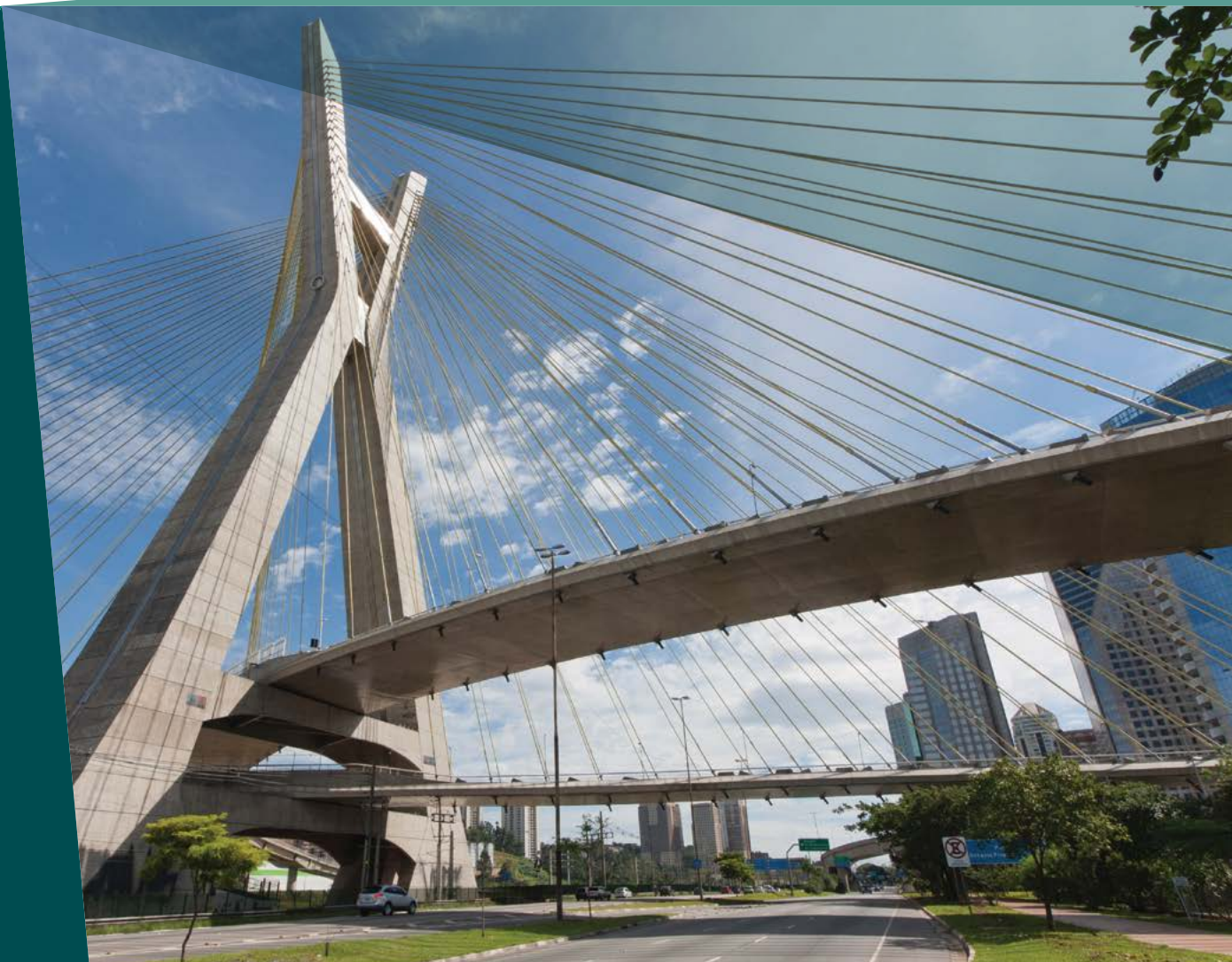


ENHANCING PRIVATE INFRASTRUCTURE INVESTMENT IN BRAZIL

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CONTENTS

EXECUTIVE SUMMARY	3
ENVISIONING BRAZIL'S FUTURE INFRASTRUCTURE INVESTMENT MARKET	4
RECOMMENDATIONS FOR OPTIMIZING INFRASTRUCTURE FUNDING GROWTH	5
I BRAZIL'S INFRASTRUCTURE FUNDING CHALLENGE	6
II INFRASTRUCTURE INVESTMENT AND THE PRIVATE MARKET	13
PRIVATE INVESTMENT CHALLENGES	17
INCREASING PRIVATE INVESTMENT IN INFRASTRUCTURE: COUNTRY EXAMPLES	20
III THE WAY FORWARD: OPTIMIZING INFRASTRUCTURE INVESTMENT	21
OPTIMIZE THE FINANCIAL STRUCTURE	23
OPTIMIZE THE TRANSFER OF SUBSIDIES	26
OPTIMIZE RISK MANAGEMENT	26
WORK TOWARD MITIGATION OF NON-MANAGEABLE RISKS	29
OPTIMIZE THE CAPITAL MARKET	32

EXECUTIVE SUMMARY

As described in the World Economic Forum's recent paper, the *Infrastructure Investment Policy Blueprint*,¹ which was developed in collaboration with Oliver Wyman, countries around the world are facing an acute need for new and modernized infrastructure; the estimated shortfall in global infrastructure debt and equity investment currently stands at some US\$1 trillion per year. Brazil is one of the many countries experiencing a growth "bottleneck" due to a lack of infrastructure: Although Brazil's economy is the sixth largest in the world, the country ranks 114th in overall infrastructure quality.²

The objective of this paper, which is based on a series of interviews conducted by Oliver Wyman in Brazil with senior executives at major banks and investment funds, is to provide recommendations on how to promote a market for private investment in viable infrastructure projects for Brazil through better risk-return tradeoffs for investors.

The Brazilian government has recently announced planned investments in infrastructure (through a mix of government and private funding) of R\$500 billion over the next decade, with a focus on priority areas such as transport and logistics, energy, and oil and gas.³ As a result, annual investment in infrastructure will increase from the average of two percent of GDP spent over the past two decades to an average of just under three percent between 2015 and 2018.⁴

To kick-start the current program, the government has developed guidelines to fund up to 80 percent of project costs via the Brazilian Development Bank (BNDES) at subsidized rates – a volume of investment that will put significant pressure on the bank's balance sheet.⁵ Going forward, increased pressure on public spending, stricter requirements on bank capital, and leverage ratio constraints will make it challenging for the government to support infrastructure investment using this funding model. Thus, greater participation by private investors will be needed to expand the country's capacity to invest in infrastructure and help deflate the government's balance sheet.

The government has acknowledged the need for greater private investment in infrastructure. Recently, new laws regulating tax incentives for infrastructure bonds have been put in place to tap into alternative debt investors from the private sector. Private funding is still expensive, however, which can limit the ability of equity holders to target new investors and to compete with BNDES' subsidized funding.

1 The WEF paper can be obtained online at: <http://www.weforum.org/reports/infrastructure-investment-policy-blueprint>.

2 World Economic Forum Global Competitiveness Report, 2012-2013.

3 Brazilian Ministry of Finance.

4 Brazilian Ministry of Finance, Oliver Wyman analysis.

5 Percentage varies with sector: Up to 65 percent for ports, 70 percent for airports, and 80 percent for railways and highways. The proposed rate is TJLP + two percent, which is currently seven percent per year. Source: Brazilian Ministry of Finance.

