BARINGS VIEWPOINTS

May 2018

INFRASTRUCTURE DEBT: ACCESSING THE OPPORTUNITY

In the current low yield and high volatility investment environment, institutional investors have increased allocations to illiquid asset classes, including private debt, in an effort to efficiently meet portfolio needs for incremental risk-adjusted returns. Many insurance companies and pension funds have recognized infrastructure debt in particular as a distinct fixed income asset class with the potential to offer attractive risk-adjusted cash returns and other portfolio benefits, including:

- Diversification (geographic, sector, currency)
- Long tenors useful for liability matching
- Negotiated structural protections
- Reduced correlation with both economic cycles and other asset classes
- Low ratings volatility
- Low default rates
- High recovery rates

Infrastructure Debt: Accessing the Opportunity highlights the opportunity in infrastructure debt and identifies how the asset class can benefit institutional investors seeking attractive risk-adjusted returns.

Development of the Market: *A Growing Need*

Historically, most institutional investors gained access to infrastructure assets through alternative allocations to private equity funds. Access to infrastructure debt, however, has been limited for institutions due to a lack of expertise and opportunity, as banks have traditionally provided the majority of debt financing to the infrastructure sector. However, the opportunity and need for institutional investors to provide financing was highlighted during the financial crisis when banks pulled back sharply as a funding source for infrastructure projects. As banks reduced their liquidity, nimble institutional asset managers were able to hire experienced personnel and deliver value to clients by opportunistically purchasing secondary project finance bank loans and portfolios of loans in addition to private bond market opportunities.

In recent years, supported by inexpensive central bank liquidity, commercial banks have returned as the primary source of infrastructure debt financing, accounting for 85–90%.[1] While banks will continue to play an important role in project finance, the opportunity for investors will continue to grow, in our opinion, as demographics drive the need for replacement and new infrastructure investments.

INFRASTRUCTURE DEBT AT A GLANCE

STEADY CASH YIELD
Infrastructure debt is repaid from a predictable set of cash flows from critical assets

HIGHER RISK-ADJUSTED RETURN
Historically, illiquidity and project premiums have contributed to incremental spreads that range from approximately 50–75 bps in excess of the Barclays U.S. Investment Grade Corporate Index

STRONG CREDIT QUALITY
- Historically low defaults and high recoveries
- Primarily senior secured structures

NEGOTIATED STRUCTURAL BENEFITS
- Covenant protection
- Prepayment protection

LOW CORRELATION
Performance has shown a lower correlation with both economic cycles and other asset classes

BUY AND HOLD
Infrastructure debt may be suitable for buy-and-hold investors given the high credit quality, long tenors and structural protections of the asset class

LONG DATED MATURITIES FOR LIABILITY MATCHING
Five to 30+ year maturities

RATED AND UNRATED
Bond holders often require ratings while bank lenders do not

FIXED AND FLOATING RATE INTEREST
Typically, bonds pay fixed rates & bank loans pay floating rates

DIVERSIFICATION BENEFITS

Geographies	Infrastructure provides global investment opportunities
Sectors	Core infrastructure (roads, airports, ports, public private partnerships), power and energy (generation, transmission and distribution), commercial & industrial (key private assets)
Currencies	USD, GBP, EUR, AUD and others

1. Source: Thomson Reuters and InfraDeals 2015 Trend Report. As of January 27, 2016.

Banks will likely be limited to an extent by increased regulatory pressure. Specifically, increased capital reserve requirements, Dodd Frank, Basel III, and related regulations continue to impact the profitability of long-term loans for banks. As a result, non-bank lenders are stepping in and working collaboratively with sponsors and bank advisory teams to fill the void and play an increasingly active role in meeting the long-term capital needs of infrastructure projects. Further, a few firms such as Barings, with their historical presence and ability to originate and play a key structuring/origination role, are actively stepping in to increase the infrastructure debt opportunity set available to institutional investors.

