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Infrastructure: Opportunity for yield and diversification

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Infrastructure is a real asset providing institutional investors with distinct advantages over traditional and alternative asset classes.

The asset class can be accessed through different parts of the capital structure to obtain a range of potential benefits: higher yield and total return, lower volatility, and generally low correlations that can improve overall portfolio risk-adjusted returns. What distinguishes infrastructure from other alternatives is long-term stability of high income returns that are less sensitive to economic cycles. The yield advantage of this asset class is defined

EXECUTIVE SUMMARY

- Infrastructure is a real asset providing institutional investors with distinct advantages over traditional and alternative asset classes: potential for higher yield, lower volatility and generally low correlations.
- Benefits reflect infrastructure's unique characteristics: location-specific natural monopolies generating predictable high income through long-term contracts for essential services.
- Infrastructure spans four categories — private and public investments in equity and debt — with diverse characteristics allowing investors to customize a portfolio's risk-return profile.
- Analysis of historical performance showed that each category improved risk-adjusted returns when added to traditional stock-bond portfolios.
- Institutional investors should consider a dedicated allocation to infrastructure investments based on diversification benefits not available from other asset classes.

by its unique characteristics: mostly location-specific natural monopolies that generate usage fees through long-term contracts for essential services, such as energy, transportation, and water. Another key benefit is a record of lower volatility and risk relative to traditional asset classes, based on a combination of government or contractual guarantees, steady income often indexed to inflation, and high barriers to entry.

Infrastructure isn't monolithic. The diversity of opportunities — spanning a range of markets, sectors and funding sources — supports customizing portfolios for a desired risk-return profile. The asset class can be divided into four categories consisting of private and public investments in equity and debt. Selecting among the four categories allows investors to tailor portfolio characteristics, such as income, total return, duration, liquidity and capital commitment. Although institutions have historically favored private investments, public investments — including municipal bonds — offer exclusive access to certain infrastructure assets and provide liquidity. Investing across the four categories allows investors to assess which offer better relative value, based on desired investment profile, the economic cycle and local market conditions. Moreover, combining investments in multiple categories offers the potential to improve portfolio diversification based on infrastructure's attractive risk-adjusted returns and moderate correlations among the four categories.

INVESTMENT OPPORTUNITIES

Investment opportunities are expanding globally with powerful trends — demand for sustainable energy and the critical need to replace roads, bridges, schools and other facilities vital to healthy economies. Although infrastructure spending is increasing, the global shortfall is estimated at up to $1 trillion a year, or about $18 trillion between 2016 and 2040, according to Oxford Economics.[1] The U.S. has the largest estimated spending gap at $3.8 trillion by 2040 — double the gap in China. Tight government budgets are expected to leave a shortfall of $10 trillion to $25 trillion by 2030, creating a large opportunity for private investment.[2]

INCREASING DEMAND FOR INFRASTRUCTURE ASSETS

Despite strong returns in recent years, heavy demand for infrastructure assets is bidding up prices and potentially eroding future returns. Unlisted infrastructure fundraising set another record at $69.5 billion in 2017, and continued to accelerate in the first half of 2018.[3] Assets under management more than quadrupled in the past decade to $418 billion in June 2017.[4] The greatest concern of fund managers remains high asset valuations making it more difficult to meet investor return expectations. More than half, or 57%, of fund managers surveyed by Preqin are reducing their targeted rate of return for new funds.[5] Nonetheless, institutional investor demand for infrastructure's high and stable income returns and low asset correlations is expected to continue unabated.

Despite rising valuations, major pockets of attractive risk-return opportunities are available, particularly for experienced investors with proprietary access to deal flow. Competition for assets places a premium on investors having the scale, reputation and industry contacts providing access to more attractive private "club" deals not sold through public auctions.

INFRASTRUCTURE CATEGORIES

Infrastructure's four categories — equity and debt, both private and public — offer investors the opportunity to customize a portfolio's risk-return profile by incorporating diverse investment characteristics.

Equity

Infrastructure equity offers reliable cash flows — often generated by long-term contracts — with returns less sensitive to economic cycles than other investments. Despite higher volatility of total returns, predictable cash-flow yields often in high single digits are attractive to institutional investors for asset-liability matching. Unlike bonds with static yields, equity cash flows have the ability to grow with operational improvements or economic growth, providing a hedge against inflation. Cash flows represent a much higher percentage of total returns than other equities. As a result, infrastructure has typically returned a larger share of the market's upside than the downside, providing better upside/downside capture ratios than traditional equity investments. Institutional investors often use both private and public equity for diversification — the mix depending on desired yield, maturity and volatility.

