



Building Infrastructure into a Portfolio

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Editor's Note: For more information about infrastructure investing, see Justin Lannen, "Infrastructure: The International Investor's Road Ahead," Investments & Wealth Monitor (May/June 2008): 25–27.

Infrastructure investing is becoming a viable option for investors globally. This article addresses two important subjects that potential investors must consider. First, how does one diversify an infrastructure segment in a multi-asset class fund? Second, where does one put the diversified infrastructure segment once it is constructed? In some ways the answer to the second question is contingent upon how one answers the first.

Building a Well-diversified Infrastructure Segment

Infrastructure has a rich variety of fund structures, regions, stages, sectors, and investment horizons.¹ This plethora of options provides great potential for diversification in this asset class as well as opportunities to take targeted risk to enhance specific return goals. To make wise choices, investors should understand how to diversify and the risks associated with different options.

Because many funds are highly concentrated and illiquid, creating a portfolio of funds may be a better choice for many investors. Investors that can handle illiquid funds will be attracted to the increased ability to diversify along sectors and regions, while listed funds will offer some exposure to more mature assets. Achieving good diversification among private funds will be difficult for most investors without the benefit of a fund of funds. A private fund may have as few as eight underlying assets, so it

may be exposed to significant concentration risk. We anticipate funds of funds becoming more readily available in the next year or so.

Regional diversification. Infrastructure limited partnerships offer any choice of regional focus. Because they tend to be so concentrated, private funds are most likely to focus narrowly on a country or region. These funds are particularly attractive to regional investors. In particular, regional funds may offer an inflation linking that is more closely tied to the region, and thus better align return objectives with return expectations. Moreover, a regional focus may allow investors to feel that they are investing locally and enhancing their local economies. Finally, regional funds often are single currency and thus avoid currency risk for local investors.

On the flip side, a regional focus may increase some risks. If a California fund invested solely in California, a downturn in the California economy or a natural disaster in California could mean that the infrastructure does not meet expectations just when investors are most stressed. As well, political attitudes may shift over time. When the original investment is made, investors building a new road or improving an old one may be seen as heroes. Yet when tolls increase over time, heroes may become villains in the eyes of their neighbors. Some of this political backlash has been seen in Australia over airport fees and in the United States over water utilities.²

Ultimately, regional diversification is a net positive with currency as a noteworthy risk to consider and possibly address. Because cash flows are somewhat predictable, some degree of hedging is possible but could be expensive. However, risk has two sides

and currency risk can also be a tailwind. Increasing regional diversification to a global position may create an attractive balance of currency risks.

Sector diversification. Sector diversification is more easily attained with private funds. The broad listed infrastructure universe may have a large allocation to utilities and stocks that have some degree of infrastructure exposure but are not infrastructure *per se*. To get exposure to roads, ports, water and wastewater, and social infrastructure, private funds may be the only way to go. As well, developing infrastructure (also known as "greenfield") is unlikely to be offered as a listed product. Again, to gain good diversification, a fund of funds may be necessary for most investors.

Stage diversification. Infrastructure assets may be new or developing (greenfield) or enhanced (brownfield). Only mature infrastructure is available in listed securities, though some greenfield exposure can be had via investment in construction companies or suppliers. Limited partnerships are the only way, however, to get exposure to greenfield or brownfield directly. Certainly, greenfield projects introduce more risks, but they also should increase expected returns. Figure 1 illustrates some possibilities in the risk–return space. Indeed, the most mature, most predictable assets will behave more like bonds, while the pure developing projects should reward the investor with higher returns just as would be expected from private equity investing. The category that is uppermost right is greenfield emerging, which is development infrastructure in developing economies.

Manager diversification. While manager due diligence is an onerous



process, the benefits of selecting several managers rather than just one include fees, manager lifecycle, business risk, and asset diversification simultaneously. Unfortunately, most private funds have large minimum investments that make multiple-manager investment prohibitive for the solitary investor. Here again, we see a benefit to the fund of funds.