At the same time, **THE GLOBAL NEED FOR INFRASTRUCTURE HAS CONTINUED TO GROW:**

McKinsey estimates that
$3.7 TRILLION
will need to be invested annually in economic infrastructure through 2035.[2]

D+
The overall grade assigned to American infrastructure by the American Society of Civil Engineers.[3]

A$75 BILLION
The amount the Australian government plans to invest in the country's infrastructure over the next 10 years.[4]

$20.5 BILLION
The figure the U.S. Federal Highway Administration estimates will be required annually just to address the backlog of deficient bridges by 2028.[3]

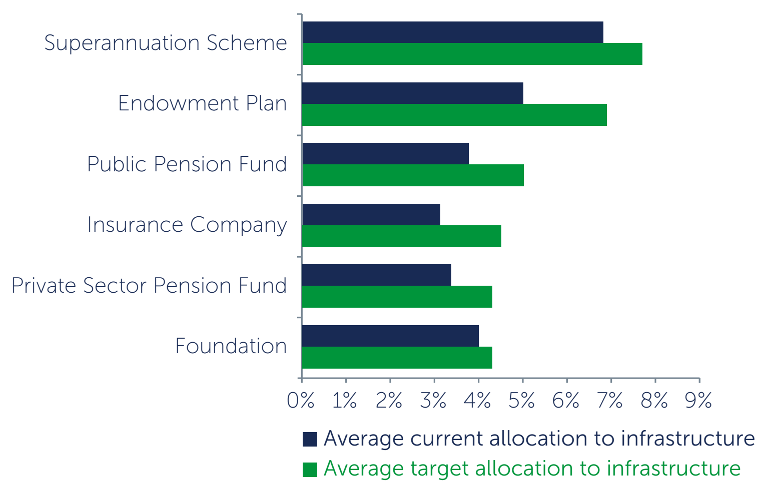
Standard & Poor's has identified a funding gap of
$500 BILLION
per annum as governments continue to struggle under heavy debt loads and budgetary constraints and banks face increasing regulatory pressure.[5]

The United Kingdom outlined a pipeline of
£480 BILLION
worth of projects in its 2016-2021 National Infrastructure Plan, the "majority of which is expected to be privately funded and financed."[6]

Over time, increased allocations to infrastructure debt by institutional investors are expected to help make up the projected funding shortfall. Insurance companies, pension funds and asset managers are currently the three largest types of institutional investors active in infrastructure.[5]

According to McKinsey, institutional investors will provide $2.5 trillion to infrastructure financing by 2030 if they achieve their target allocations—which are estimated to be between 3% and 8% of total assets under management—by 2020. These target allocations include both equity and debt, but as equity returns on core infrastructure investments continue to be pressured by excess liquidity, infrastructure debt is increasingly viewed as an attractive way to access the steady cash flows and other benefits offered by infrastructure assets.

FIGURE 1: BREAKDOWN OF AVERAGE CURRENT/TARGET ALLOCATION TO INFRASTRUCTURE BY INVESTOR TYPE



SOURCE: *PREQIN INFRASTRUCTURE ONLINE, 2017.*

2. Source: McKinsey. As of October 2017.
3. Source: American Society of Civil Engineers, 2017 Report Card.
4. Source: Thomson Reuters. As of May 2017.
5. Source: Standard & Poor's. As of April 2015.
6. Source: U.K. National Infrastructure Plan, 2016-2021.

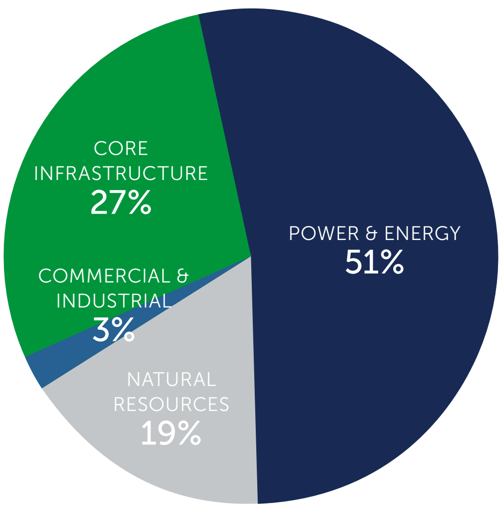
BARINGS DEFINES INFRASTRUCTURE AS:

"Critical, long-lived, capital intensive assets with competitive barriers that meet key social and/or economic needs."