Private equity

Private equity represents direct investments in unlisted companies or private investments in public companies. This category generally offers higher yields than typically are available in public equity investments, lower volatility, and greater potential for capital appreciation and competitive returns. A key advantage is the ability to customize by selecting specific assets in particular subsectors matching client needs for yield, growth, duration and asset-liability matching. In addition, the opportunity to influence governance through covenants provides greater control over strategy, growth opportunities and risk management.

Private equity investments generally require large capital commitments, often $50 million or more. Investors must be able to tolerate limited liquidity and the lack of a public market for investors who want to sell.

Opportunities representing core investments with stable income streams include contracted renewable energy, midstream pipelines with volume guarantees, liquefied natural gas storage, regulated utilities and transportation. One example is a privately operated toll road, I-595 Express LLC in southeast Florida used by more than 180,000 vehicles daily. This highway was built through a public-private partnership and includes express lanes that charge tolls, providing predictable cash flows to investors via a 35-year concession agreement that reduces traffic demand risk.

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*Infrastructure equity's **predictable high cash-flow yields** are attractive to institutional investors for asset-liability matching.*

Core-plus investments, such as telecommunication towers, offer higher yields, growth potential and more risk. Data centers, for example, can offer a combination of predictable cash flows from long-term contracts and capital appreciation potential as demand for cloud computing increases.

Public equity

Public equity investments — listed on stock exchanges — appeal to investors seeking high returns, growth potential and diversification. Despite higher volatility, infrastructure stocks have defensive characteristics, including higher yield and lower beta, that historically have captured more of the market's upside and less of the downside compared to global equities.

Investors might choose public over private equity investments if they wish to make a lower initial capital outlay or take advantage of greater liquidity and the ability to diversify across regions and sectors. In addition, projects may trade at a discount relative to their private equity counterparts, depending on the stage of the business cycle. An example is a China-based integrated environmental services provider addressing burgeoning demand for pollution-control facilities, including waste-to-energy, water purification and hazardous waste treatment. The company offers high growth potential based on increasing project awards from China's government agencies.

Although institutional investors traditionally favored private over public equity, listed infrastructure stocks are receiving increased consideration. In fact, access to some assets is available only through public stock exchanges, including certain privatized airports, toll roads, and subways in Europe, Australia and Asia.

Demand for infrastructure investments has increased privatization through public-private partnerships. Listing privatized assets on public exchanges — examples include a toll road operator in France and an airport manager in Spain — increases infrastructure investment opportunities in public markets.

Debt

Institutions seeking stable long-term cash flows may favor public or private infrastructure debt, which offers lower risk than equity due to its higher position in the capital structure. Infrastructure debt historically has provided higher yields than similarly rated corporate bonds. Another important advantage is very low default rates. Moody's found that infrastructure debt had substantially lower default and loss rates, compared to non financial corporate (NFC) issuers. Infrastructure debt had average default and loss rates of 0.7% and 0.3%, respectively, compared with 9.8% and 6.2%, respectively, for NFC bonds over a five-year time horizon.[6] Infrastructure credit ratings were more stable — only 40% as volatile — compared with NFC ratings, driven largely by U.S. municipal securities. Institutions seeking higher yield and capital appreciation potential, but sensitive to volatility, may favor hybrid investments. Convertible bonds, for example, offer a higher yield that can increase with economic growth, and potential for capital appreciation if the underlying company's value rises.

> *Investors can select private debt in specific sectors and across the capital structure to customize a desired risk-return profile.*

Private debt

Private debt — not publicly traded — has typically offered higher yields as a tradeoff for limited liquidity, compared with public debt. Strict governance through covenants has reduced default and loss rates below levels suggested by the higher yield. Investors may choose private debt in specific sectors if they seek to customize the yield or match the duration of long-dated liabilities. Subordinated private debt, such as mezzanine capital, offers higher yield with higher risk and shorter tenors.

Segments offering attractive spreads over equivalent public bonds include student housing and energy management systems in higher education and renewable energy. Loans to renovate or construct new student housing are a rapidly growing market, offering a captive audience and high occupancy rates with protections against overbuilding. For example, Howard University in 2016 signed a 40-year contract to renovate and manage dormitories with 2,200 beds, offering attractive yield, long duration and covenants to reduce risk. In renewable energy, solar and wind debt at the holding company level offer better relative value and higher yields, compared with operating company debt. Investor safeguards include long-term power purchasing agreements, protection against additional debt and strong coverage ratios.

