Private Infrastructure: Building blocks for customizing portfolio risk and return

Fall 2017

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Private infrastructure investments offer institutions greater flexibility in customizing portfolios to achieve a desired risk-return profile. Compared to public securities, benefits include the potential for higher yields and long-term growth, with lower risk than implied by the liquidity premium. Low correlations with public markets contribute to lower volatility. Strong governance provisions reduce the risk of less diversified and relatively illiquid private investments, and offer a level of control not available with public securities.

ASSET SELECTION AND GOVERNANCE SUPPORTING A BESPOKE RISK-RETURN PROFILE

PRIVATE EQUITY

Infrastructure private equity offers the opportunity to select assets and implement management controls matching a desired risk-return profile. Investors can choose assets with concentrated, “pure play” exposure to a specific industry sector, geography, and risk level. For example, they can choose lower-risk investments in established “core” companies, or higher-risk growth opportunities in restructuring or building new plants. In contrast, public equity investments tend to be diluted in corporations containing multiple holdings with differing risk-return characteristics. In addition, private equity general partners gain board seats providing control over deal structure and execution on

WHY INFRASTRUCTURE?

Infrastructure investments—public and private, equity and debt—offer the potential to increase portfolio risk-adjusted returns when combined with traditional stocks and bonds.

Consider:

- Investment opportunity is expanding with strong global demand for new infrastructure in emerging markets and for replacement in developed markets.
- Infrastructure is a separate asset class with strong diversification benefits because its assets are often regulated monopolies or quasi-monopolies providing essential public services.
- Infrastructure is less sensitive to economic cycles due to its higher, more stable income yield often guaranteed by long-term contracts.
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behalf of limited partners. To meet investors’ needs, general partners can determine the level of financial and legal liability, and preferences for income versus capital return, operating leverage, and project duration. General partners also gain early warning to address problems before they threaten bankruptcy.

PRIVATE DEBT

Infrastructure private debt characteristics can be customized by industry sector, capital structure, and covenants designed to reduce risk. At the top of the capital structure, senior secured loans are investment grade and offer reliable, long-term returns with lower yields (Exhibit 1). For example, they may be secured by public utility contracts for traditional power generation. Lower in the capital structure, holding company loans offers higher yields with lower credit ratings—for example, in renewable energy due to its more limited market.

<table>
<thead>
<tr>
<th>Corporate Capital Structure</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Secured Loans</td>
<td>Lowest risk, secured by corporate assets, floating rate, lower yield</td>
</tr>
<tr>
<td>Subordinated Debt (includes holding company loans)</td>
<td>Higher risk, unsecured, higher yield</td>
</tr>
<tr>
<td>Private Equity</td>
<td>Highest risk, unsecured, potential for yield and capital appreciation</td>
</tr>
</tbody>
</table>

Covenants make private debt attractive by reducing default rates below the level implied by private debt’s higher yield, compared to public debt. They include controls requiring the business to maintain specified yield payments and credit ratings, for example, by limiting its ability to take on additional debt. In case of default, loan holders can assume ownership of enforceable loan contracts.

Combining exposure to infrastructure equity and debt provides even more customization options. Using different parts of the balance sheet and capital structure, investors can tailor infrastructure investment characteristics—yield, growth potential, duration, volatility, downside risk, and J-curve exposure.

Limited Liquidity

With limited liquidity, private infrastructure investments tend to be suitable for large institutions with long investment horizons. Although secondary markets exist, entering and exiting private investments takes longer than public investments. These investments also require large capital commitments with lockups for up to 12 years. Private equity investors may not receive returns on their investments for several years due to potential J-curve effects.
PRIVATE EQUITY:
A RECORD OF HIGHER RETURNS, LOWER VOLATILITY, AND LOW CORRELATIONS

Infrastructure private equity’s diversification benefits stem from a historical record combining high returns, low volatility and low correlations, compared to public equity. With lower volatility, private equity produced risk-adjusted returns exceeding most categories of public equity. The reason: private equity is less exposed to public market volatility, which is more affected by macro events and other factors unrelated to fundamentals. For the 15-year period 2002-2016, private equity’s 8.58% returns exceeded U.S. and non-U.S. equity returns of 7.98% and 8.48%, respectively. Its risk-adjusted returns for this period were significantly higher, with a Sharpe Ratio of 0.65, compared to 0.37 and 0.32 for U.S. equity and non-U.S. equity, respectively (Exhibit 2). Diversification benefits were also evident with correlations of 0.61 and 0.64 with U.S. and non-U.S. equity, respectively, and -0.30 with investment-grade U.S. bonds (Exhibit 3).

PRIVATE DEBT:
EARNING A YIELD PREMIUM WITH LOW DEFAULT AND LOSS RATES

Infrastructure private debt has offered higher returns than public debt due to a yield premium compensating investors for its limited liquidity. For the 15-year period 2002-2016, private debt’s returns of 5.41% exceeded U.S. investment-grade bonds’ 4.22% returns by 119 basis points (Exhibit 2). Private debt’s volatility was higher, however, resulting in a lower Sharpe Ratio of 0.53, compared to 0.94 for public bonds. Higher volatility reflected lower credit ratings traditionally assigned to private debt, despite low default rates due to strict covenants. Private debt’s correlations were moderate with U.S. and non-U.S. equity, 0.56 and 0.71, respectively, and low with investment-grade U.S. bonds, 0.25.