Core Infrastructure, Power & Energy and Commercial & Industrial accounted for

$237 BILLION

of the total $293 billion of project debt issued in 2017.



SOURCE: *THOMSON REUTERS PFI. AS OF JANUARY 2018.*

Defining the Market

Given both the developing infrastructure debt investment opportunity and increasing demand for long-lived assets, it is critical that institutional investors and their asset managers have a common understanding of what constitutes "infrastructure" as an investable asset class. There is no uniform definition among asset managers, banks, and equity investors, and infrastructure assets are financed both through corporate and project finance structures.

At Barings, our definition of infrastructure is focused on the type of asset generating the cash flow rather than the financing structure, and we focus on the types of assets we believe will generate stable, long-term cash flows for investors. Barings defines infrastructure as: *Critical, long-lived, capital intensive assets with competitive barriers that meet key social and/or economic needs.*

We further categorize infrastructure assets into three sectors, based on the social and economic needs being served by the asset as well as on the source of the asset's cash flows:

1. CORE INFRASTRUCTURE
   - Transportation assets e.g. roads, ports, airports, and rail
   - Public Private Partnerships (PPP), where governments are the ultimate source of payment for an infrastructure asset e.g. roads and hospitals
   - Water / wastewater systems
2. POWER & ENERGY
   - Generation, transmission & distribution, and midstream assets
   - Contracted revenues with creditworthy counterparties and limited exposure to merchant risk
3. COMMERCIAL & INDUSTRIAL
   - Privately owned assets that are critical to a corporate enterprise e.g. team stadiums or corporate petrochemical assets

Another segment often included in the definition of infrastructure is Natural Resources. However, Barings' infrastructure debt strategy does not include direct investment in Natural Resources assets, as the cash flows tend to be more vulnerable to commodity price volatility. As such, these assets are, in our opinion, less likely to generate the reliable cash flows typically seen in high-quality infrastructure debt investments.

Under this definition, the addressable debt market that Barings targets is more discrete than the overall global infrastructure market. As of July 2017, the overall global infrastructure debt market was roughly $400 billion.[7] By contrast, we estimate Barings' investable universe to be roughly $50 to $75 billion.

This distinction is due to the overall market including below-investment grade projects and projects where state financing is the source of funds. Also, many projects are located in countries or sectors that tend to experience greater volatility, such as emerging markets and the oil & gas or mining sectors.

7. Source: Deutsche Asset Management.

"The opportunity to earn a premium in exchange for giving up short-term liquidity can be particularly attractive to investors with long-term liabilities..."

Key Benefits of Infrastructure Debt

While we acknowledge that there is a wide range of credit quality in the infrastructure debt space, we believe the higher-quality assets that comprise Barings' key focus area, or "addressable" market, can offer a number of potentially attractive portfolio benefits.

POTENTIAL FOR INCREMENTAL RISK-ADJUSTED RETURN

Many institutions are allocating to infrastructure debt to capture the incremental yield provided by the premiums associated with the market's illiquidity and structural complexity. The opportunity to earn a premium in exchange for giving up short-term liquidity can be particularly attractive to investors with long-term liabilities that do not need 100% of their portfolio in liquid assets. In Europe in particular, where sovereign bond yields are at historically low levels, infrastructure debt has become an attractive addition to fixed income core asset classes such as investment grade corporate bonds and sovereign bonds.

