensions. They are structured with an investment period of three-to-five years and will usually invest in five-to-15 assets or portfolio companies. Within the infrastructure space, some funds have longer terms of up to 20 or 25 years, and may have longer investment periods too, if the strategy requires more time to execute and/or if investors want longer hold periods in keeping with the underlying asset lives.

Private market investors have the ability to add value through control positions and long-term project views. A control position in its investments will enable the fund manager to implement high quality management teams, disciplined capital deployment, and minimize company expenses. These factors will be key to providing excess returns over similar public market investments. For these reasons, we have a preference for achieving the majority of an investor's allocation to infrastructure via private market funds. However, it may take several years to fully achieve the desired target allocation via investments in this format.

Like real estate, the infrastructure fund universe includes open-end vehicles with no specified term end that allows the manager indefinite hold periods and eliminates the imperative to exit investments. Most open-end infrastructure funds focus on core and core plus strategies, investing in assets that generate most of their return from cash yield. However, some open-end core funds do have a small allocation to development projects that reflect build-to-core strategies and other types of value-add or opportunistic investments. The structural advantages of open-end funds are several. They will typically call the entire capital commitment at once with no J-curve or blind pool risk, since investors acquire units of a portfolio of visible, operational assets. Additionally, new commitments can usually be made at any time, as the fund is perpetually open, although there may be queues of investors waiting for the manager to call their capital, and some open-end funds have defined windows for periodic new commitments. They also are theoretically more liquid than their closed-end counterparts, with partial or full redemption options, usually after an initial several-year lock-up period. In practice, we have observed these options usually work smoothly, however the timing of redemption is not guaranteed and managers are not required to sell assets to meet such requests.

Separately managed accounts can also provide private infrastructure exposure, while allowing for a customizable strategy, often with lower fees. Co-investments or direct joint ventures can provide selective exposure to individual opportunities, typically with no fees, but each increases concentration risk. These alternatives to commingled funds are most accessible to larger investors with sufficient in-house or outside resources and specialization to support the extra due diligence and legal analysis these vehicles can involve.

Investment fees

Like private equity partnerships, the fees on private infrastructure funds are higher than public market options, and generally include both a management fee and a performance-based fee (a.k.a. "carry") that kicks in above a pre-specified preferred return (a.k.a. "hurdle"). Across infrastructure funds, the management fee and carry tend to be lower for open and closed end core funds, and higher for value add and opportunistic strategies. For example, base management fees can range from 75 basis points up to 200 basis points, carry from 0% to 20%, and hurdles from 0% to 8%, with a 50% to 100% catch up. Investors making large commitments may receive lower fee rates at one or more break levels. All of the costs and fees associated with private infrastructure investing are higher than for public market securities and will be dilutive to returns. The fee structure creates a gap between gross and net returns of several hundred basis points, depending on the specific terms and manager's performance.

As with all private market investments, an allocation to infrastructure will require institutional investors' additional time and resources. Administratively, the capital calls and distributions associated with private infrastructure funds are unpredictable, so investors would need procedures to accommodate these cash flows reliably and efficiently. These assets will also require additional monitoring by the investor.

J-curve

Another characteristic that many infrastructure funds share with private equity partnerships is the J-curve, which is the pattern of flat to negative returns in the early years of a partnership. However, this is mitigated by the income stream generated by many infrastructure assets shortly after their acquisition. Hence, the J-curve should be less pronounced for infrastructure investors, who can receive anywhere from 3% to 4% up to 9% to 10% or higher cash yield, than that to which private equity investors are accustomed. Additionally, open-end funds with existing investments and closed-end funds with seeded portfolios will also have lower or no J-curve.

Timing

Meketa believes that vintage year diversification is an important element to achieving attractive returns within a private markets portfolio over time, and this holds true for infrastructure. A market timing strategy is difficult to successfully execute in general but particularly within private markets fund structures where general partners have considerable discretion about when to deploy capital over a multiple-year time horizon. Additionally, having the discipline to allocate capital during times of market disruption can be difficult for investors in practice. Consequently, private infrastructure investors are largely reliant on the general partners to make capital allocation decisions within the boundaries of their strategy mandate, with respect to sectors, geographies, and other possible tactical attributes (e.g., buy versus build, asset scale, etc.).

Infrastructure investors are more readily able to make strategic allocations themselves by selecting sector-specific and/or geographic-focused strategies to complement broader exposures secured through commitments to more diversified strategies. For example, with investments in several global and regional (e.g., North America, Western Europe) sector-diversified funds, additional commitments to managers specializing in digital communications, midstream, and renewables, and emerging markets would implement positive views about outsized growth in those areas and seek attractive risk-adjusted returns.