Pension funds and insurance companies are often pointed out as a good fit for infrastructure investing, as they have inflation-indexed, long-term liabilities and infrastructure investment can provide them with duration and inflation hedging as well as further portfolio diversification. Canada and Australia, for example, have demonstrated the positive benefits of this synergy.

The pension fund segment in Brazil is growing strongly (R\$630 billion as of June 2013),⁶ but there is still plenty of room for further growth – less than two percent of Brazilian pension funds' assets are currently invested in infrastructure. What is critical is to sufficiently incentivize funds and other long-term investors to participate in infrastructure projects, as attracting private investment to the sector could substantially reduce the impact of funding on the country's fiscal account over the next ten years. (We estimate that an additional R\$60 billion in private investment would reduce Brazilian Treasury fiscal transfers equivalent to 1.6 percent of GDP over this period.)

ENVISIONING BRAZIL'S FUTURE INFRASTRUCTURE INVESTMENT MARKET

BNDES fills an important role by providing subsidized funding for projects, while the Brazilian banks provide credit risk support. This structure will continue to play a key role in providing funding for the construction and transition phases of higher-risk infrastructure projects, i.e., during the first 3-5 years of project lifetimes.

Long-term funding for the operational phases, however, could be supplied by pension and insurance investors, thereby involving the private sector and providing relief to BNDES and government balance sheets. Low-risk projects might even be funded from the outset by private investment. Types of projects that fall into this category include, for example, extensions or privatizations of existing projects and low-risk programs in areas of high commercial demand (e.g., Sao Paulo mobility projects). During the transition to a model with greater private sector participation, a broader use of insurance and guaranty funds, as well as the tranching of debt in different risk segments, could help decrease the cost of capital and the need for public funding in the short-run. Alternatively, involving multilateral agencies more systematically could also provide relief to the government, as these have strong control mechanisms and access to a different pool of investors.

The risk-return profile of a given project will depend on specific project characteristics and financial structuring, and each investor will require particular financial instruments that offer a risk-return profile matched to their needs. Many of these instruments are already available, but some require a deepening of the market and an increase in the availability of projects to be fully viable.

⁶ Includes closed pension funds only. Source: ABRAPP.

RECOMMENDATIONS FOR OPTIMIZING INFRASTRUCTURE FUNDING GROWTH

1. **An efficient financial structure** will cost effectively allocate residual risks and cash flows among different sponsors. Worldwide, countries use credit-enhancing initiatives to help unlock capital in the market and optimally allocate risk. Examples include a more efficient sharing of guarantees between investors and attaching insurance to infrastructure bonds. Additional measures may come through risk-based tranching of funding, which would, however, require a review of the current structure of guarantees.
2. **Risk structuring and credit enhancements** should be pursued jointly with **optimizing the structure of subsidies**. The conditions under which subsidies are offered should be supported by a thorough viability study and, ideally, type and volume of subsidies should be an output of the valuation and viability exercise. Given limitations on public funds, subsidies need to be based on cost-benefit analysis and focused on high-cost, high-risk, or high-externalities projects that are unlikely to be funded otherwise. Subsidies should be structured to ensure budgeting is transparent and to limit abuse and crowding out of private funds.
3. **Optimizing risk management** is essential to guaranteeing the highest possible credit rating for a project and, consequently, the lowest cost of capital. An effective risk assessment, management, and mitigation process is important to all project stages and should incorporate the dynamics of the probability of default and of loss in the case of default. It is important to choose a risk assessment approach that does not overestimate risk costs. Oliver Wyman advocates the use of cash flow-based risk assessment, which allows for re-rating throughout the project. In addition, investors need to view their investments as a portfolio of cash flows with different sensitivities, where each marginal project may act either as a natural hedge or increase risk levels in a non-linear way.
4. The government should set the ground for long-term **mitigation of non-manageable risks**, currently one of the major sources of cost for infrastructure projects. Data collection and disclosure of information on project performance is a particularly important element for investors seeking to quantify risk, and to facilitate improvement of the process on an ongoing basis. The licensing process, currently one of the most-cited sources of costs, must be standardized and streamlined, and a more effective hearing process is needed to avoid project disruptions due to public concerns. In the event of default, trust structures can be used to reduce recovery and asset transfer costs.
5. The capital market in Brazil is well developed, with a broad set of instruments across asset classes and solid regulation and oversight. However, the volume of bond issues is still low. Key actions could be taken to **optimize capital markets and increase market depth**, including increasing rating transparency, developing trade reporting requirements, allowing high-quality infrastructure bonds to be used as collateral, etc.

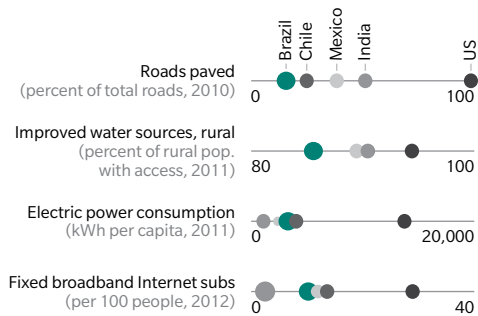
Infrastructure is clearly the key to unlocking Brazil's vast potential for growth. A better understanding of project risks, coupled with process improvements to streamline project development and concessioning, and increased support for equity and debt markets, will enhance the interest of private investors in the sector and lighten the load for government as it seeks to bring Brazil's infrastructure into the 21st century.

I. BRAZIL'S INFRASTRUCTURE FUNDING CHALLENGE

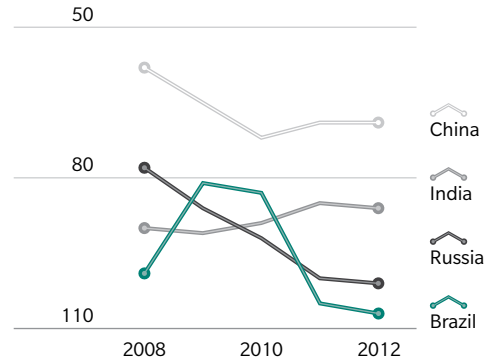
Brazil's economic expansion over the past few decades has not been accompanied by adequate investment in infrastructure, resulting in an infrastructure gap (Exhibit 1) that is now a major impediment to further growth. Brazil, currently the sixth largest economy in the world, ranks 114th in terms of the overall quality of its infrastructure, behind China, India, and Russia, as well as other Latin American countries such as Mexico and Chile. Bridging the infrastructure gap will require significant investment, estimated to be as high as R\$1.1 trillion, the equivalent of one-fourth of Brazil's 2012 GDP.⁷