Investing in more attractive private debt opportunities often requires an experienced partner. Demand for private debt has been strong, with traditional bank-driven deals significantly oversubscribed and offering small allocations to investors. The most attractive opportunities are available through "club" deals offered to as few as 10 investors with established relationships and strong track records of working well with operators and investors.

Public debt

Although public debt includes corporate bonds and hybrid securities, municipal bonds represent the largest market, funding most U.S. public infrastructure. Infrastructure financed by municipal bonds consists largely of investment-grade quality, fee-generating public projects, such as water and sewer systems.[7] Advantages include geographic exposure across the U.S. in a highly liquid market considered quasi-sovereign based on its high credit ratings — typically AA — and historically low default and loss rates. An example is $2.5 billion in municipal bonds issued in 2016 for reconstruction at New York's LaGuardia Airport and funded by airport revenues.

Municipal bonds are particularly attractive to non-U.S. institutional investors facing sovereign debt yields ranging from less than zero to less than 1%, such as in Japan, Germany and France. Compared to similarly rated corporate bonds, municipal bonds offer similar yields with more stable credit ratings and much lower default and loss rates.

Credit research is vital to successful investment in the municipal market because of pricing inefficiencies and a concentration of credits among the highest rating categories despite variation in quality. For example, yields can range from 1.5% to 4.5% for 10-year bonds with the same credit rating and duration. In addition, strong global demand for bonds from widely followed issuers, such as the states of New York and California, have driven up prices and compressed yields. Skilled credit research can identify better value with similar risks from tens of thousands of other less well-known issuers and less-followed sectors.

Exhibit 1: Infrastructure's four categories

Selection among the four categories will depend on preferences for different characteristics, such as liquidity, return, volatility and investment size. Depending on their goals, investors may include infrastructure in their allocations to real assets, fixed income or global equities.

	PRIVATE	PUBLIC
EQUITY	***Benefits:*** • Higher yields than general public equities • Growth potential • Generally low correlations to other asset classes • Lower volatility than public equity • Inflation/deflation hedge ***Risks:*** • Volatility • Illiquidity • Operational, regulatory ***Investors:*** Qualified institutional investors	***Benefits:*** • Higher yields than general public equities • Growth potential • Diversification • Highly liquid (daily valuation) • Inflation/deflation hedge ***Risks:*** • Volatility • Security and sector risks • Operational, regulatory, market ***Investors:*** Institutional and individual investors
DEBT	***Benefits:*** • Higher yield than equities and public debt • Relatively stable returns — lower volatility than equity • Lower risk of losses — higher in capital structure, covenants for governance ***Risks:*** • Illiquidity • Operational, regulatory • Inflation • Duration (interest-rate risk) ***Investors:*** Qualified institutional investors	***Benefits (Municipal bonds):*** • Yields comparable to corporate bonds • Very low default and loss risk • Highly liquid, $3.7 trillion market • Broad sector diversification • 30-year bond availability to match long liabilities ***Risks:*** • Interest-rate risk • Inefficient market • Operational, regulatory, market ***Investors:*** Institutional and individual investors

DIVERSIFICATION BENEFITS

Infrastructure's generally low to moderate correlations with traditional and alternative asset classes historically have provided diversification benefits. The high income component of total returns and steady long-term cash flows tend to reduce correlations and volatility, helping to support portfolio asset-liability matching. For example, the four infrastructure categories have had generally low correlations with global bonds, but somewhat higher correlations with global stocks (Exhibit 2). The four types also have moderate correlations to each other, providing added diversification benefits when combined in a portfolio. Reflecting how it differs from other real assets, infrastructure has generally low or negative correlations with private real estate.

METHODOLOGY

Nuveen's analysis of infrastructure investment returns and correlations was based on a 13-year time period, 2005 – 2017. The time period reflected the limited track record of the public index selected as a proxy for private infrastructure debt returns. The Dow Jones Brookfield Global Infrastructure Corporate Bond BBB Index (31 March 2004 inception) was selected, given the lack of publicly available index returns for private debt.

Calculations used annual returns to reduce the smoothing effect of periodic appraisals used in private real asset valuations. Annual returns help to maintain the correlations and volatilities across asset classes.

