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◆ **BACKGROUND**

The U.S., like most developed countries,<sup>1</sup> has an aging infrastructure at various levels of disrepair needing to be replaced or upgraded. Following the definitions of the American Society of Civil Engineers (ASCE) and the Organisation of Economic Co-operation and Development (OECD), “infrastructure” refers to the system of public works in a country or state including roads, transit, ports, water and energy distribution, and transmission lines. An additional type of infrastructure is “social infrastructure,” which typically includes health care facilities, school buildings and waste-management facilities.

In its 2017 infrastructure report, the ASCE graded the nation’s infrastructure with a D+, meaning it is in poor condition and mostly below standard with high risk of failure, as it is approaching the end of its service life.<sup>2</sup> The 2017 grades range across all 16 infrastructure categories, from B for rail to D- for transit. While the cumulative grade remained unchanged from 2013, three categories received a lower grade this year, while seven saw slight improvements.<sup>3</sup>

If nothing else, the poor grade illustrates the urgent need for investment in the nation’s infrastructure. According to the ASCE, in order to meet future needs and restore the country’s global competitive advantage, the estimated \$2.1 trillion 10-year investment gap must be closed. Thus, just to cover existing needs based on current trends, investment from the public and private sectors must increase from 2.5% to 3.5% of U.S. gross domestic product (GDP) by 2025.<sup>4</sup> This estimate may even be on the conservative side, because it does not fully account for all the future infrastructure needs to serve a growing population and accommodate emerging technologies.

Lack of available and sufficient public funding for infrastructure due to fiscal tightening has presented an opportunity for institutional investors with a long-term horizon such as life insurance companies, pension funds, mutual funds, endowments and foundations, which may be uniquely positioned to provide capital for infrastructure projects. In May 2017, the federal Building and Renewing Infrastructure for Development and Growth in Employment (BRIDGE) Act was introduced in the U.S. Senate to establish a national infrastructure bank to help state and local governments to better leverage private investor capital to mend and improve the nation’s infrastructure.<sup>5</sup>

The presumed suitability of infrastructure investment for life insurance companies has further enhanced infrastructure’s

standing as an attractive asset class with hybrid characteristics of equity, debt and real estate.<sup>6</sup> Furthermore, investments offering better-than-average yields are appealing in the current macroeconomic environment characterized by persistent low interest rates. A long duration, higher return investment asset providing steady income stream with moderate volatility would naturally appeal to most life insurance companies. Also, being considered generally uncorrelated with the macro environment makes infrastructure investment seem almost ideal for their investment portfolios.

In May 2016, the U.S. Bipartisan Policy Center issued a report on infrastructure investment, suggesting default rates on infrastructure bonds were generally lower than on corporate bonds, and recommended state insurance regulators consider their performance history in setting capital-related requirements.<sup>7</sup>

However, although infrastructure investment may be able to provide several benefits to investors, it also has a variety of complex and idiosyncratic risks. A detailed and deep understanding of infrastructure financing and contractual structure, as well as knowledge of sophisticated analytical approaches, are needed to fully assess the risk-return profile of each specific infrastructure project.

Furthermore, infrastructure investment is heterogeneous, with many different types which do not always have the same characteristics, making a unique classification challenging for investors as well as regulators. To the extent this is an investment the U.S. insurance industry has less experience with, more granular and detailed reporting of the type and level of activity allowing for more regulatory oversight may be warranted.

Aside from the analytical challenges infrastructure investment may present for valuation and risk assessment, a key question for state insurance regulators is whether the current regulatory framework impedes, in any way, life insurers’ abil-

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<sup>1</sup> Most developed countries are members of the OECD whose origins date back to 1960, when 18 European countries, the U.S. and Canada joined forces to create an organization dedicated to economic development. Today, 35 member countries span the globe, from North and South America to Europe and Asia-Pacific, and include many of the world’s most economically advanced countries but also some emerging economies.

<sup>2</sup> [www.infrastructurereportcard.org](http://www.infrastructurereportcard.org).

<sup>3</sup> [www.infrastructurereportcard.org](http://www.infrastructurereportcard.org).

<sup>4</sup> [www.infrastructurereportcard.org](http://www.infrastructurereportcard.org).

<sup>5</sup> [www.congress.gov/bill/115th-congress/senate-bill/1168](http://www.congress.gov/bill/115th-congress/senate-bill/1168).