EXHIBIT 1: THE INFRASTRUCTURE GAP IN BRAZIL

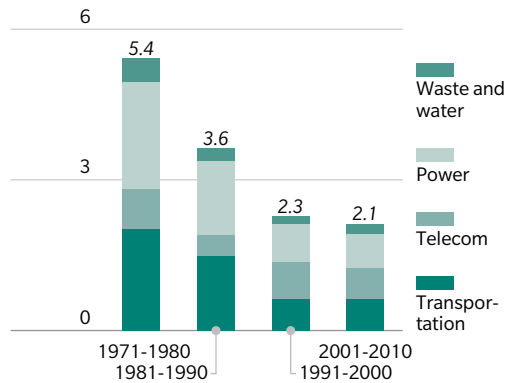
INFRASTRUCTURE INDICATORS
PERCENT OF GDP, 2010-2012



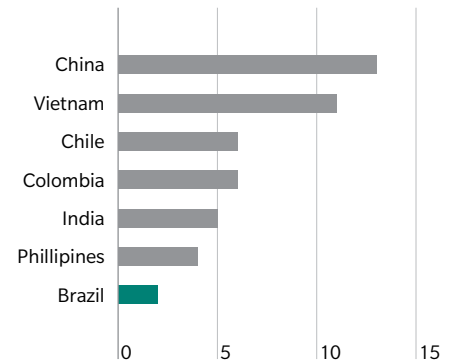
GLOBAL RANKING OF QUALITY OF INFRASTRUCTURE
2008-2012



BRAZIL'S INVESTMENT IN INFRASTRUCTURE
PERCENT OF GDP, 1971-2010



INVESTMENT IN INFRASTRUCTURE PER COUNTRY
PERCENT OF GDP, 2011



Source World Economic Forum, *Global Competitiveness Report 2013-2014*; Brazilian Ministry of Finance; Credit Suisse

7 Credit Suisse, IBGE.

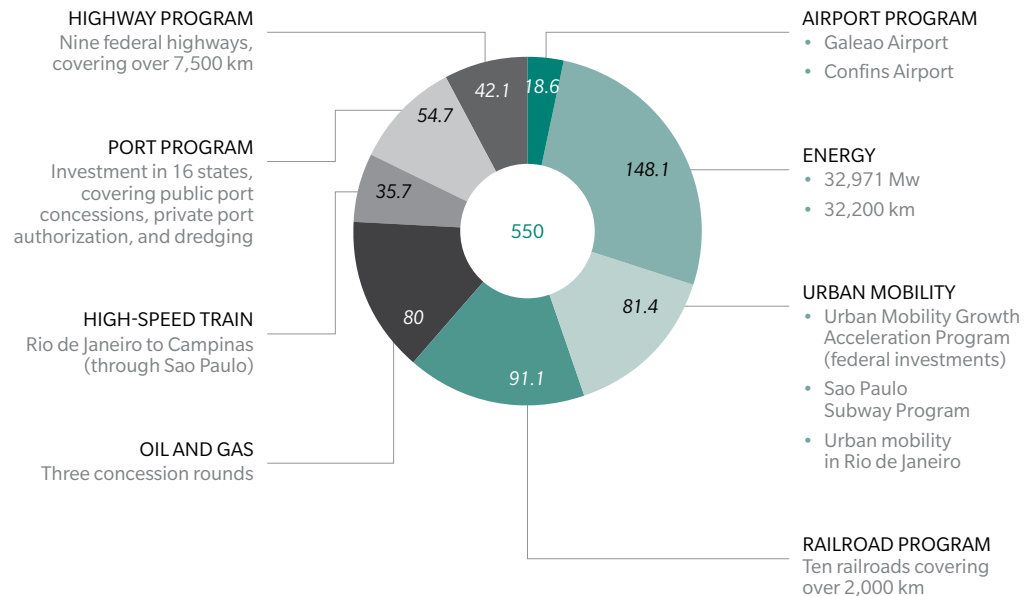
The Government of Brazil recently launched a new infrastructure program, which should lead to combined government and private investment of R\$500 billion (just over ten percent of GDP) over the next decade. Investments will be made in areas such as transportation, energy, and oil and gas (Exhibit 2), with annual investment in infrastructure increasing from an average of two percent of GDP to an average of just under three percent between 2015 and 2018.⁸

The government plans to structure investments such that between 65 and 80 percent of each project could be funded through Brazilian Development Bank (BNDES) loans. BNDES is funded primarily from transfers on contributions imposed on payroll.⁹ Any mismatch between funding and lending rates, as well as any increase in capitalization, will require further transfers from the Treasury. Since 2007, BNDES' assets have more than tripled, increasing the stock of Treasury credits from 0.2 percent to eight percent of GDP (in 2012).

Given the long-term nature of BNDES loans, there appears to be little room at present to expand lending to infrastructure projects without either decreasing the volume lent to other sectors or further increasing transfers from the government. Following the current schedule for infrastructure investment, we estimate that BNDES funding needs could amount to as much as six percent of GDP by 2025. If transfers from the Treasury are required, this will put further pressure on the government's accounts as its gross debt increases (Exhibit 3).¹⁰

EXHIBIT 2: DISTRIBUTION OF PLANNED INVESTMENTS IN INFRASTRUCTURE

R\$ BILLION



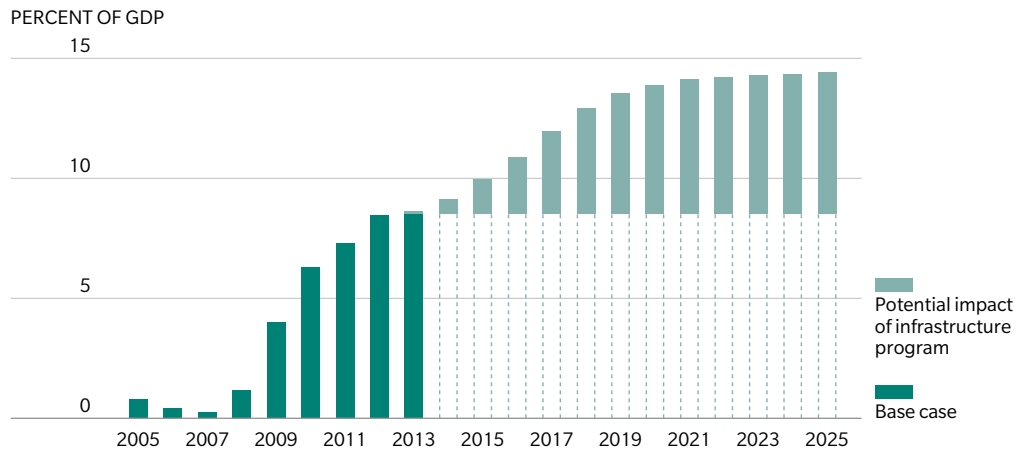
Source Brazilian Ministry of Finance

⁸ Brazilian Ministry of Finance, Oliver Wyman analysis.

⁹ FAT, PIS, and PASEP.

¹⁰ Treasury transfers to BNDES are done outside of the central government's budget and have no impact on net debt, but do impact gross debt, and must be funded either through taxes or debt.