Exhibit 2: Infrastructure's generally low to moderate correlations with other asset classes (2005 – 2017)

		Infrastructure indexes						
Annualized		Private equity	Public equity	Private debt (public proxy)	Public debt (municipal)	Global fixed income	Global equity	Private real estate
Infrastructure indexes	Private equity	1.00	0.79	0.22	0.15	0.22	0.60	0.58
	Public equity		1.00	0.65	0.47	0.22	0.88	0.24
	Private debt (public proxy)			1.00	0.62	0.56	0.72	-0.45
	Public debt (municipal)				1.00	0.22	0.49	-0.16
Broad market indexes	Global fixed income					1.00	0.10	-0.31
	Global equity						1.00	0.04
Real estate	Private real estate							1.00

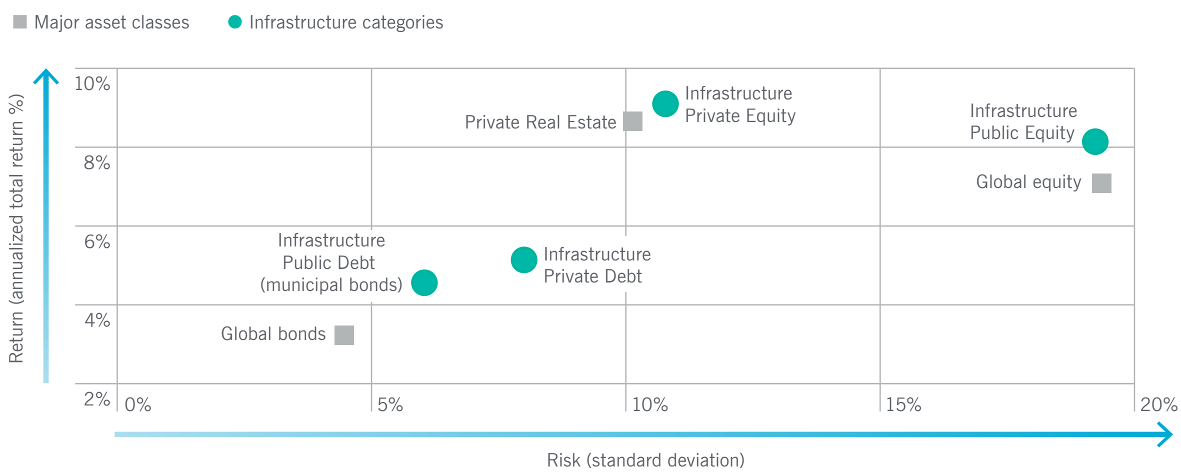
Sources: Cambridge Associates, NCREIF, Bloomberg, FactSet, Nuveen, LLC. Calculations reflect annual returns for the 13-year period, 01 Jan 2005 – 31 Dec 2017. Asset classes are represented by the following indexes: infrastructure private equity (Cambridge Associates index, based on net internal rate of return (IRR) to limited partners); infrastructure public equity (S&P Global Infrastructure Index); infrastructure private debt proxy (Dow Jones Brookfield Global Infrastructure Corporate Bond BBB Index); infrastructure public debt (Bloomberg Barclays Municipal Revenue Bond Index); investment grade global fixed income (Bloomberg Barclays Global Aggregate Bond Index); global equity (MSCI All Country World Investible Market Index); private real estate (NCREIF Property Index). It is not possible to invest in an index. Performance for indexes does not reflect investment fees or transaction costs. Results may be significantly different for other time periods.

ATTRACTIVE RISK-ADJUSTED RETURNS

Infrastructure's historical performance overall has been superior to traditional asset classes. The four categories offered higher absolute and risk-adjusted returns, compared to traditional equity and fixed income, for the 13-year period, 2005 – 2017 (Exhibit 3). Infrastructure private and public equity offered both higher returns and lower volatility, compared with traditional equity. Infrastructure debt offered higher returns with higher volatility, compared with traditional fixed income.