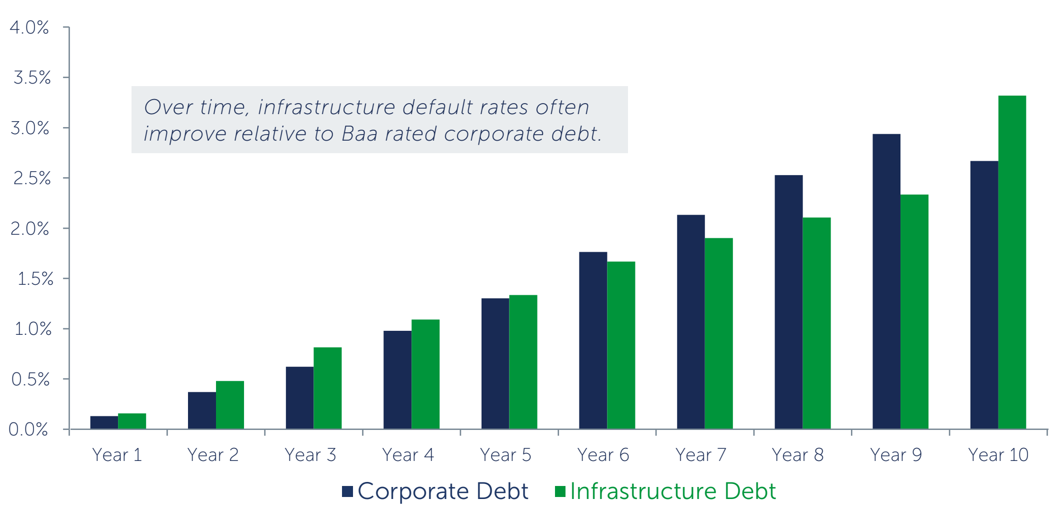
We estimate that over time, investors can capture an average spread premium of approximately 75 basis points (bps) relative to comparably rated corporate bonds. Historical spreads on investment grade infrastructure deals relative to U.S. Treasuries range from 150 bps to 300 bps. On the other hand, non-investment grade spreads relative to Treasuries typically have ranged from 350 bps to 500 bps.

LOW DEFAULT & HIGH RECOVERY RATES

Default rates for similarly rated infrastructure and corporate debt are comparable, with the cumulative default rates for infrastructure debt improving relative to corporate debt over time. A study from Moody's found that the 10-year cumulative default rate for project finance bank loans is similar to investment grade (Baa) corporate issuers, with infrastructure ratings showing more stability over time and through economic cycles (FIGURE 2).

In addition, infrastructure debt is one of the only asset classes where credit quality tends to improve over time, and Moody's default data suggests that a credit upgrade is often possible in connection with construction projects. According to Moody's, the initial three-year period of a construction project, which includes the commencement of the project and the ramping-up of operations, tends to be the riskiest. Typically, during this period, default rates are in line with Ba rated corporates. Over time, however, default rates often improve, becoming more

FIGURE 2: Baa CUMULATIVE DEFAULT RATES
CORPORATE DEBT VS. INFRASTRUCTURE DEBT



SOURCE: *MOODY'S. AS OF JULY 2017.*

consistent with higher, single A-rated corporates (FIGURE 3). Historical recovery rates for rated and unrated infrastructure debt also compare favorably to corporate debt. According to Moody's, average infrastructure debt recoveries have ranged from approximately 56% (unsecured) to 74% (secured), with more than half of lenders likely to have achieved 100% recovery. Corporate debt recoveries, on the other hand, have ranged from 38% (unsecured) to 54% (secured).[8]

Notably, recovery rates for project finance bank loans have been substantially independent of the economic cycle at both the time of default and the emergence from default, according to Moody's. This is in contrast to corporate loans and bonds, where recovery rates tend to decrease in response to increases in default rates.