EXHIBIT 3: OUTSTANDING TREASURY CREDITS WITH BNDES



Note The dashed boxes in the exhibit have been plotted assuming partial interest payment and no amortization from BNDES to the Treasury, as observed since 2009. There have been recent discussions within the government to decrease the volume of outstanding BNDES debt with the Treasury, which would shrink the dashed boxes. The light green boxes represent the stock of Treasury credit with BNDES due to the infrastructure program, i.e., its potential marginal impact on BNDES debt. For the sake of illustration, we have assumed that the recent pattern of no amortization and partial interest payment is kept in coming years

Source Brazilian Central Bank, BNDES, Brazil Ministry of Finance, ItauBBA, Oliver Wyman analysis

Looking at the current market, one can observe that long-term bonds currently being issued by the Brazilian government are paying ~12 percent per year, whereas the government lends to BNDES at ~5 percent per year.¹¹ The difference between borrowing and lending rates would imply a yearly seven percent cost per Real loaned to BNDES.¹² Adding this financial cost to yearly funding requirements (Exhibit 4), funding needs linked to the infrastructure program could cost on average the equivalent of five percent of central government expenditures per year between 2014 and 2017, which is equivalent to an accumulated R\$200 billion.¹³

The expansion of a country's infrastructure has a positive effect on growth and an average yearly investment equivalent to five percent of expenditures (~1 percent of GDP) would be a reasonable price to pay. According to estimates, however, yearly investment of at least five percent of GDP (versus the current two percent) will be required over the long run to close Brazil's infrastructure gap.¹⁴ BNDES can play a key role in paving the way for investment, especially in areas with little private investment tradition, such as the railroads. But given the pressures on government accounts, a long-term solution will require less reliance on public funds.

The Brazilian government has acknowledged the need to attract more private investment. Several fixed-income instruments with tax incentives have been recently created to bring more private money into infrastructure. The target capital structure suggested by the government for transportation projects, for example, is to have between five and 20 percent funded via private infrastructure bonds (Exhibit 5).

¹¹ The Treasury generally charges BNDES the long-term funding rate, TJLP, which currently stands at five percent. Bond data relate to issuance of 2024 NTN-B in 2013. BNDES's lending rate for infrastructure projects can be as low as TJLP + two percent or one percent for railways. Source: BNDES, Anbima.

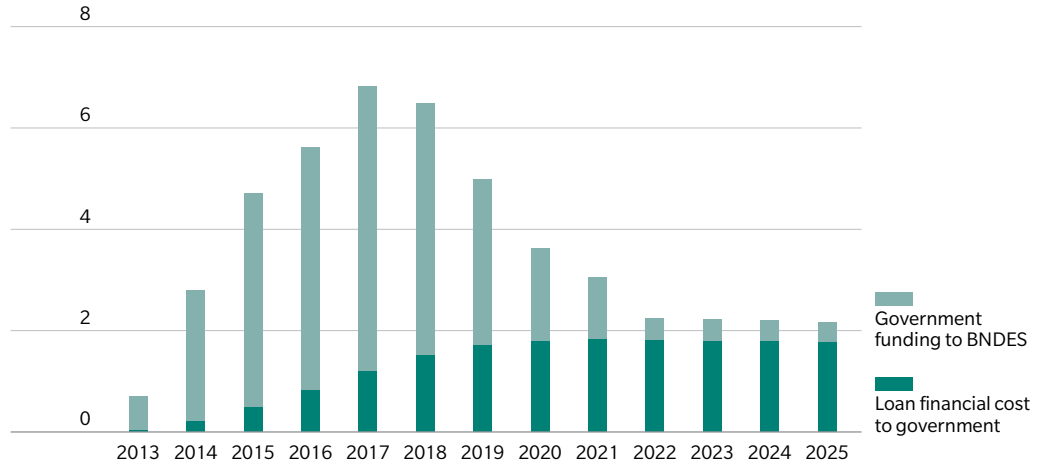
¹² Assuming an average of 75 percent leverage and that the debt is funded by BNDES. Long-term government bonds are mainly inflation-indexed and are currently paying around six percent real interest rate. Inflation rate expectation is around six percent a year.

¹³ Assuming 2.4 percent GDP in 2013, the 2014 central government's total budget represents ~50 percent of GDP. We have kept this ratio constant going forward.

¹⁴ Oliveira, G. and Luiz Chrysostomo de Oliveira Filho eds, *Parcerias Publico-Privadas*. 2013, LTC, Brazil.

EXHIBIT 4: COMPARISON OF INFRASTRUCTURE PROGRAM FUNDING NEEDS TO GOVERNMENT EXPENDITURES

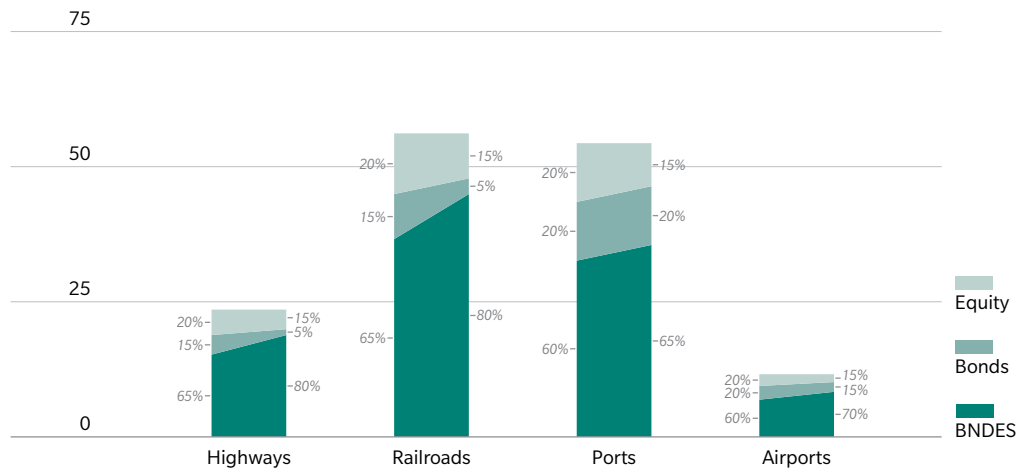
PERCENT OF CENTRAL GOVERNMENT EXPENDITURES PER YEAR



Note Loans to BNDES do not come directly from the government's budget and do not impact net debt. We have, however, added up all of the government's direct funding needs linked to the infrastructure program as a percentage of the budget for the sake of comparison
Source BNDES, Brazil Ministry of Finance, ItauBBA, Oliver Wyman analysis

EXHIBIT 5: EXPECTED CAPITAL STRUCTURE FOR INVESTMENTS IN TRANSPORTATION

R\$ BILLION

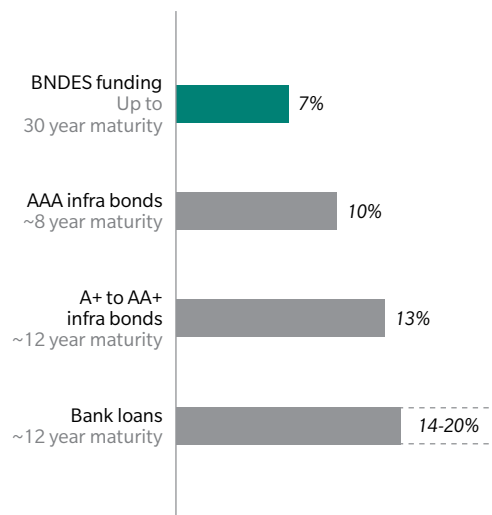


Source BNDES

While such schemes are a positive sign, the government will need to do more to incentivize private long-term funding that is competitive with government funding. For example, recently issued infrastructure bonds are paying an average of ten percent for AAA bonds and 14 percent for AA-. Bank loans for infrastructure have a lower maturity and rates tend to vary between 13 and 20 percent.¹⁵ Both alternatives represent a higher cost for infrastructure compared to BNDES loans, which are being provided at up to seven percent and longer maturity (Exhibit 6). At the same time, the Brazilian government funds its own long-term commitments, like infrastructure funding, mainly with inflation-indexed bonds at ~12 percent, which provides long-term investors with a comparatively better investment opportunity than higher-risk infrastructure investments.

