# Infrastructure investment for insurance companies under Solvency II

September 2013

The draft proposal for Solvency II paints infrastructure investing with an overly broad brush and misses an opportunity to distinguish between the diverse styles of infrastructure investing that carry very different expected risk-return profiles. The simplistic approach to the entire infrastructure sector under the draft proposal makes it more difficult for European insurers to access the stable and relatively predictable long term cash flows provided by infrastructure assets at the lower end of the risk spectrum.

## INFRASTRUCTURE: DIVERSE OPPORTUNITY SET

Infrastructure is a large asset class that can offer a broad range of risk-return profiles for insurance companies.

While mature infrastructure assets represent a relatively safe subset of the asset class, investments in development projects, for example, can expose investors to higher levels of risk, including revenue risk, construction risk and political risk. As such, any potential investor should fully assess the risk factors associated with an infrastructure investment including the phase of the development, political and regulatory environment, and long-term demographics of the service area.

There are also a number of ways that investors can gain exposure to infrastructure projects, including direct investments, listed infrastructure sector equities or investments in infrastructure investment funds.

Recently, long-dated project finance debt has offered an alternative means of investment in infrastructure. Traditionally retained on the balance sheets of the originating banks, the elevated capital requirements for these assets under Basel III have prompted many banks to offer these assets within the secondary market at substantial discounts and attractive yields.

Where the risk profile is fully understood and deemed acceptable, the combination of relatively stable long-term, inflation-protected cash flows and attractive spreads may mean such long-dated project finance debt provides a good match for certain insurance liabilities.

While studies looking at the cash flows from infrastructure investments have highlighted lower cash flow and spread volatility than other equity and bond investments, the current draft proposal for Solvency II does not recognize these differences in the standard capital requirements calculation. If the draft proposal stands, Solvency II may present a significant barrier against investments in “core” infrastructure by European insurers.

## INFRASTRUCTURE: ESSENTIAL ASSETS

Infrastructure provides services that are essential to a well-functioning economy. The asset class ranges from economic infrastructure, which permits circulation of goods and commodities including water, energy, people and information, to social infrastructure, such as hospitals and schools. Infrastructure assets are generally financed by end users, taxpayers or both. With very high capital costs compared to marginal costs, they are typically natural monopolies and face no direct competition. As monopolies, privately-held infrastructure assets are regulated either directly or through concession agreements that set capital, maintenance, and operational service standards and price levels.

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### The wide spectrum of expected risk and return

Infrastructure assets offer a wide spectrum of risk and expected return profiles. Key drivers of risk and return include the sector of the infrastructure project, the geographical location and the stage of development (or maturity) of the project.

The maturity of an infrastructure asset is one of the main determinants of its investment risk, total return and yield.

Newer, or *greenfield* assets, are those in the phase that spans the initial stages of infrastructure creation from the design and the securing of public authorisations to the construction of the project itself. By their nature, greenfield infrastructure assets tend to bring a relatively high level of risk. This can result from exposure to uncertain revenue profiles, political risks, initial construction work and other factors such as environmental obstacles, which can cause further delay or even lead to cancelation. There is also significant risk in the accuracy of usage predictions for to-be-built infrastructure assets. *Brownfield* assets, on the other hand, are already constructed and have a history of operation providing good visibility into revenue, usage rates and operating and maintenance costs.

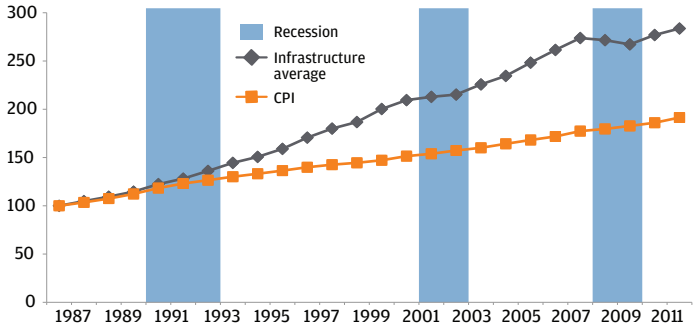
Furthermore, experience has shown that usage of the services that infrastructure assets provide tends to grow over time. Due to population and real income increases, utilities gradually add new households to their networks and transportation assets experience robust long-term growth trends. As such, mature infrastructure assets can offer relatively stable income, growth and capital appreciation.