Exhibit 2. Performance and risk measures for private infrastructure and public asset classes

| Annualized returns, standard deviation, and Sharpe Ratio (2002-2016) |
|-----------------------------|---------------------|---------------------|---------------------|---------------------|
|                            | Private Equity      | Private Debt        | U.S. Equity         | Non-U.S. Equity     | Investment Grade U.S. Bonds |
| Annualized returns         | 8.58%               | 5.41%               | 7.98%               | 8.48%               | 4.22%                      |
| Standard deviation         | 10.83%              | 7.31%               | 17.55%              | 21.91%              | 2.89%                      |
| Sharpe Ratio               | 0.65                | 0.53                | 0.37                | 0.32                | 0.94                       |

Data reflect performance for the following indexes for the 15-year period, 2002-2016. Infrastructure private equity: Cambridge Associates index of 86 infrastructure private equity funds covering vintage years 2002-2016, based on net internal rate of return (IRR) to limited partners; infrastructure private debt: two public indexes with equivalent credit ratings serve as proxies: Dow Jones Brookfield Global Infrastructure Corporate Bond BBB Index, 2004-2016, and S&P 500 BBB Investment Grade Corporate Bond Index, 2002-2003; U.S. equity: S&P 500 Index, non-U.S. equity: MSCI All Country World ex USA Index; investment-grade U.S. bonds: Bloomberg Barclays U.S. Aggregate Bond Index. It is not possible to invest in an index. Performance for indices does not reflect investment fees or transaction costs. Results may be significantly different for other time periods. Source: Bloomberg.
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Exhibit 3. Private infrastructure’s low correlations with public investments

<table>
<thead>
<tr>
<th>Infrastructure Indexes</th>
<th>Private Equity</th>
<th>Private Debt</th>
<th>U.S. Equity</th>
<th>Non-U.S. Equity</th>
<th>Investment Grade U.S. Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Equity</td>
<td>0.22</td>
<td>0.61</td>
<td>0.64</td>
<td>-0.30</td>
<td>-0.22</td>
</tr>
<tr>
<td>Private Debt</td>
<td></td>
<td>0.56</td>
<td>0.71</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>U.S. Equity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-U.S. Equity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.43</td>
</tr>
<tr>
<td>Investment-grade U.S. Bonds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.22</td>
</tr>
</tbody>
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STRONG MARKET DEMAND HIGHLIGHTS IMPORTANCE OF ACCESS TO DEAL FLOW

Gaining access to attractive private infrastructure investments has become more difficult with heavy demand from institutional investors searching for yield and total return. Preqin reported record global fundraising of $645 billion in 2016, with a record $137 billion in capital waiting to be invested at year-end. Increased competition for lower-risk “core” assets is raising prices and threatening to reduce future returns. Access to proprietary deal flow outside of public auctions has become more important for gaining better pricing, larger allocations, and more control over project governance. Investors can improve their chances of participating in private “club” deals—often led by fewer than 10 investors—by selecting managers with access to proprietary deals. In general, these managers have reputations for working well with general partners and project operators, long-standing industry relationships, and specialized legal and operational expertise required for private investment due diligence.

PRIVATE INFRASTRUCTURE INVESTMENT EXAMPLES

**Private Debt: Ohio State University**

Ohio State University issued $150 million of private loans under a 50-year, $1 billion project to outsource its power generating facilities. Proprietary debt financing supported construction of additional power capacity, including renewable energy. Senior secured and holding company loans were issued with yield premiums compared to similarly-rated public debt, and maturities ranging from 10 to 20 years.

**Private Equity: Catalina Solar**

EDF Renewable Energy—a global alternative energy producer—sold a $50 million private equity stake in a Southern California solar power project, among the largest in the U.S. generating 110 megawatts. An investment-grade public utility contracted to purchase 100% of power generated for 25 years, protecting stability of returns. The deal’s structure provided an above-market internal rate of return (IRR), including a current cash yield and opportunity for long-term capital appreciation. Energy production has exceeded preconstruction estimates by more than 6%.

Note these private debt and private equity investments are not funded through any investment product nor do they contribute to the performance of any investment product. The sole funding source for these investments are assets in the TIAA General Account. The TIAA General Account is an insurance company account and does not present an investment return, and is not available to investors.
Conclusion:

A dedicated allocation to private infrastructure equity, debt, or both—replacing part of the corresponding public asset class—offers the potential to increase yield and total return, while reducing volatility. These benefits can be particularly attractive to institutional investors seeking to better align assets and liabilities.

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

1. The J-curve represents the shape of private equity returns, which are generally negative for the first several years as capital is invested before the business produces a profit.

RISKS AND OTHER IMPORTANT CONSIDERATIONS

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