<sup>6</sup> Weber, B., Staub-Bisang, M. and Alfen, H.W. 2016. “Infrastructure as an Asset Class: Investment Strategy, Sustainability, Project Finance and PPP.” John Wiley & Sons Ltd.

<sup>7</sup> Bipartisan Policy Center. 2016. “Bridging the Gap Together: A New Model to Modernize U.S. Infrastructure” May 2016.

ity to invest in infrastructure and what changes are actually needed, if any. As prudent asset-liability management is a regulatory priority, evaluating the suitability of infrastructure investment for insurance companies cannot compromise the core regulatory mission to preserve the solvency of regulated companies and protect policyholders.

Former NAIC President and Missouri Insurance Director John M. Huff, in his introductory remarks during the Valuation of Securities (E) Task Force special session on infrastructure investment at the 2016 Summer National Meeting, stressed it is critical for regulators, as they consider possible changes in the regulatory regime, to not encourage or incentivize insurance companies to do anything that does not make any sense from an investment perspective or it is not financially prudent.

Insurance companies already have a significant presence in infrastructure financing through their existing bond investments. Insurance companies held approximately \$223 billion in U.S. Treasuries, \$198 billion in general obligation bonds, \$296 billion in municipal revenue bonds and \$780 billion in corporate bonds in infrastructure sectors like utilities, communications, transit, natural resources, power generation and social infrastructure.<sup>8</sup>

### ◆ INFRASTRUCTURE AS AN ASSET CLASS

Given infrastructure's essential role in the economy and for its future growth, the provision of stable and adequate financing to close the infrastructure funding gap could be seen as a societal priority. The ostensible need to enhance private market solutions to better leverage existing capital of institutional investors raises the issue of infrastructure as an asset class.

An asset class is defined as "a set of assets bearing some fundamental economic similarities to each other, and have characteristics making them distinct from other assets that are not part of that class."<sup>9</sup> Therefore, to classify infrastructure investments as an asset class, they must share same risk-return characteristics, behave similarly in the market with returns highly correlated with each other. Also, their price and composition data should be readily available and should be possible to invest in the asset class passively, at the quoted prices.<sup>10</sup>

The absence of those characteristics, combined with the lack of available knowledge on how to benchmark infrastructure, could create additional uncertainty among institutional investors such as life insurance companies tempering their appetite for investing in infrastructure. It would also add to the complexities of classifying, valuing and

providing regulatory guidance as to the treatment of these types of investments by state insurance regulators.

Life insurance companies historically have indirectly invested in infrastructure through corporate bonds of infrastructure-related companies or tax-exempt U.S. municipal revenue bonds. However, bonds more directly earmarked to an infrastructure project or public-private partnership deals may present a number of challenges for investors and regulators alike. Moreover, the issue of direct investments in infrastructure as a relatively untapped sector for investments addressed in this part of the article is further accentuated when we include structures and investment vehicles such as private equity/venture capital, real estate or other alternative investment funds, fund of funds and direct investments or bespoke co-financing structures.

A study by C. Rothballe and C. Kaserer noted the low systematic risk and high idiosyncratic risk of infrastructure investment and argued infrastructure investments are exposed to atypical risk profiles due to construction risk, high operating leverage, low market competition and high levels of asset specificity.<sup>11</sup>

According to Deutsche Bank and Blackrock reports, investors would need to examine each infrastructure investment by infrastructure subsector (e.g., transit, ports, roads, etc.) and stage of development to assess its individual risk-return profile.<sup>12</sup> Infrastructure investments from different subsectors tend to have distinct risk-return profiles, making a narrower analytical approach more meaningful than treating all infrastructure investment as one separate and homogeneous asset class.<sup>13</sup> A number of studies have found significant variance in returns across subsectors within the infrastructure investment space.<sup>14</sup>

During the lifecycle of an infrastructure project, there may be a few different risk-return profiles that may significantly impact its appeal and suitability as an investment for life insurance companies. Infrastructure projects generally go

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<sup>8</sup> NAIC 2015 Annual Financial Statements.

<sup>9</sup> Greer, R. J. 1997. "What is an Asset Class, Anyway?" *Journal of Portfolio Management* 23(2), 86-91.

<sup>10</sup> Oberhofer, G. 2001. "Hedge funds – A new asset class or just a change in perspective," *Alternative Investment Management Association Newsletter*, December 2001.

<sup>11</sup> Rothballe, C. and Kaserer, C. 2012. "The risk profile of infrastructure investments: Challenging conventional wisdom." *Journal of Structured Finance*, 18(2), 95-109.