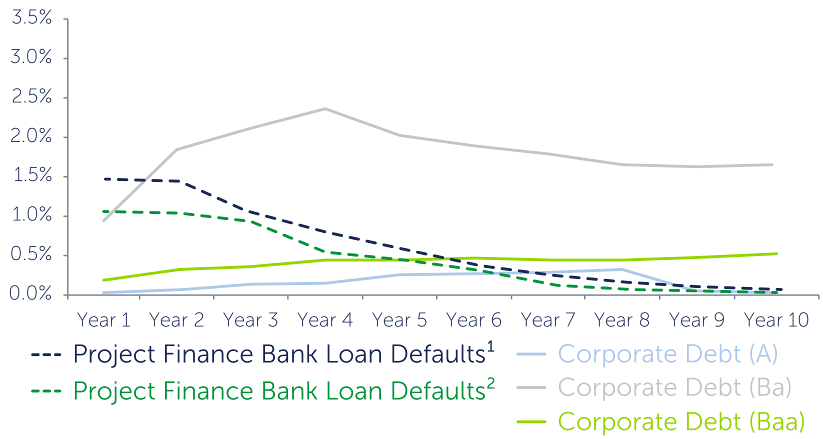
> *"The combination of long-duration assets and steady cash flows may be attractive to institutional investors who require tenor or need to meet specific asset-liability management criteria."*

DIVERSIFICATION

Infrastructure debt can be an effective diversifier in a portfolio that already includes more traditional, long-term fixed income assets such as sovereign and investment grade corporate bonds. Infrastructure debt is very much a global asset class, funding critical projects in both developed and emerging countries around the world. Projects also span a wide range of sectors and sub-sectors, all of which exhibit unique risk-return profiles. Even projects within the same sector can offer diversification, such as exposure to different regulatory regimes and payment mechanisms.

Diversifying across this multifaceted asset class can be particularly beneficial to investors who are able to invest in multiple currencies, and can position them to seek the best relative value for similar projects in different geographies.

FIGURE 3: OVER TIME, DEFAULT RATES HAVE OFTEN IMPROVED, BECOMING MORE CONSISTENT WITH SINGLE A-RATED CORPORATES *MARGINAL ANNUAL DEFAULT RATES*



1. BASED ON THE BASEL II DEFINITION OF DEFAULT.
2. BASED ON THE MOODY'S DEFINITION OF DEFAULT.
SOURCE: *MOODY'S. AS OF JULY 2017.*

LONG-DATED MATURITIES FOR LIABILITY MATCHING

The long maturities typical of infrastructure assets can also potentially benefit institutional investors. Infrastructure debt maturities typically range from five to 30 years, with fixed rate debt offering a longer average maturity (12 to 15 years) than floating rate debt (3 to 7 years). The long-dated debt is supported by highly predictable cash flows generated by the long-lived infrastructure assets being financed. The combination of long-duration assets and steady cash flows may be attractive to institutional investors who require tenor or need to meet specific asset-liability management criteria. European insurance companies, for example, have been paying very close attention to duration in response to Solvency II, which can impose significant capital charges if there is a mismatch between the assets insurers hold as investments and the liabilities the assets are intended to offset.