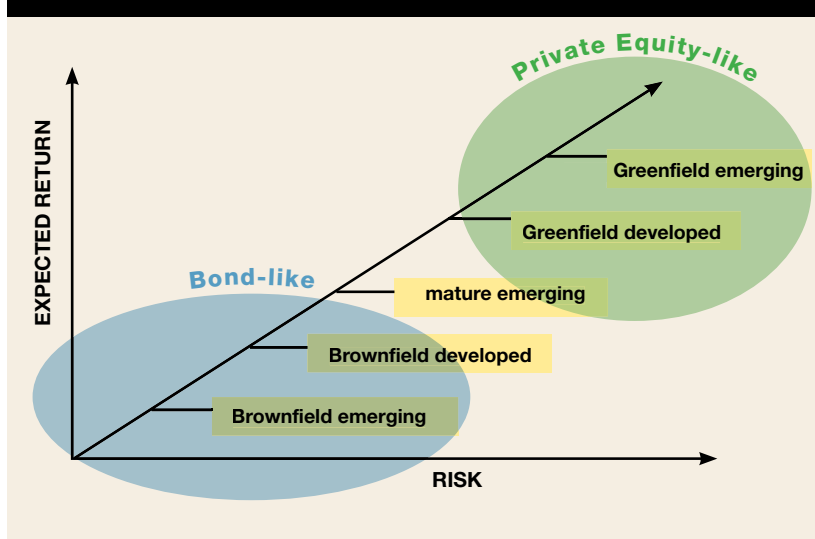
Ultimately, we see funds of funds as a natural fit for most investors save the very largest. A fund of funds will provide due diligence on managers, achieve multiple layers of diversification across several dimensions, and allow investors to gain access to infrastructure in a way that may not be possible on their own. Investors then would conduct due diligence only on the fund-of-funds provider.

Fitting Infrastructure into the Total Portfolio

Until we know enough about the return distribution of infrastructure to include it directly in an asset allocation model, investors likely will consider infrastructure a second-stage asset allocation decision. In doing so, several options are on the table. These options span from “liability matching” to “return seeking,” depending on the circumstances of the investor. To derive these options, we consider the return characteristics of infrastructure, including steady cash flows, long duration, uncorrelated returns, and inflation linking.

Steady cash flows. Investors may consider infrastructure an important yield-producing investment. In doing so, the investor should consider carefully the goal set forth by the infrastructure fund or manager. Higher yielding assets generally will be more mature; this implies lower internal rates of return (IRR) but an excellent complement to fixed-income-oriented portfolios. Greenfield funds are inappropriate for investors targeting yield, but they may be appropriate for return-seeking investors. Moreover, currency risk will be more of an issue for yield-seeking inves-

FIGURE 1: RANGE OF RISK AND RETURN EXPECTATIONS FOR DIFFERENT STAGES OF INFRASTRUCTURE



tors. While we still recommend regional diversification to improve the reliability of the yield, currency hedging might be more attractive for yield seekers.

Long duration. The long duration of infrastructure is most effectively realized through open-ended or long-term closed-ended private funds. If duration is important to the investor due to liabilities reaching far into the future, then funds emphasizing a buy-and-hold strategy, co-investment rights, and transfer rights at fund liquidation are most attractive. Listed funds and “flippers” focusing on exit strategy may be more appropriate for high return-seeking investors.

Diversification. Investors seeking diversification may want to bucket infrastructure with other real assets such as real estate and commodities. As well, along with other real assets, infrastructure may be considered part of a diversified alternatives mix. The investor favoring alternatives as a label should keep in mind the risk-return profile of infrastructure. Infrastructure is not likely to look like hedge funds or private equity that may offer spicier expected returns. The investor favoring either of these buckets will want to keep an eye on the liquidity of the portfolio as a whole.

Inflation linking. Inflation linking also bodes well for real-asset bucketing and long-duration liabilities that have an indexing component. Indeed, real assets are correlated not only with inflation but often are a contributor to inflation.

How much to do at the total portfolio level. Infrastructure most naturally falls into the alternatives allocation of the Russell Model Portfolio, alongside private equity and real estate. The model portfolio has a 20-percent suggested allocation to alternatives. Considering the newness of the asset class, the low levels of liquidity, and the concentrated nature of private funds, an allocation of 2 percent to 5 percent staged over two to three years seems an appropriate consideration at this time. More experience in this area coupled with a broader selection of products may warrant a revision upward in the future.