The impact of this situation can be seen in the case of Brazilian pension funds, which could be key investors in infrastructure, as their investment goals are long-term, and infrastructure assets can naturally provide the inflation and maturity hedging they require. Currently, these funds invest a limited fraction of their portfolios in infrastructure, but hold over a third of all government-issued inflation-indexed bonds, as shown in Exhibit 7.¹⁶ A similar logic applies to insurance companies that offer private pensions and life insurance. These held assets of R\$111 billion in 2011 and premia have grown over 15 percent in the 4 years since 2007.

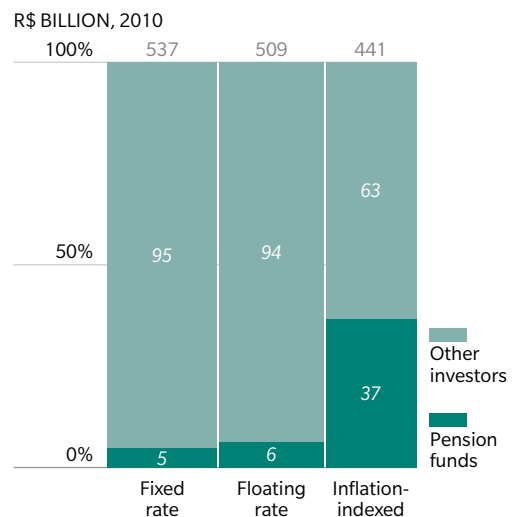
EXHIBIT 6: FUNDING COSTS FOR BRAZILIAN INFRASTRUCTURE PROJECTS



Note Focus is on bonds issued under Article 2 of Law 12,431. Bonds data as of November 2013

Source Oliver Wyman analysis, Anbima, bank industry expert interviews

EXHIBIT 7: DISTRIBUTION OF GOVERNMENT BONDS BETWEEN PENSION FUNDS AND OTHER INVESTORS



Note Fixed rate bonds: L trillion and NTN-F; floating rate bonds: LFT; inflation-indexed bonds: NTN-B and NTN-C

Source Brazilian Central Bank, Anbima

¹⁵ Anbima and interviews with market participants. Ratings follow the local scale.

¹⁶ Banco Central do Brasil.

To a large extent, the Brazilian government presently acts as an intermediary between long-term investors and infrastructure funding, and thus plays a key role in determining the attractiveness of funding and investment opportunities. In the future, replacing the government as the guarantor of funding and risk mitigation will be essential to increasing private investment in the sector. If within the next 10 years, for example, approximately R\$60 billion were invested in infrastructure by long-term funds and other private investors instead of the government, this would reduce fiscal transfers from the Brazilian Treasury equivalent to 1.6 percent of GDP (an average of ~R\$8.5 billion per year).

Increasing the participation of private investors will require matching the investment needs of potential investors to the funding needs of infrastructure projects, allowing equity holders to offer better risk-adjusted returns for debt holders without jeopardizing project viability. A better risk-adjusted return for the private sector can be obtained either through more efficient project and risk management that leads to project de-risking or via government subsidies. More efficient risk sharing that takes into account the comparative advantages of each investor type also can positively impact private funding. In the next section, we analyze the main drivers of infrastructure funding costs and the main sources of risk for various types of investors.



THE ROLE OF BANKS

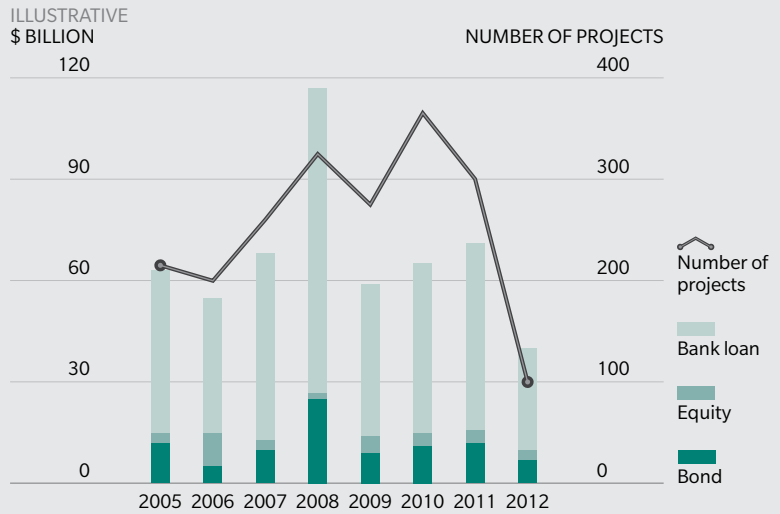
In many countries, banks have long been a major source of long-term funding. After the recent global economic crisis, however, together with the introduction of Basel III, many banks are dealing with severe profitability issues and harsher liquidity requirements that may limit their ability to fund infrastructure in the future.

In Brazil, banks have focused on bridge loans and/or other short-term loans, with BNDES providing long-term funding and debt. Banks are the main providers of guarantees to BNDES, but their high funding costs make it nearly impossible to follow the European model of infrastructure funding. Looking at international markets, post-Basel III investors such as insurance companies and pension funds can provide funding to infrastructure projects at a much lower cost due to their long-term, inflation-indexed liability profiles.

Major impediments to increasing bank participation in Brazil include:

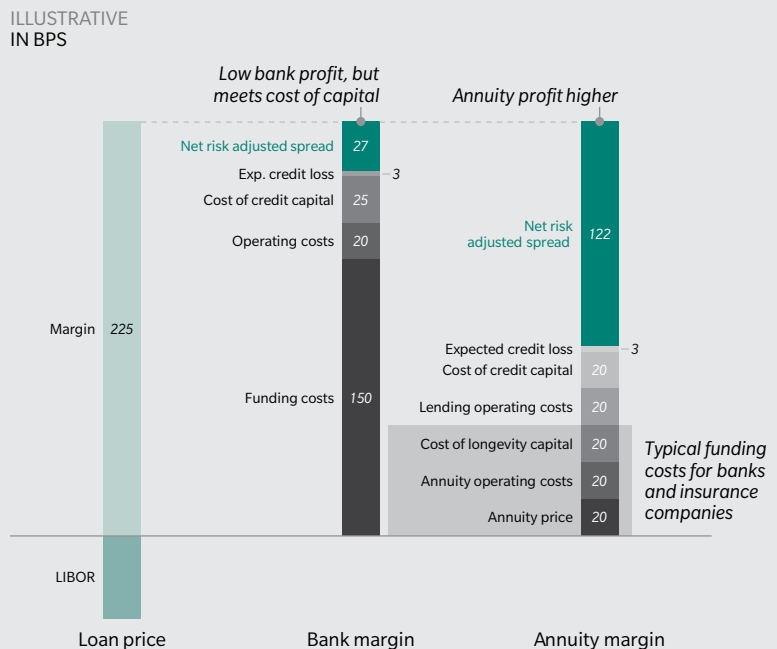
- Lack of market maturity: Brazil has seen several waves of infrastructure investment in past decades, each with their own focus and regulation. This lack of continuity has not allowed the market to properly mature its own rules and regulations.
- Restrictions on long-term investment: Limited availability of long-term funding structures creates a large maturity mismatch and increases funding costs. Harsher capital and net stable funding ratio (NSFR) rules through Basel III will impose even greater pressure on banks' ability to provide long-term funding.
- Uncertain recovery procedures in cases of default: There is a lack of structured mechanisms to protect debt investors in cases of default or bankruptcy of infrastructure projects.