If stable operating incomes are underwritten in a prudent manner, brownfield infrastructure assets can produce high yields and risk-adjusted returns. Exhibit 2, which focuses on mature infrastructure assets in the Organisation for Economic Co-operation and Development ("OECD"), demonstrates two points:

1. On average, mature infrastructure cash flows have mostly continued to grow, even during recessionary periods, over the past 25 years; and
2. Average cash flows for mature infrastructure assets rose in real terms as such, the asset class offers a high and increasing free cash flow-to-equity.

### Exhibit 2: Growing and resilient OECD infrastructure cash flows

Indices of annual cash flows for US and EU-15 infrastructure against average high income OECD CPI, 1986 - 2011




EU-15 refers to the members of the European Union prior to the accession in May 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

Source: J.P. Morgan Asset Management GRA Research as of September 30, 2012

### Exhibit 1: Infrastructure risk-return characteristics by maturity and sector

"Brownfield": Existing, Mature Assets — "Greenfield": Development Projects

Core-plus infrastructure

| Core | Value-Added | Opportunistic |
|---|---|---|
| Bridges, tunnels, toll roads | Airports, seaports | Non-OECD country infrastructure |
| Pipelines, energy transmission and distribution | Rail links | Satellite networks |
| | Contracted power generation | Merchant power generation |
| Water and waste-water systems | Rapid rail transit | Development projects |

Less risk
Less return

More risk
More return

Cash flow - driven returns

Capital gains - driven returns

The risk-return profiles of infrastructure assets also differ by geographies and jurisdictions. In general, emerging markets have a higher proportion of greenfield projects, as these markets require more new construction, while most OECD countries require more investment in maintenance, refurbishment and expansion.

While investments in infrastructure outside the OECD may offer higher returns, these are generally considered more risky, for two principal reasons:

1. The legal, regulatory and political environment poses a higher degree of uncertainty in dealing with the local authorities than in OECD countries.
2. Greater difficulty in forecasting demand than in OECD countries, because of surging economic and population growth in emerging economies.

Nevertheless, certain factors may offset some of the heightened risk in emerging countries. In Asia, many infrastructure investment opportunities involve greenfield programmes whose average size is smaller than those of their OECD counterparts. This in turn may give the Asian ventures access to more diversified investment portfolios and help to limit specific risks.

### Example – differing risk profiles between geographical markets

The cash flows resulting from a water project serving an average-size German town would not be expected to exhibit huge fluctuations as demand would be expected to be relatively stable; the municipal population, the size of the typical home and the habits of consumers are all fairly stable and thus usage is relatively easy to estimate.

By contrast, a water project serving an Indian or a Chinese city would face far more uncertainty, particularly with regard to population growth rates, affordability and utilisation, and therefore revenue levels.

Infrastructure has great heterogeneity even within these classifications. Depending on the sector, the country, the contractual framework and the maturity of the asset, the level of risk and expected return can differ in the following ways:

- Some infrastructure assets more closely represent bonds, as they generate a relatively secure recurring revenue stream over a set period (the term of the contract). Their very low risk is matched by a correspondingly modest return. This format is characteristic of social infrastructure assets leased by a creditworthy public authority.
- Mature transportation infrastructure assets in OECD countries carry a risk of greater degree of economic sensitivity and diminished traffic volume in areas of low demographic growth. However, their location can minimise risks of a regulatory or political nature. This category includes highways, rail networks, seaports and airports.
- Greenfield assets exhibit higher risk but also greater expected revenue growth over time. Local economic parameters are major factors in assessing greenfield risk.
- The most risky of all infrastructure assets are those that operate in a purely competitive context, in other words, without a monopoly market position and without a long-term contract. An example would be a power plant in an emerging country that sells all of its production and purchases its fuel on the spot market.