Exhibit 3. Infrastructure's risk-return profile vs. major asset classes

Annualized return and standard deviation (2005 – 2017)



Performance and risk measures for infrastructure and major asset classes

Annualized returns, standard deviation, and Sharpe Ratio (2005 – 2017)

	Infrastructure indexes						
Annualized	Private equity	Public equity	Private debt (public proxy)	Public debt (municipal bonds)	Global fixed income	Global equity	Private real estate
Annualized returns	9.10%	8.14%	5.14%	4.56%	3.23%	7.09%	8.66%
Standard deviation	10.78%	19.23%	8.00%	6.04%	4.46%	19.36%	10.14%
Sharpe Ratio	0.73	0.36	0.49	0.55	0.45	0.30	0.73

Sources: Cambridge Associates, NCREIF, Bloomberg, FactSet, Nuveen, LLC. Calculations reflect annual returns for the 13-year period, 01 Jan 2005 – 31 Dec 2017. Asset classes are represented by the following indexes: infrastructure private equity (Cambridge Associates index, based on net internal rate of return (IRR) to limited partners); infrastructure public equity (S&P Global Infrastructure Index); infrastructure private debt proxy (Dow Jones Brookfield Global Infrastructure Corporate Bond BBB Index); infrastructure public debt (Bloomberg Barclays Municipal Revenue Bond Index); investment grade global fixed income (Bloomberg Barclays Global Aggregate Bond Index); global equity (MSCI All Country World Investible Market Index); private real estate (NCREIF Property Index). It is not possible to invest in an index. Performance for indexes does not reflect investment fees or transaction costs. Results may be significantly different for other time periods.

PORTFOLIO BENEFITS

Adding infrastructure to a traditional stock-bond portfolio offers the potential for meaningful improvements in return and risk. We address the impact of the four categories individually and combined, illustrating the potential to customize a risk-return profile with different mixes of equity and debt. The analysis is based on a range of fixed allocations to indexes representing infrastructure and traditional stocks and bonds, using returns for the 13-year period 2005 – 2017. Risk was measured by standard deviation and risk-adjusted returns by Sharpe Ratio.

Scenario 1: Adding infrastructure equity to a public equity portfolio

This analysis compared the risk-return profiles of portfolios containing 15% allocations to infrastructure equity — private, public and combined — with a 100% traditional global equity portfolio.

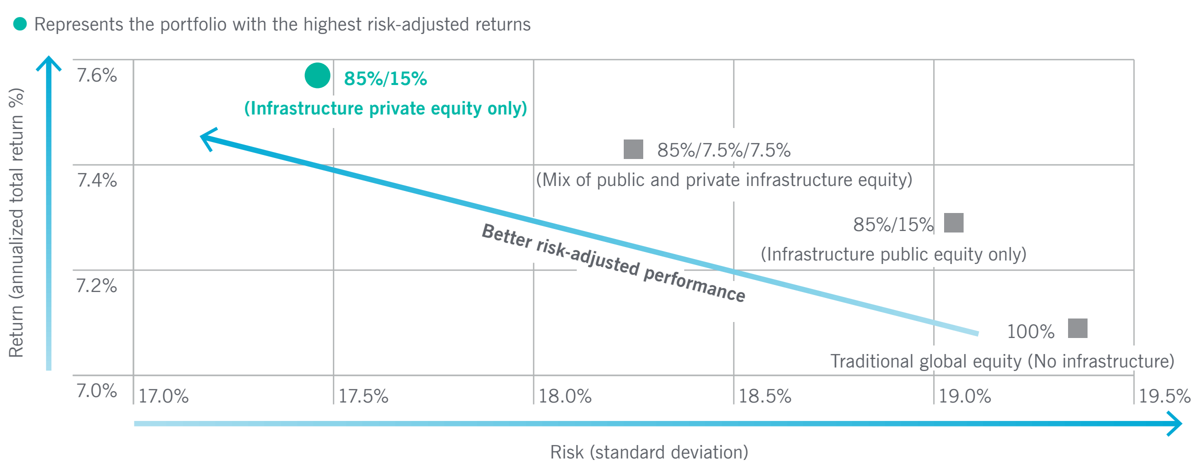
Infrastructure equity improved returns and reduced risk, producing higher risk-adjusted returns

RESULTS

- Infrastructure equity improved returns and reduced risk, producing higher risk-adjusted returns when added individually and in combination.
- Adding 15% private equity produced the highest absolute and risk-adjusted returns with the lowest volatility. Total returns increased 48 basis points, from 7.09% to 7.57%; volatility decreased 189 basis points, from 19.36% to 17.47%; Sharpe Ratio increased from 0.30 to 0.36.
- Adding 15% public equity improved risk-adjusted returns, compared with traditional global equity.
- Adding a combination — 15% split between private and public equity — produced middling results — higher risk-adjusted returns than public infrastructure equity, but lower than private infrastructure equity.
- Although additional increases to infrastructure equity allocations would further improve the risk-return profile, most investors would prefer to constrain allocations within reasonable limits.