EXHIBIT 8: EUROPEAN PROJECT FINANCE VOLUME BY SOURCE OF FUNDING



Source Freshfields Bruckhaus Deringer, Outlook for infrastructure 2012

EXHIBIT 9: SPREAD BREAKDOWN BETWEEN BANK FUNDING OF A SOCIAL HOUSING LOAN AND UK ANNUITY FUNDING, POST-BASEL III



Source Oliver Wyman analysis

II. INFRASTRUCTURE INVESTMENT AND THE PRIVATE MARKET

While Brazil attracts direct investment in infrastructure, a market for private debt is necessary to reduce the need for government funding of infrastructure. The maximum leverage proposed by the Brazilian government for new infrastructure concessions is between 60 and 85 percent as debt, in line with the international market, and close to the target of 70 to 80 percent suggested by most market participants in Brazil.

Brazil has recently established new regulations for investment in private infrastructure bonds, which at the moment are tax-free. Thus far, bonds issued since 2012 through this initiative represent less than 0.5 percent of the Brazilian debt securities market, or approximately US\$2 billion.¹⁷ Despite the high liquidity of some of these bonds, Brazil's bond market is at a relatively early stage compared to other international markets.¹⁸ In the United States, for example, one of the biggest markets for infrastructure bonds, tax-exempt municipal bonds are a key tool for funding projects, with outstanding values of approximately US\$3 trillion for infrastructure-focused bonds. This volume is equivalent to eight percent of the US debt securities market.¹⁹ In Canada, outstanding infrastructure bond value totals more than US\$45 billion, which represents over 40 percent of all corporate bonds with a 10-plus year maturity.²⁰

When comparing credit spreads, Brazilian bonds pay a risk premium that is in line with those of other countries (Exhibit 10). If, however, we compare the interest paid on infrastructure bonds to equivalent inflation-indexed government bonds, this appears low when additional risks are taken into account (Exhibit 11). The bonds issued under Brazil's new regulation have ratings between AAA and A+ following the local rating scale, and all but one are inflation-indexed, with rates between three and nine percent per year.

¹⁷ Anbima.

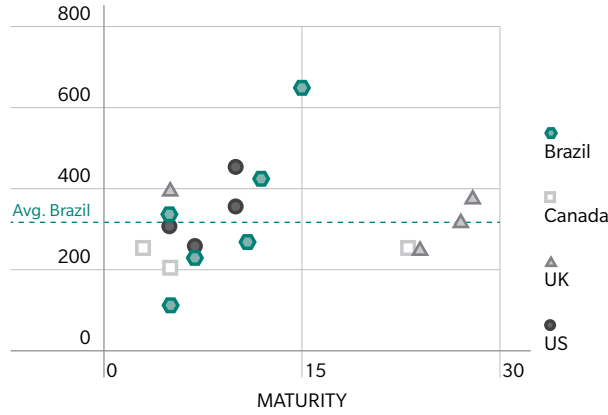
¹⁸ Some of these bonds had a turnover in the first 90 days of 100 percent or more over issued volume.

¹⁹ MacKay Shields, BIS.

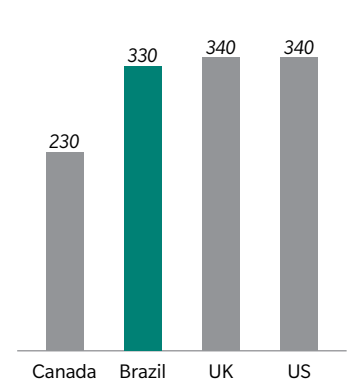
²⁰ BIS, Normandin Beaudry.

EXHIBIT 10: INFRASTRUCTURE BOND SPREAD COMPARISON, BPS OVER LOCAL INTERBANK LENDING RATES – SELECTED HIGHWAY DEVELOPMENT PROJECTS, 2009 – 2013

SPREADS VS. MATURITY BY PROJECT
SPREAD IN BPS



AVERAGE SPREAD BY COUNTRY
SPREAD IN BPS

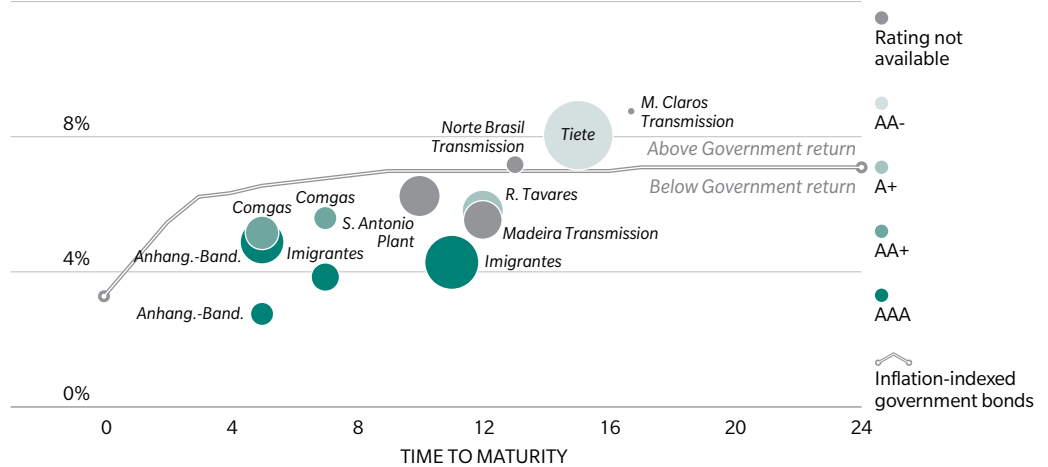


Note For Brazil, focus is on bonds issued under Article 2 of Law 12,431. Data as of November 2013. Spreads are calculated over local LIBOR rates of CDI (Brazil)

Source Anbima, Dealogic

EXHIBIT 11: SPREAD COMPARISON BETWEEN INFLATION-INDEXED INFRASTRUCTURE AND BRAZILIAN GOVERNMENT BONDS – SPREADS OVER IPCA INFLATION INDEX