## WAYS TO INVEST IN INFRASTRUCTURE

There are a number of ways in which institutional investors can include infrastructure in a portfolio, including:

- Investing directly in an infrastructure asset, alone or as a co-investor with other institutional investors, industrial or financial partners or professionally managed investment funds.
- Investing in a portfolio of unlisted assets through professionally managed investment funds.
- Investing through unlisted infrastructure companies or private infrastructure investment funds.
- Investing through listed infrastructure companies owning a portfolio of assets.
- Investing through the purchase of listed infrastructure sector equities, directly or by means of pooled investment funds.

Of the above options, direct investing is the least commonplace and the most complex way of accessing infrastructure. This requires significant effort on the part of the investor and a dedicated team of experts and experienced investment professionals to seek out the infrastructure projects or assets, conduct due diligence and analyse risks and potential returns, negotiate their acquisition, participate in their financing and, if necessary, in their construction, and then engage in on-going asset management activities.

Given the size of the assets, single direct investments often involve hundreds of millions of euros and are typically only executed by large-scale investors. An investor must have a portfolio allocation large enough to achieve meaningful diversification. To diversify their allocation, many direct investors acquire an infrastructure asset by participating in a consortium. Some large investors may opt to co-invest in a single asset, alongside a professionally managed investment fund in which the investor has already invested. This provides a way for the investor to access an asset without having to field as large an internal team.

Gaining exposure via unlisted investment funds is the option most commonly pursued by medium and large institutional investors. These funds are managed by dedicated teams within investment management companies on behalf of long-term investors. One significant benefit of unlisted infrastructure funds is the ability to customise strategy. For example, an investor might favour a fund of mature assets with a history of on-going cash flows, a fund of development assets with greater risk but higher expected potential return, or both.

Unlisted infrastructure funds of funds, though few in number, appeal to investors unable to access certain private infrastructure funds directly because of the size of minimum initial investment requirements. Funds of funds also offer diversification among infrastructure managers and strategies as well as providing added value through monitoring and reporting on positions in the portfolio. In return, funds of funds collect additional fees from their investors.

Buying shares of Infrastructure companies or funds permits exposure to the sector through the stock market. However, this method does not necessarily provide well diversified exposure, as these companies and funds are often either insufficiently diversified across the infrastructure opportunity set or are diversified beyond infrastructure. Investing in publicly traded infrastructure securities also generates returns that are highly correlated to general equity indices, particularly during periods of economic and financial distress (such as 2008 and 2009), precisely the time when investors are looking for the diversification benefits of uncorrelated returns.

### Liquidity considerations

Further consideration should be given by investors to the required liquidity of any infrastructure investment.

As a result of the unique nature of infrastructure assets and the size of the required stake, direct investments may give rise to relatively illiquid assets. In certain cases, regulatory approval may be required for the transfer of the asset to new owners, further reducing the level of liquidity.

For the investor who opted for an unlisted fund, withdrawal opportunities differ by the structure of the vehicle. Open-ended unlisted funds may offer semi-annual or quarterly withdrawal opportunities. With closed-ended unlisted funds, liquidity is non-existent before the fund's expiration date, although a sale in the secondary market may provide an exit opportunity but typically at a discount to underlying net asset value.

Long-term direct investors in infrastructure assets as well as investors in infrastructure funds enjoy an illiquidity premium compared with investors in readily tradable listed infrastructure shares.