Exhibit 4: Adding infrastructure equity to a traditional public equity portfolio (2005 – 2017)

Comparing risk and return: traditional global equity portfolio vs. adding 15% infrastructure equity



Sources: Cambridge Associates, Bloomberg, Nuveen, LLC. Calculations reflect annual returns for the 13-year period, 01 Jan 2005 – 31 Dec 2017. Asset classes are represented by the following indexes: infrastructure private equity (Cambridge Associates index, based on net internal rate of return (IRR) to limited partners); infrastructure public equity (S&P Global Infrastructure Index); global stocks (MSCI All Country World Investible Market Index). It is not possible to invest in an index. Performance for indexes does not reflect investment fees or transaction costs. Results may be significantly different for other time periods.

Scenario 2: Adding infrastructure debt to a traditional global fixed income portfolio

This analysis compared the risk-return profiles of portfolios containing 15% allocations to infrastructure debt — private, public and combined — with a traditional 100% global investment grade fixed income portfolio.

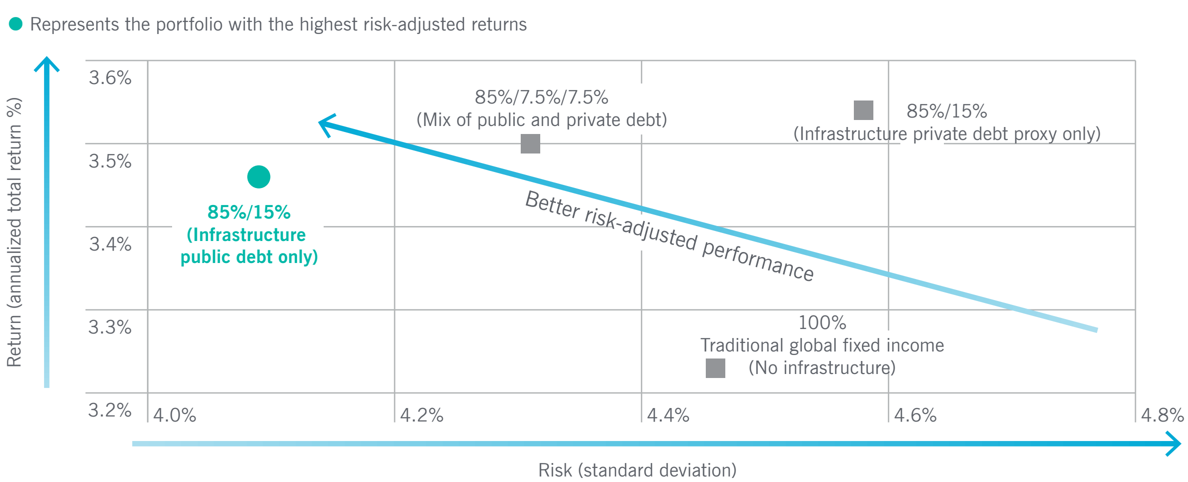
RESULTS

- Infrastructure debt improved both absolute and risk-adjusted returns when added individually and in combination.
- Adding 15% private debt produced the highest absolute returns, which more than compensated for its higher volatility.
- Adding 15% public debt resulted in the highest risk-adjusted returns. Municipal bonds' higher returns more than compensated for their higher volatility, compared to traditional bonds. Total returns increased 23 basis points, from 3.23% to 3.46%; volatility decreased 37 basis points, from 4.46% to 4.09%; Sharpe Ratio increased from 0.45 to 0.54.
- Adding a combination — 15% split between private and public debt — produced the second-highest risk-adjusted returns — higher than private debt alone, but lower than municipal bonds alone.
- Although additional infrastructure debt allocations would further improve the risk return profile, most investors would prefer to constrain allocations within reasonable limits.

Infrastructure debt improved returns with either less or only slightly higher risk, producing higher risk-adjusted returns when added individually and in combination.

Exhibit 5: Adding infrastructure debt to an investment grade global bond portfolio (2005 – 2017)

Comparing risk and return: global bond portfolio vs. adding 15% infrastructure debt



Sources: Bloomberg, FactSet, Nuveen, LLC. Calculations reflect annual returns for the 13-year period, 01 Jan 2005 – 31 Dec 2017. Asset classes are represented by the following indexes: infrastructure private debt proxy (Dow Jones Brookfield Global Infrastructure Corporate Bond BBB Index); infrastructure public debt (Bloomberg Barclays Municipal Revenue Bond Index); investment grade global bonds (Bloomberg Barclays Global Aggregate Bond Index). It is not possible to invest in an index. Performance for indexes does not reflect investment fees or transaction costs. Results may be significantly different for other time periods.