<sup>12</sup> Deutsche Bank. 2014. "European infrastructure update" Technical Report, Blackrock. 2015 "Infrastructure Rising: An Asset Class Takes Shape." April 2015.

<sup>13</sup> Thierie, W. and De Moor, L. 2016. "The characteristics of Infrastructure as an Investment Class." Swiss Society for Financial Market Research, July 2016.

<sup>14</sup> Thierie, W. and De Moor, L. 2016. "The characteristics of Infrastructure as an Investment Class." Swiss Society for Financial Market Research, July 2016.

through four distinct phases—planning, construction, operation and winding-up—with each phase requiring specific risk considerations.<sup>15</sup> An understanding of how expected returns would evolve over a project’s lifecycle and the specific phase at any particular time, as well as the associated risk profile, would fundamentally change investors’ decisions. Accurately assessing the evolving pattern of risk at each phase of a project’s lifecycle would also affect regulators’ concerns and issues regarding the appropriate classification and treatment of the specific infrastructure investment.

Another distinction usually made when considering an infrastructure investment is between greenfield and brownfield infrastructure projects, with each having its own unique characteristics. Greenfield infrastructure investments involve early-stage projects at the pre-operational or construction phase where there are no established demand patterns and no income stream. Greenfield investments pose greater risk for investors in terms of cash flow uncertainty, because there would be no return in the event the project is not completed.

However, greenfield investments provide the chance to realize a greater return with potentially substantial investment gains coming in later years. Brownfield infrastructure investments involve projects already constructed, providing steady and predictable income stream for investors. According to Credit Suisse, brownfield investments typically fall in the lower risk/lower return end of the spectrum, closer to fixed-income than equities, while greenfield projects usually boast a higher risk/higher return profile, with potential investment gains coming in later years.<sup>16</sup>

The generally accepted view of infrastructure investment may be partly the outcome of an idealized market view focusing on a limited set of advantageous characteristics; i.e., inelastic demand profile being largely unaffected by economic or market fluctuations translating into moderate volatility and stable and predictable income streams and no correlation with other investments. While these characteristics tend to be shared among a certain number of infrastructure investments, there is still a large subset where some, but not all, of these favorable characteristics apply. The global financial crisis showed infrastructure investments previously viewed as conservative low-risk investments proved to be quite volatile with much lower-than-predicted cash flow, appreciably higher volatility and correlated with equity markets.

Moody’s Investors Service (Moody’s), in an infrastructure data report,<sup>17</sup> noted there may not be clear distinction between infrastructure and non-infrastructure entities, not

least because infrastructure investments are genuine hybrid credits.<sup>18</sup> A natural gas gathering and processing system, for example, may at first carry a corporate guarantee by its sponsor, which may drop off later on. Thus, the same system may be considered a corporate debt initially and then transition to infrastructure.<sup>19</sup> Often, there may be credits blending specific infrastructure risk and commodity risk. When commodity risk tends to be more dominant, as in the case of mining and oil and gas exploration and production, the infrastructure label on the investment may not even apply.<sup>20</sup>

To meet these challenges and attract institutional long-term investors, Swiss Re, in its presentation during the Valuation of Securities (E) Task Force special session, noted the need for defining a transparent, harmonized, standardized and accessible infrastructure asset class.<sup>21</sup> Ultimately, what is needed, according to Swiss Re, are infrastructure investments sharing characteristics of a widely accepted sector, emphasizing the potential of infrastructure bonds.<sup>22</sup>

### ◆ INFRASTRUCTURE INVESTMENT CHARACTERISTICS

Although infrastructure investment is admittedly a heterogeneous category, some experts have argued infrastructure investment’s appeal is actually based on common characteristics found across many infrastructure investments. However, there is scant empirical evidence regarding the presence and/or prevalence of these characteristics.<sup>23</sup>

The use of infrastructure investment as a countercyclical investment to protect against capital market downturns points to infrastructure’s insensitivity to economic cycles as one of the defining characteristics. Infrastructure investments’ insulation from the macroeconomic environment arises from its inelastic demand, which results in stable cash flows for investors.<sup>24</sup>

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<sup>15</sup> [www.value3-advisory.com/infrastructure-investments-promising-option-insurance-companies](http://www.value3-advisory.com/infrastructure-investments-promising-option-insurance-companies).

<sup>16</sup> Credit Suisse. 2010. “Can Infrastructure Investing Enhance Portfolio Efficiency?” Credit Suisse Asset Management, May 2010.