LOW CREDIT QUALITY VOLATILITY

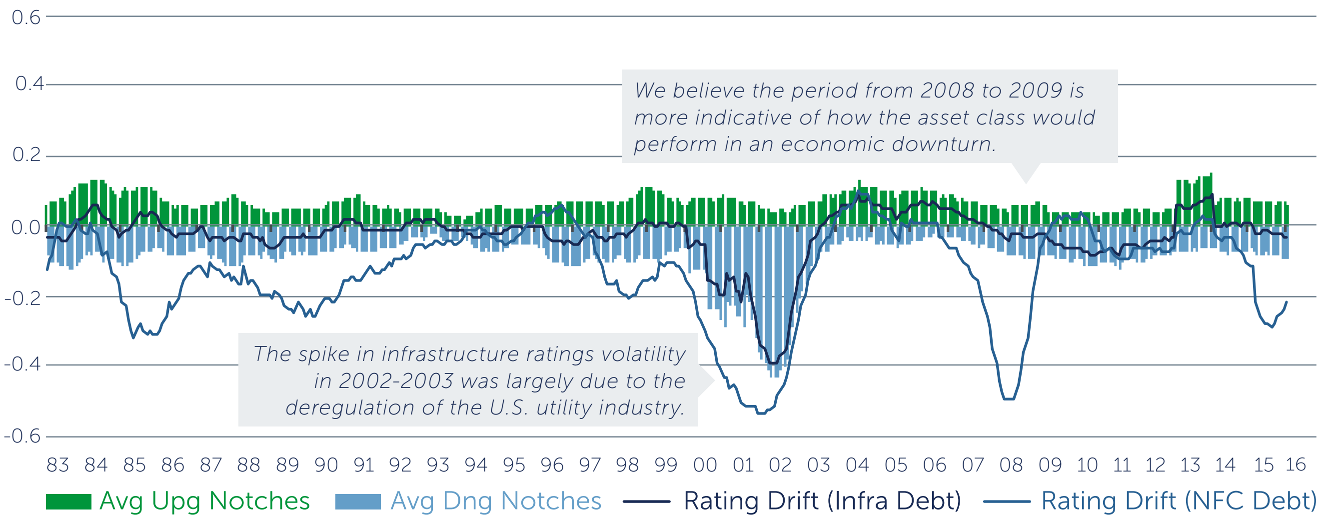
Infrastructure debt's ratings are generally stable as the critical nature of infrastructure assets, combined with either fully contracted revenues or sufficiently robust cash flows, allow the debt to withstand downside scenarios for extended periods of time. According to Moody's, infrastructure debt ratings volatility is approximately 20% lower than that of non-financial corporate debt. This is due in large part to its relative protection from certain business cycles. Infrastructure debt has experienced significantly fewer downgrades than non-financial corporate debt since 2000, performing steadily even during economic downturns.

For instance, from 2008 to 2009, when non-financial corporates suffered widespread downgrades, infrastructure ratings remained relatively stable (FIGURE 4). It is worth noting that the spike in infrastructure ratings volatility in 2002-2003 was largely due to the deregulation of the U.S. utility industry. However, given infrastructure debt's low correlation with other asset classes and relative lack of exposure to the credit cycle, we believe the period from 2008 to 2009 is more indicative of how the asset class would perform in an economic downturn.

8. Source: Moody's. Data period: 1983–2015. Includes data on infrastructure and corporate recoveries.

FIGURE 4: ACCORDING TO MOODY'S, INFRASTRUCTURE DEBT RATINGS VOLATILITY IS APPROXIMATELY 20% LOWER THAN THAT OF NON-FINANCIAL CORPORATE DEBT

RATINGS VOLATILITY (1983-2016) *CORPORATE DEBT VS. INFRASTRUCTURE DEBT*



SOURCE: *MOODY'S. AS OF JULY 2017.*

Access to Infrastructure Debt

In order to access the full spectrum of potential benefits offered by the largely private world of infrastructure debt, it is important that investors partner with managers that have an experienced origination team and strong relationships with banks (which still control most of the origination), advisors, sponsors and other key market participants. As mentioned earlier, the accessible infrastructure debt market is relatively small when compared with overall demand, and most of the deals in the market are directly originated and privately negotiated. As such, managers that have strong, established partnerships with market participants should be best positioned to see the largest pipeline of opportunities and source the highest quality deals for investors.

The ability to structure deals properly is also critical to successful origination. Typically, infrastructure deals include structural protections such as maintenance financial covenants that can help manage risks associated with construction, operation, regulation or other factors. An experienced origination team may also have a better sense of where the market is moving in terms of pricing. This understanding is critical, as the infrastructure debt markets tend to lag the benchmarks by at least six to 12 months. In addition, the time between an infrastructure deal's bid and close tends to be long, and is not always a good indicator of the current market. Given these uncertainties, we believe an experienced manager with expansive geographic coverage and a long track record in the market is well positioned to find the best value at any given time.

RISKS

While we see many opportunities in infrastructure debt, it is also important for investors to carefully consider the risks, including:

Complexity Risk: Infrastructure finance is highly structured and specialized with regard to the method of financing as well as the attributes of the asset being financed.

Credit Risk: Infrastructure investments are exposed to the risk that the underlying parties making payments to infrastructure assets do not make their contracted payments in full and on time.