APPENDIX: DIVERSIFICATION DIMENSIONS Funds Structures

Direct. These generally are in the form of limited partnerships with similar legal and organization structures to private equity or private real estate funds and



may be open- or closed-ended. Because infrastructure assets may require massive amounts of investment capital, limited partnerships often will form consortia to pool the resources of several entities while preserving capital in their own funds to increase diversification.

While a well-known characteristic of infrastructure is long duration, these funds are most typically closed-ended with 10–12-year horizons. Open-ended structures do exist, but are less prevalent. A key advantage of the open-ended fund structure is the ability to benefit from the long duration of infrastructure assets and the resulting elimination of re-investment risk. Another advantage of an open-ended structure is the ability to observe the fund before making an investment.

Closed-ended structures have two key advantages: valuation and cash-flow certainty. Because returns for a closed-ended vehicle are calculated from “cash on cash” (i.e., cash received at fund close vs. cash committed at fund start), valuation is not questionable and returns are *ex post* realizations. In contrast, an open-ended vehicle will rely on valuations to determine returns. Valuations are best guesses and are subject to error.

An important feature of infrastructure is income. Income generally is thrown off from investments semi-annually for both open- and closed-ended limited partnerships. While infrastructure generates income, liquidity is very limited. Cash flows for closed-ended vehicles are neat and tidy—they liquidate at close. Funds received at intermediate points will be distributed as received and capital gains will be distributed when assets are liquidated via sale or initial public offering (IPO). Like closed-ended funds, liquidity for open-ended funds is very limited. A typical open-ended infrastructure fund will have an initial lock period, followed by a “best efforts” if an investor needs to have the investment returned. Specifically, when an investor

is ready to purchase one’s share in a limited partnership, liquidity is easy. In contrast, if no investor is available to purchase one’s share, liquidity may require an asset be sold (potentially at a heavy discount) or investors may have to wait.

As well, the number of shares in a closed-ended vehicle is fixed. Therefore, if a limited partnership must liquidate, it sells its shares privately and does not disrupt any other limited partnership’s status. Liquidation or new cash into an open-ended fund may not be so simple. Open-ended funds may take on new cash flows at any time (or at pre-specified times). The ownership of existing partners may be diluted as a result and tax implications may follow. Complex contractual arrangements may be required to avoid undesirable tax consequences for some limited partnerships.³

Even with these complications, firms are moving toward open-ended funds to meet investor demand. Once the challenges associated with valuations and cash flows are addressed, open-ended funds have some attractive features.

In addition to duration and long-term asset ownership, open-ended funds may come with lower fees and transaction costs, as well as with a general partner who has a longer-term view of how to manage an asset. Closed-ended funds require that assets eventually are sold. If you think selling a house has lots of costs attached, try selling an airport. Avoiding sales is a great way to protect capital. As well, an investment company signing up to buy an asset, improve it, and then sell (a classic real estate “flip”) has a much different view than one that will own and manage it for 30–80 years. Again, using the housing analogy, compare the quality of care given to a home by a flip-that-house type vs. a resident owner planning to live in it for 50 years.

Whether closed-ended or open-ended, direct funds offer an investor the steady long-term cash flows associated with infrastructure, potentially

increased input into the investment process and knowledge of the assets (relative to listed funds described below), possible co-investment rights, an illiquidity premium, and tremendous diversification potential. The drawbacks to consider are hefty fees, high entry-capital requirements, low liquidity, and general partner risk.

Individual securities. Listed infrastructure securities also provide exposure to infrastructure. The “pure infrastructure” securities often are infrastructure assets that have gone from private ownership to public, possibly through an IPO. For example, one may purchase shares in an airport or a road, for example, Copenhagen Airport.

Hybrid infrastructure securities have an infrastructure component along with other exposures. For example, construction companies that build infrastructure have an infrastructure component, though they are not infrastructure *per se* and will have a variety of other exposures as well. These companies also may be in the business of owning and operating infrastructure assets, for example, the Spanish toll-road companies Cintra and Autostrade.