Benchmarks

Benchmarking is important because it lets you measure and evaluate performance, as well as the decisions that led to those outcomes. Historically, infrastructure investors mainly have relied on an absolute return target linked to inflation, reflecting many institutions' stated objective for their infrastructure portfolio: inflation protection. Their benchmark has typically taken the form of "CPI Plus", using the US Consumer Price Index plus anywhere from 300 to 500 basis points, depending on the positioning of the portfolio across core, value-add, and opportunistic strategies. This approach has been favored because there was no commonly accepted benchmark for private infrastructure, like the NCREIF ODCE is for real estate.

The other option that has been available to infrastructure investors for some time is public market indices. While these indices include many of the same sectors in which institutions commonly invest, the sectors, weightings, and geographies will tend to be quite different. Moreover, public market indices are marked to market on a daily basis. This can lead to much greater volatility than is observed in private markets, and significant tracking error between a private markets portfolio and the benchmark, even over periods of multiple years. However, using a public market benchmark can help investors assess whether it made sense to take on illiquidity risk.

Recently, private market fund composites have emerged as a viable benchmark for infrastructure portfolios, similar to what they have long been for asset classes like private equity. Multiple private equity data providers, including Burgiss, Cambridge Associates, PitchBook, and Preqin, now offer benchmark data with varying levels of coverage. Key considerations in evaluating the robustness of the data for benchmarking purposes include the number of funds tracked for each vintage year and how the provider secures the performance data. Ideally, the provider will have a sufficient number of funds in each vintage year to calculate a median return, and will source data through direct reporting of cash flows in order to provide end-to-end returns (e.g., one-, three-, five-, and 10-year returns), in addition to returns by vintage year. Providers accumulating data through financial statements will have higher consistency each quarter with the number of funds reporting than those secured through Freedom of Information Act (FOIA). Additionally, data sourced only through

FOIA requests can be aggregated to produce vintage year returns, but not end-to-end returns. Also, obtaining data via FOIA's may lead to challenges (e.g., timeliness and re-statements) for quarterly reporting comparisons. Other considerations include the provider's underlying geographic exposures and fund size representation.

Meketa has long believed that an allocation to private infrastructure provides important benefits to institutional portfolios, stemming from asset class diversification, downside protection via contracted revenues, and reduced volatility via cash-yielding investments.

While the options and coverage for infrastructure are improving and expanding, the robustness of fund composites is still limited compared to other asset classes like private equity, which has a much larger data set and a longer history. Extra challenges for selecting and monitoring any private benchmark stem from the underlying components not always being readily available, and survivorship bias if underperforming investments cease performance reporting, artificially increasing the overall private market benchmark returns. Still, the fund composite most closely represents the opportunity set available to infrastructure investors and its use would reduce the tracking error inherent in the other two approaches. More than the other options, it helps programs evaluate their asset allocation and fund selection decisions.

For large and highly-diversified private infrastructure portfolios, it may be appropriate to use more than one benchmark or to develop a customized benchmark, which could include a combination of CPI Plus, a sufficiently analogous public market index, and/or a widely published private infrastructure composite.

Summary

Meketa has long believed that an allocation to private infrastructure provides important benefits to institutional portfolios, stemming from asset class diversification, downside protection via contracted revenues, and reduced volatility via cash-yielding investments. Underlying assets with long useful lives and durable income are a good match for investors with long-term time horizons. And for institutions that want to invest globally, private infrastructure offers as much as, if not more than, other private asset classes.

Infrastructure investors have a wide range of choices along the risk-reward spectrum, with some opportunities having similar profiles to corporate bonds with regular coupons, a mid-range offering a mix of yield and appreciation, and a more private equity-like segment that depends on business transformations. These alternatives exist across the core, value-add, and opportunistic risk categories typically applied to the asset class. The unifying theme across the spectrum is essential, tangible assets that underpin critical economic sectors and activities.

The manager universe data clearly demonstrate that the private infrastructure market is well-established and growing with respect to number of managers, strategies, geographic focus, and capacity to accept and deploy capital. The opportunity set is robust and accessible to institutional investors of all scales, from the smallest that can invest via fund-of-funds, to the typical pension that will invest via commingled funds, to larger and more sophisticated investors that can commit to separate accounts, co-investment vehicles, and direct investments.

Finally, the asset class has performed well within ranges and at levels that would have been expected given the various economic conditions experienced over the last fifteen years. While some earlier vintage year performance was lower than hoped, post-GFC performance on average has been quite strong. This is perhaps attributable to managers in the aggregate becoming more sophisticated about the asset class, more rigorous in their underwriting, and more focused on business plan execution. Plus, they have the benefit of applying lessons learned, not only from prior infrastructure investments, but from other asset classes as well. The benefits of infrastructure allocations have been clearly visible over the last decade, and we believe infrastructure should have a role in most institutional investors' portfolios.

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