<sup>17</sup> For Moody’s, the term “infrastructure” is used in a broad sense and includes securities issued by both public and private issuers (operating companies and projects) providing large, capital-intensive, critical assets that underpin economic activity.

<sup>18</sup> Moody’s Investors Service. 2016. “Infrastructure Default and Recovery Rates, 1983–2015,” Data Report, July 2016.

<sup>19</sup> *Ibid.*

<sup>20</sup> *Ibid.*

<sup>21</sup> Swiss Re. 2016. “Infrastructure Investing. It Matters.” Presentation to the Valuation of Securities (E) Task Force, August 2016.

<sup>22</sup> *Ibid.*

<sup>23</sup> Thierie, W. and De Moor, L. 2016. “The characteristics of Infrastructure as an Investment Class,” Swiss Society for Financial Market Research, July 2016.

<sup>24</sup> Panayiotou, A. and Medda, F. 2015. “Portfolio infrastructure investments: An analysis of the European and UK Cases,” International Symposium for Next Generation Infrastructure Conference Proceedings.

Furthermore, infrastructure's generally monopolistic market position and the requirement for high initial capital investment could suggest relatively lower default rates than other investments.<sup>25</sup> According to Moody's, infrastructure investments in its rated universe are less likely to suffer credit losses than non-financial corporate debt issuers, especially over longer horizons. In the aggregate, infrastructure debt experiences significantly lower default rates than non-financial corporate issuers. The 10-year cumulative default rate for non-financial corporate issuers is about five times higher than for infrastructure.<sup>26</sup>

Infrastructure investment's long asset lifecycle is another typical characteristic. Infrastructure investments, with their long-time horizon and an undeveloped secondary market, tend to be illiquid investments and, therefore, present a different risk profile in comparison with the broader asset class of corporate bonds. In turn, infrastructure investments should provide an illiquidity premium enhancing its appeal to investors.<sup>27</sup>

The opaqueness as compared to the standard investments of life insurance companies is another feature characterizing infrastructure investment. The relative lack of information available to investors to fully assess the different risk structures creates additional uncertainty and presents a possible barrier to many investors.

An additional characteristic of infrastructure investments often discussed in articles and research reports is their ability to generate attractive inflation-adjusted returns.<sup>28</sup> Despite persistent low inflation, protection from future inflation is still a concern for most investors, adding to the appeal of infrastructure investment. However, there are doubts about the inflation-hedging properties of infrastructure investment. An article by Wurstbauer and Schäfers showed infrastructure investments' ability to hedge inflation depends on many factors such as the specific type of infrastructure, underlying revenue structure, ownership rights and time period. The dependence on multiple factors makes it problematic to definitively conclude infrastructure investments, in general, could be beneficial to investors as inflation-hedging tools.<sup>29</sup> Instead, each specific infrastructure investment should be analyzed separately to assess its individual properties and usefulness for a particular investor.

### ◆ INFRASTRUCTURE INVESTMENTS' PLACE IN INSURER PORTFOLIOS

As noted earlier, life insurance companies, with their long-term investment horizon, appear well suited to be active in the infrastructure investment space. In general, infrastructure investments are expected to be able to provide stable

and secure cash flows for life insurance companies, whose liability structure affords them more flexibility in investing in a relatively illiquid asset.

Insurance companies have also pointed to diversification benefits offered by infrastructure investments to explain their appeal. Although observed correlations are dynamic, changing dramatically with market conditions and due to exogenous factors, infrastructure investment has relatively low correlation with a number of traditional life insurance industry investment assets, with the possible exception of equities.<sup>30</sup>

Another key factor often cited by insurers driving their would-be demand for infrastructure investments is their attractive risk-adjusted returns. The insurance industry has quoted studies noting competitive spreads of 150 basis points (bps) to 250 bps for infrastructure investments with similar default rates, higher recoveries and lower volatility than corporate bonds at the same risk level.<sup>31</sup>

Ultimately, though, for infrastructure investment to earn a place in life insurers portfolios, high-quality data about any specific infrastructure project must be readily available, accessible and standardized for risk assessment.

Particularly for direct infrastructure investments, expert knowledge—not only of the financial instrument, but also of the underlying project—is essential. Public-private partnerships could potentially make infrastructure investments more attractive for life insurance companies relative to other investments. For example, certain fiscal guarantees for revenues of infrastructure projects, could be granted in order to increase the expected return on infrastructure investments and at the same time decrease their risk.<sup>32</sup>

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<sup>25</sup> Bianchi R, J. and Drew M, E. 2014. "Is Infrastructure An Asset Class? An Asset Pricing Approach," CSIRO-Monash Superannuation Research Cluster, December 2014.