These listed securities are compiled in indexes.⁴ The user of these indexes should note their breadth is a bit fuzzy and varies by index provider—spanning both pure and hybrid infrastructure securities. Because hybrids may introduce a plethora of other exposures, these indexes may not adequately describe the performance of infrastructure as an asset class. Moreover, listed infrastructure and some infrastructure indexes are dominated by utility stocks. Therefore, again, their ability to represent infrastructure as an asset class is suspect. Examples of indexes are the Macquarie and the S&P Global Infrastructure indexes.

Though investing in listed securities requires discretion to ensure a well-diversified infrastructure-only exposure, the liquidity is equal to listed stocks, the access does not require a large capital commitment, and they

may be accessed without the hefty fees of a limited partnership.

Listed funds. As in the case of listed stocks, listed infrastructure has a following of managers ready to build portfolios. The benefits of hiring a manager include screening stocks both for their exposures (or *not*, if that is preferred), stock selection, and diversification. Most importantly, a manager's skill in delivering these benefits should be verified. As well, the investor should be clear that the diversification and exposure is consistent with desires and expectations. Listed stocks may complement the direct funds by providing liquidity, potential upside from merger-and-acquisition activity from private fund managers, and investment flexibility in high demand market conditions.

What is right for me? In considering the choice between direct or listed funds, the investor must consider the following:

- * liquidity requirements
- * manager selection skills
- * level of diversification required
- * time horizon

Regions

The most mature markets for infrastructure are Australia, developed Europe, and Canada—the most mature market is Australia. Where private infrastructure investing is mature, investors have richer options with respect to the type of vehicle, such as private infrastructure funds, listed infrastructure funds, indexes of listed infrastructure, and the ability to hold individual infrastructure securities. Moreover, funds may be offered by investment banks, insurance companies, or specialist investors. Political risks likely are lower, as are the business risks associated with inexperienced investors, contractors, and operators. However, returns may be commensurately lower than in developing areas.

The United States is a developing infrastructure market within a politically and economically stable environ-

“ Where private infrastructure investing is mature, investors have richer options with respect to the type of vehicle . . . ”

ment with mature financial markets. The United States offers a fascinating combination of imminent privatization with institutions experienced in many aspects of infrastructure investing. U.S. investment banks have been evaluating infrastructure debt for many years, debt boutiques have experience in financing municipal projects, and investment banks and real estate firms may have non-U.S. operations with infrastructure fund experience. As such, business risk, while higher than in more-mature infrastructure markets, may be lower than in developing markets needing private infrastructure dollars. As governments unload infrastructure from their books, public reactions are uncertain—while the Chicago Skyway deal was hailed as the “deal of the century,” the purchase of municipal water facilities by the German RWE and the prospect of selling port operation rights to a Dubai investor has stirred nationalistic tendencies. The combination of lower risks in some areas but continued uncertainty in other areas suggests that expected returns on U.S. infrastructure investments still are higher than in mature markets.

Developing Europe and quickly emerging economies such as India and China are highly dependent on investment dollars to bring their infrastructure to levels that both enhance and sustain their growth potential.

Poor infrastructure is one important factor hindering economic growth in countries further down the development scale. Yet even in developed countries, aging infrastructure may inhibit growth and productivity. For example, in this era of just-in-time inventory,

corporations are likely to choose locations based on the quality of infrastructure to reduce delivery times.

Stages

Investment in infrastructure is available at any stage of development—greenfield, brownfield, mature.

Greenfield. The riskiest (and potentially most rewarding) stage is greenfield, where new infrastructure is being built to accommodate a perceived demand. Greenfield is most risky precisely because demand is undemonstrated. Moreover, while one can conduct studies to determine the desirability of a bridge, road, power distribution, waste water treatment, etc., knowing the fee the market will bear is difficult to determine with a high degree of certainty. As such, the risk–return profile of greenfield is similar to that of private equity investing (including construction, usage, and political risk) and a high degree of diversification is important. Fortunately, the growth of the global economy suggests that many greenfield projects in different regions and for different sectors (discussed below) will be available.