Scenario 3: Adding infrastructure equity and debt to a traditional 60%/40% portfolio of global stocks and bonds

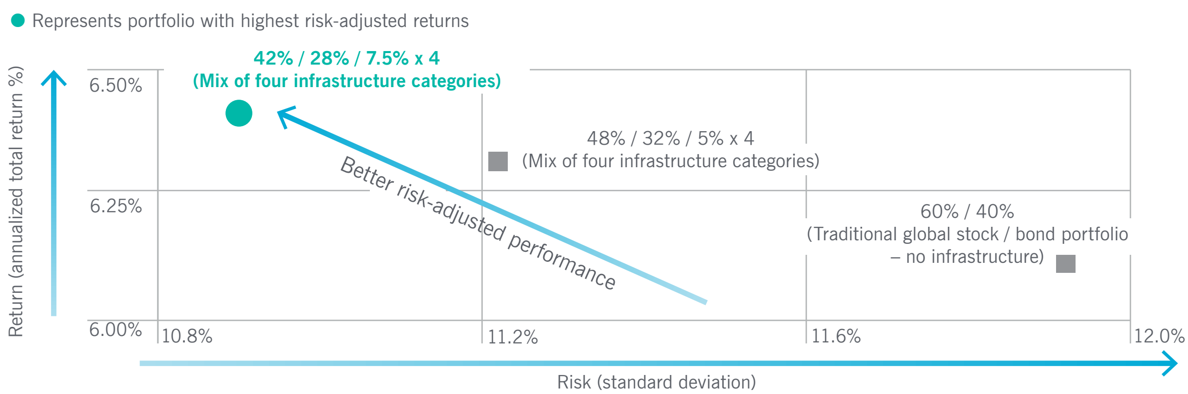
This analysis compared the risk-return profile of a portfolio containing all four infrastructure categories — 15% equity and 15% debt, evenly split between private and public — with a traditional 60%/40% portfolio of global stocks and bonds.

RESULTS

- Adding all four infrastructure categories improved returns and reduced risk, producing higher risk-adjusted returns.
- Returns increased by 31 basis points, from 6.10% to 6.41%; standard deviation dropped 102 basis points, from 11.92% to 10.90%; Sharpe Ratio increased from 0.41 to 0.48.
- Risk-adjusted returns improved with higher allocations to infrastructure equity and debt, but most investors would prefer constrained allocations.

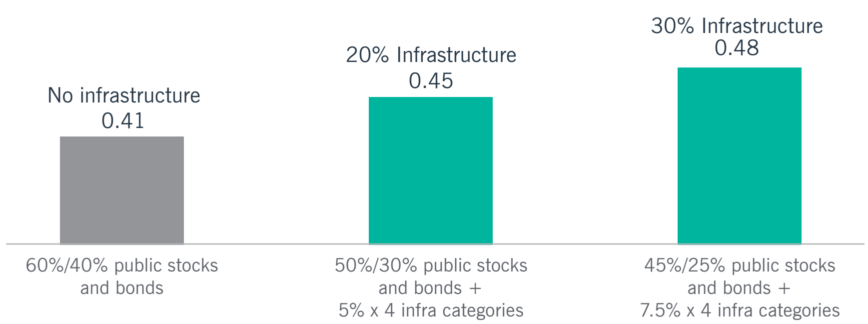
Exhibit 6: Adding four infrastructure categories to a 60%/40% global stock and bond portfolio (2005 – 2017)

Comparing risk and return: traditional portfolio vs. adding 20% and 30% infrastructure equity and debt



Sources: Cambridge Associates, Bloomberg, FactSet, Nuveen, LLC. Calculations reflect annual returns for the 13-year period, 01 Jan 2005 – 31 Dec 2017. Asset classes are represented by the following indexes: infrastructure private equity (Cambridge Associates index, based on net internal rate of return (IRR) to limited partners); infrastructure public equity (S&P Global Infrastructure Index); infrastructure private debt proxy (Dow Jones Brookfield Global Infrastructure Corporate Bond BBB Index); infrastructure public debt (Bloomberg Barclays Municipal Revenue Bond Index); investment grade global bonds (Bloomberg Barclays Global Aggregate Bond Index); global stocks (MSCI All Country World Investible Market Index); private real estate (NCREIF Property Index). It is not possible to invest in an index. Performance for indexes does not reflect investment fees or transaction costs. Results may be significantly different for other time periods.