INTEREST RATE
12%

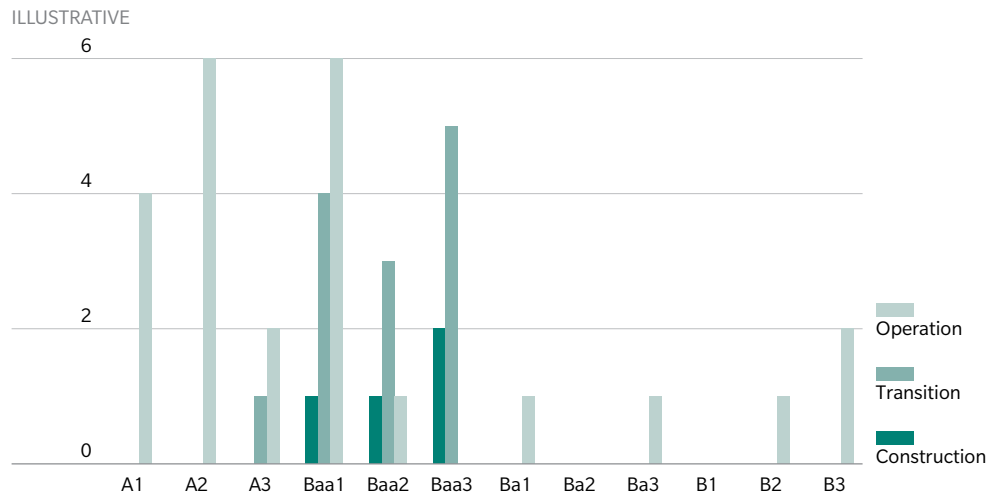


Note Focus is on bonds issued under Article 2 of Law 12,431. Data as of November 2013 for government bonds. Given limited information or trades, we have considered infrastructure bond rates and maturity at issuance. Most of these bonds were issued in 2013, except for five that were issued in the second half of 2012

Source Anbima, Brazilian Central Bank

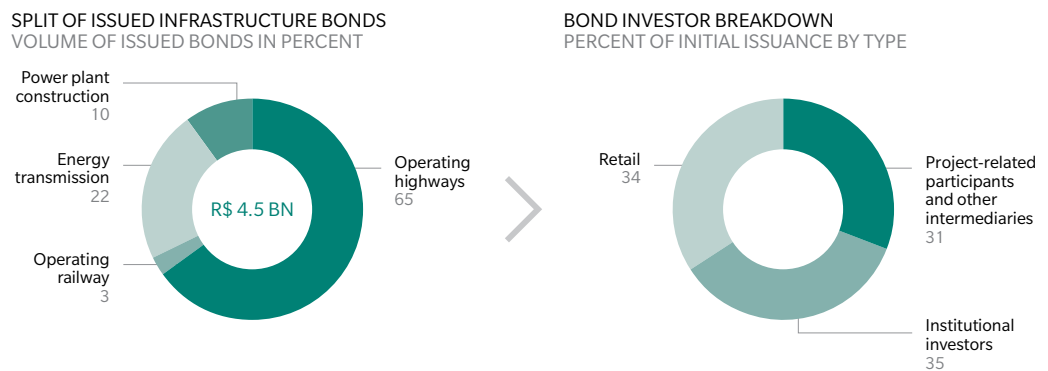
The evidence suggests that only projects with relatively low risks are accessing the Brazilian infrastructure bond market. In general, bonds linked to projects with uncertain or volatile cash flows are riskier and more costly to issue. Greenfield projects tend to have a lower rating (although higher returns) than brownfields, and the more certain the cash flows become during a project's lifetime (construction, transition, operation) the higher the rating will rise as the risks associated with construction and completion drop off (Exhibit 12). Indeed, as Exhibit 13 demonstrates, most bonds are issued for operating highways, which produce stable cash flows in the short term.²¹ At present, there appears to be relatively little appetite for high-yield, high-risk bonds (or the extra risk associated with the construction phase). Importantly, many institutional investors face strict regulations that limit their investment in high-yield bonds.

EXHIBIT 12: RATING DISTRIBUTION BY PROJECT PHASE – EMEA



Source Freshfields Bruckhaus Deringer, *Outlook for infrastructure 2012*

EXHIBIT 13: BREAKDOWN OF BRAZILIAN PROJECTS THAT HAVE ISSUED INFRASTRUCTURE BONDS



Note Focus is on bonds issued under Law 12,431, which regulates tax incentives for infrastructure bonds. Data as of November 2013

Source Oliver Wyman analysis, Anbima

²¹ Additionally this is a more mature market, as the first concessions for federal highways date from 1995.

TO WHAT EXTENT WILL BRAZILIAN INFRASTRUCTURE PROJECTS BE ABLE TO ISSUE INFLATION-INDEXED BONDS?

The success of a market for medium/long-term infrastructure bonds will depend on whether projects are able to issue a significant volume of inflation-indexed bonds. As funding ultimately will be paid by a project's cash flows, the amount of inflation-indexed bonds that can be issued will be directly linked to the extent to which cash flows are inflation-indexed. Prices and their subsequent increases are generally defined when concessions are auctioned. Nevertheless, there are several risks regarding current regulation that can decrease a project's capacity to issue bonds:

- Change in price adjustment methodologies: The energy sector regulator, for example, reviews energy tariffs every four years, on top of agreed yearly inflation corrections. The resulting adjustments might not match companies' needs or expectations.
- Disconnect between chosen indices and real costs: Fluctuations in specific cost drivers such as oil prices and construction may not be reflected in common consumer price inflation measures.
- Impact of quality-related penalties: Price methodologies in railroad and airport concessions, for example, have quality/productivity drivers. If standards are not realistic, they can heavily impact future adjustments.
- Public perceptions: Public concerns can have a significant impact on the ability to adjust prices to inflation.



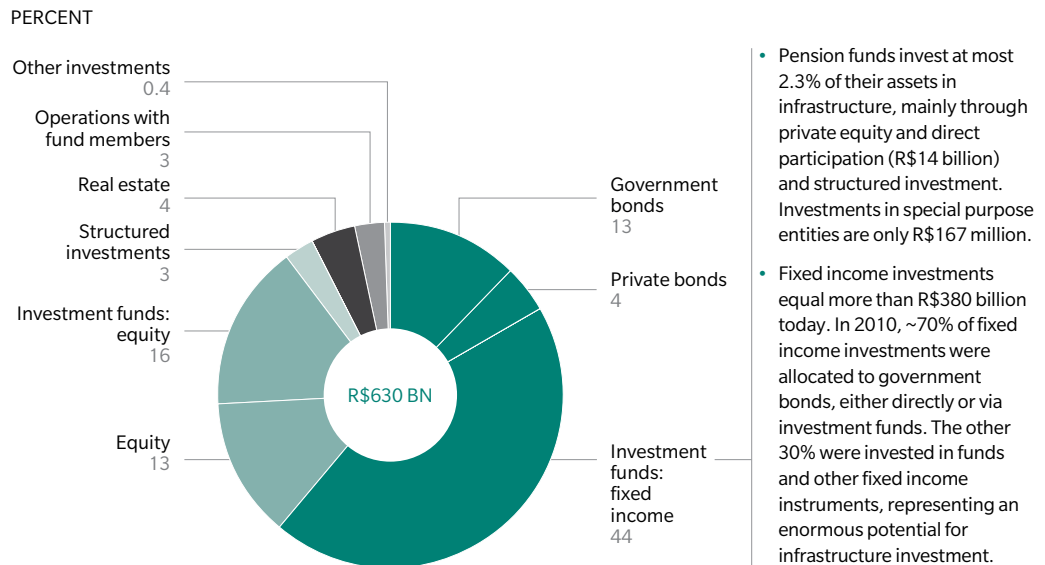
PRIVATE INVESTMENT CHALLENGES

Long-term funding requires long-term investors. In Brazil at the moment, there are only a few such sources available to help fund infrastructure projects. Pension funds and insurance companies, as noted previously, have long-term liabilities usually linked to inflation, and thus infrastructure investment could provide them with long-term assets, hedging both their inflation risk and the duration of their liabilities, in addition to providing portfolio diversification.