<sup>26</sup> Moody's Investors Service. 2016. "Infrastructure Default and Recovery Rates, 1983-2015," Data Report, July 2016.

<sup>27</sup> Bianchi R, J. and Drew M, E. 2014. "Is Infrastructure An Asset Class? An Asset Pricing Approach," CSIRO-Monash Superannuation Research Cluster, December 2014.

<sup>28</sup> Thierie, W. and De Moor, L. 2016. "The characteristics of Infrastructure as an Investment Class," Swiss Society for Financial Market Research, July 2016.

<sup>29</sup> Wurstbauer, D. and Schäfers, W. 2015. "Inflation hedging and protection characteristics of infrastructure and real estate assets" *Journal of Property Investment & Finance*, Vol. 33 Issue 1 pp. 19-44.

<sup>30</sup> Credit Suisse. 2010. "Can Infrastructure Investing Enhance Portfolio Efficiency?" Credit Suisse Asset Management, May 2010.

<sup>31</sup> Oliver Wyman. 2016. "Infrastructure Investments" Presented to the Valuation of Securities (E) Task Force at the 2016 Summer National Meeting in San Diego, CA.

<sup>32</sup> Gründl, H., Gal J. and Dong, M. 2016, "The evolution of insurer portfolio investment strategies for long-term investing" *OECD Journal: Financial Market Trends*, Vol. 2016 Issue 1.

While life insurance companies' investment strategies depend on a variety of factors, the regulatory treatment of their investments could be important. Indeed, state insurance regulators could potentially help remove unnecessary barriers for infrastructure investment.

### ◆ REGULATORY CONCERNS AND EFFORTS

In light of the issues and the challenges surrounding infrastructure investments presented in this article, it is no surprise there are a number of concerns shared by state insurance regulators regarding the suitability of such investments for insurance companies.

First, the challenge of properly classifying and treating infrastructure investments whose risk-return profiles can be dramatically different could complicate the task of developing those appropriate regulatory changes to encourage infrastructure investment by insurance companies.

Furthermore, the fact infrastructure investment, unlike corporate debt, does not fit well within established financial metrics to properly assess the risk could be problematic. This, combined with the lack of standardized and available documentation, makes the decision of how to treat infrastructure within the existing regulatory framework challenging.

Valuation rules involving a fair value requirement or disclosure could create additional issues, given infrastructure investments, as it has been shown, are typically illiquid and difficult to value.

As noted earlier, to address these concerns, the Valuation of Securities (E) Task Force held a special session during the 2016 Summer National Meeting to explore the issue of infrastructure investment. Former NAIC President Huff emphasized the need to understand better how to define "infrastructure investment" for regulatory purposes and how it differs from what insurers invest in now.

The goal of the session was to help identify and evaluate any potential impediments to insurers wishing to invest in infrastructure projects and decide whether any changes are required and/or desired.

Working toward tackling some of these issues, the Valuation of Securities (E) Task Force and the Securities Valuation Office (SVO), in cooperation with the insurance industry, are developing new methodologies to evaluate infrastructure investments specifically related to power-generation pro-

jects. The formulation of an SVO methodology, along with the related guidance, is a first step toward articulating an analytical approach to such complex infrastructure investments. It also provides a framework against which insurers can evaluate the regulatory treatment should such transactions actually occur.

### ◆ CONCLUSION

The recognition and acceptance of the existence of a substantial infrastructure investment gap and infrastructure's contribution to economic growth does not imply, in any way, the endorsement of any changes in the regulatory framework to encourage infrastructure investment by insurers. This is especially true, if these changes run counter to the primary goal of state insurance regulation. As Former NAIC President Huff noted during the Valuation of Securities (E) Task Force special session, state insurance regulators' first priority is the solvency of regulated insurers and the financial stability of the industry.

Investing in long-duration infrastructure projects could contribute to the better matching of life insurers' assets and liabilities if they also include well predictable returns. Finding a regulatory solution for the appropriate and fair treatment of infrastructure investment should not, however, mean state insurance regulators need to incentivize insurers to engage in an imprudent investment activity.

*The author would like to thank Jeff Johnston, Ed Toy, Charles Therriault, and Robert Carcano from the NAIC for their contributions to this article.*

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