### The bond approach: Project finance debt and a newly emerged opportunity

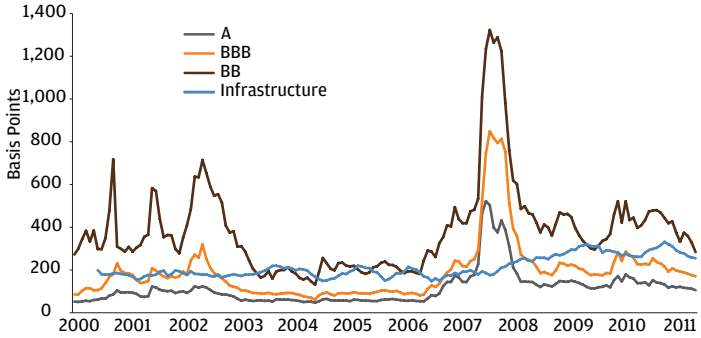
Project finance debt offers an alternative method of investing in infrastructure via high quality, long-term, fully amortising, floating-rate assets that are senior and secured by infrastructure assets.

Normally, such senior infrastructure loans are originated by banks' project finance departments and have been kept on the banks' books for their 20-to-30 year lives. The secondary market for these loans has historically been almost non-existent. However, in today's economic environment, undercapitalised bank balance sheets and increasingly stringent capital requirements for long-dated infrastructure loans under Basel III have created an opportunity for fixed-income investors to purchase these loans at substantial discounts and attractive yields.

As shown in Exhibits 3 and 4, because of their historically low default rates and high recovery rates, the average five-year cumulative credit loss rate for infrastructure loans is estimated to be close to A-rated corporate bonds, while these loans are currently issued at approximately 200 to 300 basis points over LIBOR margins, comparable to BBB-rated corporate bonds. Depending on the interest rate environment, swapping a 25-year loan priced at LIBOR plus 300 basis points may generate fixed interest rates between 5.50% and 6.50% on a senior secured loan with an average duration of about 12-15 years.

### Exhibit 3: Steady and attractive spreads over LIBOR

Margins over LIBOR for long term (7+ years) global corporate bonds and new issue infrastructure project finance debt




Sources: Barclays Capital; J.P. Morgan Asset Management estimate as of June 2013

## INFRASTRUCTURE INVESTMENT AS AN ASSET CLASS FOR INSURERS

The relatively stable long-term cash flows and attractive spreads may provide insurers with a good match for the stable long-term liability cash flows that emerge from annuity-style products.

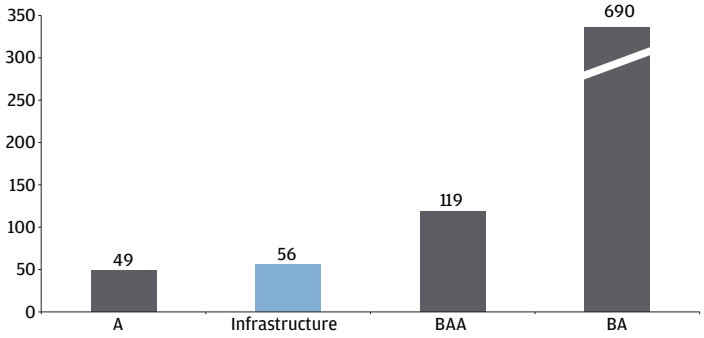
While investment in this area by insurers has been cautious to date, the proposed Solvency II regime removes the quantitative restrictions on investment in specific asset classes replacing these with the need for insurers to invest in accordance with the prudent person principle. As a result, increasing numbers of insurers are seeking out infrastructure assets as an investment opportunity with a number of large annuity providers recently announcing that they intend to increase their exposures to infrastructure going forward.

However, as such investments are generally unlisted, an investor, making a portfolio allocation decision, will not be able to compare and rank infrastructure assets against other investment alternatives simply by looking at its historical rates of return and volatility, since such long-term rate-of-return data do not exist.

An alternative approach to assessing infrastructure assets is to take a bottom-up approach, determining the rate of growth of cash flows (or cashflow proxies) by looking at annual operating incomes and costs over long periods of time. This approach allows historical cash flow performance of infrastructure assets to be compared with the cashflow performance of other asset classes.