Brownfield. Brownfield is similar to greenfield in that development is a key element. However, brownfield implies the improvement or expansion of a going concern. In the case of brownfield, usage and fee tolerance may be more certain, yet construction risk still looms and expected returns must be structured to accommodate these risks.

Mature. Mature infrastructure has the lowest risk profile and, indeed, lower expected returns. Mature infrastructure is a fully developed going con-



cern with a known customer base and demand profile. Mature infrastructure can become brownfield given changes in population, economic activity, or state of repair. Risks of mature infrastructure include political risk, leverage, and natural disasters.

Sectors

Transport. Transport is the best-known semi-private infrastructure sector and includes toll roads, bridges, tunnels, airports, rail lines, subways, transit, pipeline, seaports, and ferry systems. The magnitude of initial outlay, the ability to restrict usage, and the necessity status of these assets renders them a natural choice for private financing combined with public regulation. Moreover, the history of revenue bonds associated with development of transportation systems has given private markets many years of experience in valuing these assets and understanding future cash flows.

Power transmission and distribution. Electricity generation is a highly competitive commodity-centric business, but transmission and distribution of electricity is infrastructure. Historically, generation, transmission, and distribution were bundled as a single service. As the industry and government regulation have evolved, generation has begun decoupling from transmission and distribution. This is leading to more investment opportunities in the transmission and distribution business.

Telecommunications. As in the case of power transmission and distribution, the concrete and steel of communication is infrastructure. Such assets include phone wires, cellular towers, and broadcast relay stations. Also, telecommunications has highly competitive commodity-like components such as generation of content and connectivity.

Water provision and wastewater processing. The Thames Water Project sale of late has thrust water provision into the limelight.⁵ Water provision is


a touchy subject politically. While it is possible that economies of scale exist and may be exploited by private corporations serving multiple communities, many—particularly in the United States—feel that water provision is a basic right and have taken issue with its privatization.⁶

To the contrary, wastewater processing has not been so controversial. Treating both sewer water and industrial wastewater is specialized work that benefits from economies of scale in management and operation. Imagine two small factories in the same area producing water in need of treatment. Clean-water requirements easily could stipulate that both factories carry staff to see to the processing and ensure that government regulations are met. Outsourcing to a private infrastructure firm would eliminate this redundancy.

Social Infrastructure. Outside the United States, social infrastructure may be provided through private financing initiatives (PFIs) or private public partnerships (PPPs). Such arrangements open up the building and operation of schools, prisons, medical facilities, security, and other government services to private investors. Such investments may differ from typical infrastructure in that the fee is contractually arranged between the investor and the government, removing demand risk from the equation. In these cases, the primary risks are construction, operational, and resale.

Investment Horizons

Infrastructure investing offers at least three investment horizons. The most appropriate horizon for the nature of an infrastructure asset is the long term. While not yet the norm, open-ended limited partnerships are available from some firms and offer the opportunity to enjoy the long duration these assets may exhibit. As in the case of real estate limited partnerships, we expect open-ended funds to become more typical in the future. Closed-end funds range in term from 10–20 years—and are also

long-term investments. Listed funds offer high levels of liquidity (even daily) and allow for rebalancing and shorter investment horizons for those less concerned with inflation linking. 

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Endnotes

- ¹ For details on each of these dimensions and their characteristics, see the appendix.
- ² For Australian airport fee issues see <http://www.smh.com.au/news/Business/Corrigan-slams-airport-pricing/2005/05/19/1116361677668.html>; for U.S. water issues, see Mike Esterl, “Great Expectations for Private Water Fail to Pan Out,” *Wall Street Journal* (June 26, 2006).
- ³ Investors in limited partnerships should consult a tax advisor.
- ⁴ For example, the Macquarie suite of indexes at http://www.ftse.com/Indices/Macquarie_Global_Infrastructure_Index_Series/index.jsp; or the UBS suite at http://www.ubs.com/1/e/media_overview/media_asia-pacific/mediareleases?newsId=82705.
- ⁵ See Andrew Hill, “A Thirst for the Most Vital Liquid Asset,” *Financial Times* (August 7, 2006).
- ⁶ See Mike Esterl, “Great Expectations for Private Water Fail to Pan Out,” *Wall Street Journal* (June 26, 2006).

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