Economic Risk: Volume-based infrastructure assets such as toll roads and maritime ports may see their revenues and ability to service debt investments impacted by an economic downturn, which could lead to less use of the infrastructure asset and a correlated decline in revenues.

Illiquidity Risk: The infrastructure debt market is less liquid than the broadly syndicated loan and bond markets, meaning investments are not traded as frequently (or at all) in the secondary market. This creates the risk that investors looking to sell their securities may not be able to find a buyer.

We believe it is critical for managers to understand investors' risk profiles, which is why we take a conservative approach to managing risk and volatility for our clients. At Barings, we maintain a highly selective investment approach with a focus on credit quality, appropriate pricing and structural protection. A critical part of our underwriting process for each investment is the documentation and associated structural protections, including financial covenants.

Conclusion

Infrastructure debt can offer access to high-quality assets that may provide incremental, risk-adjusted cash returns, particularly for investors able to allocate to illiquid private debt assets. In order to access the broadest selection of high quality investment opportunities with attractive incremental risk-adjusted returns, we believe investors can benefit from partnering with experienced managers who have long-standing relationships with key market participants, access to a large and diverse pipeline of opportunities, and the ability to appropriately structure, price and monitor the investments. This access is critical for investors seeking long-term capital, and positions them to capitalize on both opportunistic and fundamental investment opportunities in the growing asset class.

BARINGS' GLOBAL INFRASTRUCTURE DEBT GROUP

Barings' experience investing in infrastructure debt dates back to the 1980s, when we began investing proprietary capital on behalf of our parent company, MassMutual. In the decades that followed, we actively financed both rated and unrated deals that met the largely fixed-rate, investment grade quality investment criteria of our U.S. insurance company parent.

Since inception, our Global Infrastructure Debt Group has grown significantly. Today our team manages more than $10 billion of global infrastructure debt investments, over 90% of which are investment grade and roughly 50% of which represent non-U.S. assets. Barings' Private Finance Group, which includes the Infrastructure Debt Group, has six offices worldwide including London, Hong Kong and Australia. Our team consists of both experienced buy-side analysts who understand institutional investors and their sensitivities, and former project finance and capital markets bankers who maintain longstanding, direct relationships with issuers, sponsors and consultants.

The strong partnerships we have formed with key market participants around the globe enable us to seek out what we believe are the most attractive risk-adjusted return opportunities for our clients. In the last three years alone, our broad exposure and robust origination capabilities allowed us to be disciplined and selective when investing our clients' money, evidenced by the fact that of the 484 deals we reviewed, we closed 111, or less than a quarter of them.

GLOBAL INFRASTRUCTURE DEBT INVESTMENT ACTIVITY *(2015–2017)*

Transactions Reviewed	484	Investment Grade	$5.85 billion
Transactions Closed	111	Non-Investment Grade	$0.12 billion
Investment Rate	23%	U.S. Investments	$2.92 billion
Total Amount Invested	$5.97 billion	Non-U.S. Investments	$3.05 billion

EMEKA ONUKWUGHA, CFA, MANAGING DIRECTOR

Emeka Onukwugha is Head of Barings' Private Debt Group and is a member of the Global Infrastructure Debt Investment Committee, Private Placement Investment Committee and the MassMutual Asset Finance Investment Committee. He manages a number of the group's key relationships and is active in day to day investment analysis and portfolio management. Emeka has more than 25 years of industry experience that has encompassed commercial banking, structured credit and project finance. Prior to joining the firm in 1998, he worked in Fleet Bank's commercial banking department. Emeka holds a B.A., an M.A. and an M.B.A. from the University of New Haven, and is a member of the CFA Institute.

Barings is a $305+ billion global financial services firm dedicated to meeting the evolving investment and capital needs of our clients. We build lasting partnerships that leverage our distinctive expertise across traditional and alternative asset classes to deliver innovative solutions and exceptional service. Part of MassMutual, Barings maintains a strong global presence with over 1,800 professionals and offices in 16 countries.*

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*As of March 31, 2018

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