Comparing Sharpe Ratios: Traditional portfolio vs. adding four infrastructure categories (equity and debt)



Sources: Cambridge Associates, Bloomberg, FactSet, Nuveen, LLC. See Exhibit 6 for list of indexes. Sharpe Ratio uses the return of the Bloomberg Barclays 3-Month T-Bill Index as a proxy for the risk-free rate. Performance for indexes does not reflect investment fees or transaction costs. Results may be significantly different for other time periods.

RISKS

The diversity of risk characteristics across the four infrastructure categories gives investors the opportunity to dial up or dial down exposures to match their desired risk-return profile. In many cases, risks represent tradeoffs for desired benefits. For example, the potential for higher returns often comes with higher volatility or lower liquidity. Fixed-rate debt may offer lower risk of loss, but with interest-rate risk. It's important to note that private equity and debt involve operational and regulatory risks requiring specialized management and legal expertise. The major risks for each infrastructure category are listed below:

Equity

- Private: illiquidity, operational, regulatory
- Public: volatility, market, security, regulatory

Debt

- Private: illiquidity, credit, duration, operational, regulatory
- Public: credit, duration, regulatory, market

Please note: Infrastructure-related investments involve sector risk and concentration risk, particularly greater exposure to adverse economic, regulatory, political, legal, liquidity and environmental risks.

MANAGER DUE DILIGENCE

Selecting managers with the right capabilities, experience, and track record is critical in a market where competition for assets is driving up prices and making it more difficult to access higher-value opportunities. The following attributes may increase chances for success:

- Coverage of all four infrastructure categories, providing more opportunity to diversify portfolios, assess relative value, and customize to a desired risk-return profile
- Specialized expertise in each category and across sectors, including project finance, contractual law, regulatory environments, risk management and technical skills such as engineering
- Access to proprietary deal flow, based on longstanding industry relationships, track record and reputation
- Dedicated teams to monitor investments that may span decades

CONCLUSION

Institutional investors should consider a dedicated allocation to infrastructure investments, based on the asset class's demonstrated potential to improve portfolio risk-adjusted returns. Relatively high and predictable income returns have provided additional diversification not available from other asset classes. Historical analysis using returns for the 13-year period, 2005 to 2017, showed that each infrastructure category improved risk-adjusted returns when added to traditional stock-bond portfolios. Infrastructure is not a monolithic asset class. Differences in characteristics can help investors achieve a desired risk-return profile by combining multiple categories of infrastructure equity or debt. Markets have responded with heavy demand that may compress future returns. Investors can improve their chances of accessing high-value opportunities by selecting managers with specialized expertise and longstanding industry relationships providing access to proprietary deal flow.

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Nuveen, the investment manager of TIAA, offers a comprehensive range of outcome-focused investment solutions designed to secure the long-term financial goals of institutional and individual investors. Nuveen has $973 billion in assets under management as of 30 Jun 2018 and operations in 16 countries. Its affiliates offer deep expertise across a comprehensive range of traditional and alternative investments through a wide array of vehicles and customized strategies.

For more information, contact your Global Investment Advisory Services representative, or visit us at nuveen.com/infrastructure

Endnotes

1 Global Infrastructure Outlook, Oxford Economics and Global Infrastructure Hub (G20), July 2017.

2 Beyond Budgets: The Real Solution to the Global Infrastructure Gap, Boston Consulting Group, November 2014.

3 Preqin Private Capital Fundraising Update, Q2 2018.

4 Preqin Infrastructure Fund Manager Outlook, H1 2018.

5 Ibid.

6 Moody's, Infrastructure Default and Recovery Rates, 1983-2016, July 2017.

7 Municipal bonds include securities that are either tax-exempt or taxable to U.S. individual investors. We refer simply to "municipal bonds" because their tax status is not relevant to institutions.

Risks and other important considerations

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Economic and market forecasts are subject to uncertainty and may change based on varying market conditions, political and economic developments. As an asset class, real assets are less developed, more illiquid, and less transparent compared to traditional asset classes. Investments will be subject to risks generally associated with the ownership of real estate-related assets and foreign investing, including changes in economic conditions, currency values, environmental risks, the cost of and ability to obtain insurance, and risks related to leasing of properties.

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