**Exhibit 4: Average five-year credit loss rates for infrastructure debt approach the level of A-rated corporate bonds**

Average 5-year cumulative credit loss rates for global corporate bonds and new issue infrastructure project finance debt




Sources: Moody's and J.P. Morgan Asset Management. Based on average cumulative default rates and recovery rates between 1982 and 2010 as reported by Moody's in Special Report, Corporate Default and Recovery Rates, 1920-2010, Feb 28, 2011. The above chart is shown for illustrative purposes only. Past outcomes are not indicative of future outcomes.

## INFRASTUCTURE UNDER SOLVENCY II

Under current draft Solvency II requirements, the capital requirements in respect of both infrastructure debt and equity are captured under the market risk sub-module of the standard formula.

Due to its characteristics, infrastructure equity would generally be considered as "type 2 equity" under the standard formula and, as such, capital requirements are calculated under a 49% fall in market values (plus or minus any symmetric adjustment).

The capital requirements for infrastructure debt are captured under the spread risk sub-module, irrespective of whether the debt is held in the form of bonds or where insurers are providing investment through long-term loans. Under this, the capital requirements are calculated in relation to the duration and credit rating of the instrument.

Where the infrastructure debt is unrated, the spread risk charge to be applied falls between that for A and BBB rated bonds and loans.

### EIOPA Discussion paper on Standard Formula Design and Calibration for Certain Long-Term Investments

On 8 April 2013, the European Insurance and Occupational Pensions Authority (EIOPA) published a discussion paper on Standard Formula Design and Calibration for Certain Long-Term Investments.

The discussion paper sets out EIOPA's findings from an in-depth analysis on whether the calibration and design of the regulatory capital requirements for certain long-term investments held by insurers under the envisaged Solvency II regime (as calculated using the standard formula) should be adjusted or reduced under the current economic conditions, without jeopardising the prudential nature of the regime. This analysis covers the following asset classes:

- Private Equity/Venture Capital
- Socially Responsible Investments ("SRI") and social business debt and equity finance
- Infrastructure project debt and equity
- Securitisations of SME debt.

Throughout the paper, EIOPA has highlighted the need to ensure that the standard formula provides an appropriate trade-off between "risk-sensitivity and simplicity" which would need to be considered before introducing more granular treatment of particular asset classes.

EIOPA has highlighted the challenges of performing calibrations for infrastructure equity, which is generally unlisted, and debt, which generally takes the form of loans and as such has no market prices available.

EIOPA concludes that it has found no evidence that "*the spread risk for infrastructure project debt…differs significantly from the spread risk of corporate debt with the same rating*".

Studies looking at historical cash flow performance of infrastructure assets within the banking sector and comparing

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these with the cash flow performance of other asset classes* have highlighted a number of interesting findings, including:

- The volatility of infrastructure cash flows is materially lower than those of equities and property;
- Infrastructure cash flows are not highly correlated to those of equities and property;
- The cash flows of infrastructure assets grow faster than the CPI over time (see Exhibit 2); and
- Diversification opportunities exist within the infrastructure asset class itself.

* J.P. Morgan Asset Management - Global Real Assets: *Infrastructure Investing - A portfolio diversifier with stable cash flows* (2012)

Furthermore, while the cumulative credit losses for infrastructure debt approximate those seen for A-rated corporate bonds, Exhibit 3 illustrates that the spreads on infrastructure bonds have been sustained at long-term average levels comparable with BBB-rated corporate bonds but with significantly lower volatility than exhibited for corporate bonds.

As such, EIOPA's proposed calibrations may materially overestimate the capital requirements for insurers looking to hold these assets. The use of an internal model to calculate Solvency II capital requirements allows firms to adopt a more granular treatment than set out in the current draft of the Solvency II standard formula. As such, standard formula firms looking to hold relatively significant levels of investment in infrastructure may consider moving to an internal model approach in order to more accurately reflect the risks inherent in this asset class.

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