As suggested by the example shown in Exhibit 9, long-term investors have lower funding costs, and can extract greater profit from long-term investments than banks, particularly under Basel III rules. Despite these incentives, however, pension fund investments in infrastructure have been limited to date: It is estimated that less than one percent of pension fund assets worldwide are invested in infrastructure projects (either via debt or equity),²² and less than two percent of pension fund assets in Brazil are so invested (Exhibit 14).²³

In addition, the size of a fund will determine the types of investments it tends to make: Larger funds tend to be over-represented in infrastructure investment, as they have the capacity and scale to fund analysis costs and build specific in-house expertise, but they normally invest directly. Medium-sized funds may have dedicated teams for infrastructure, and often invest by pooling resources in private equity funds. Smaller pension funds that cannot support the cost of infrastructure investment analyses invest mainly in simpler fixed income instruments, which may represent ~90 percent of their assets under management.

EXHIBIT 14: BRAZILIAN PENSION FUNDS' PORTFOLIO ALLOCATION, 2013

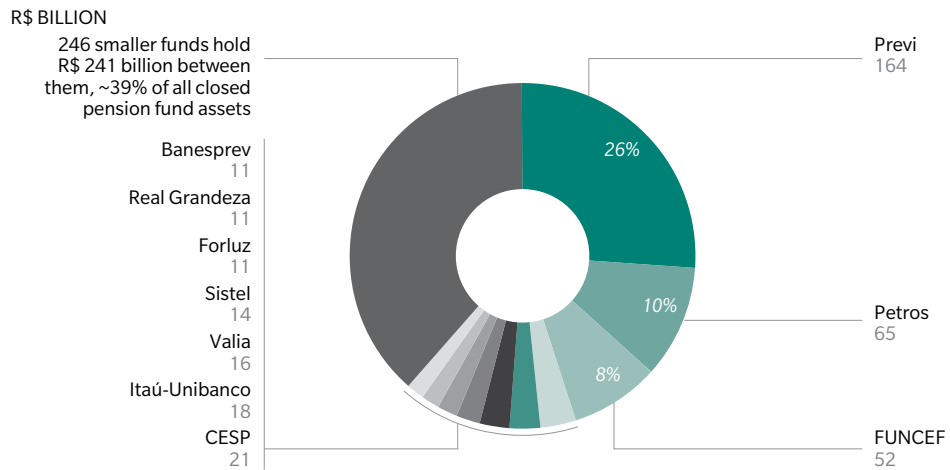


Source *Relatorio de Renda Fixa*, Anbima, July 2010; ABRAPP, June 2010 and 2013; Oliver Wyman analysis

²² *Pension Funds Investment in Infrastructure*, Oliver Wyman and OECD, 2011.

²³ Banco Central, Oliver Wyman analysis.

EXHIBIT 15: CONCENTRATION OF THE BRAZILIAN PENSION FUNDS MARKET



Source ABRAPP, June 2013

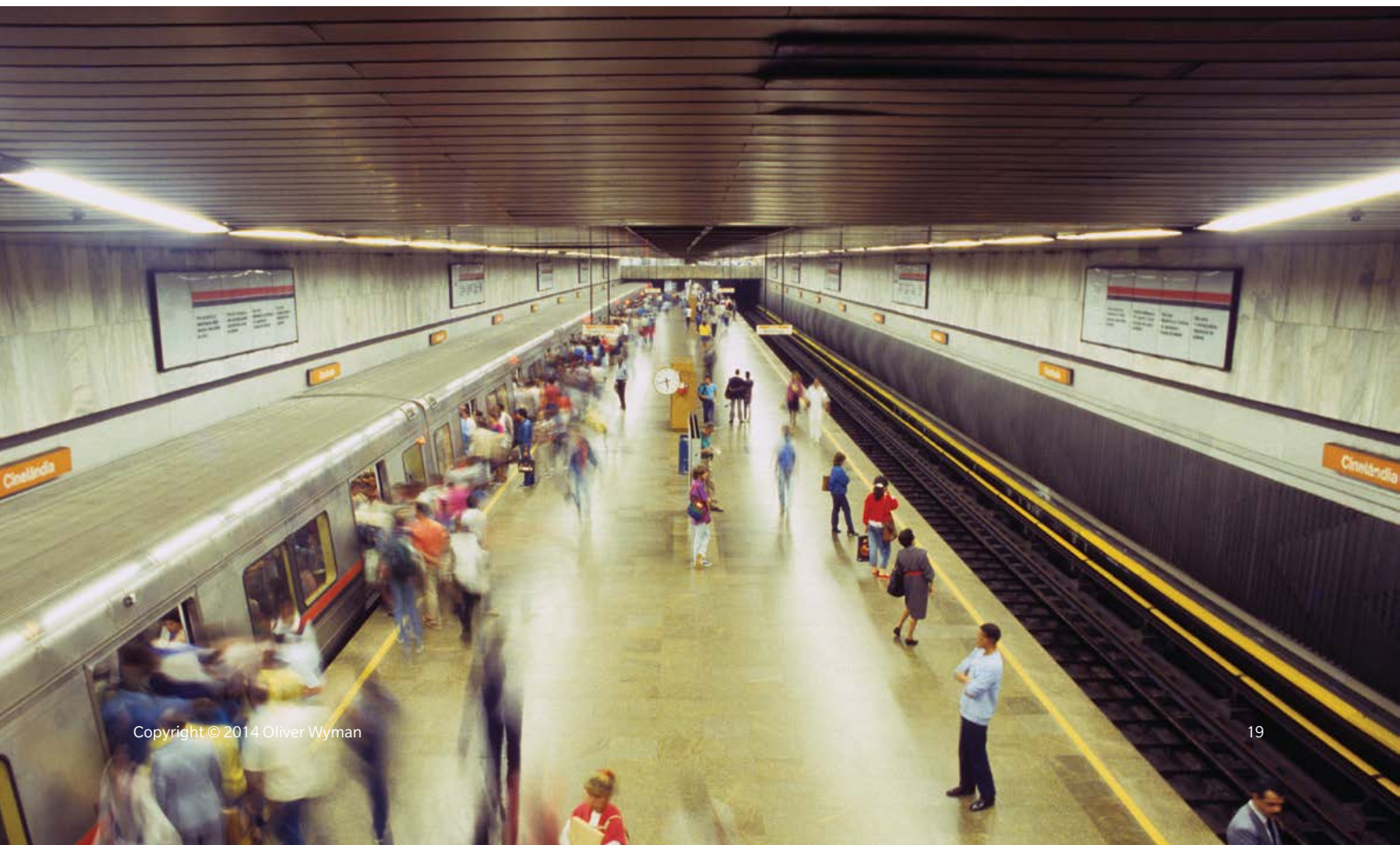
The concentrated nature of the pension fund/insurance market in Brazil – a few large/ mid-sized companies and several smaller ones – and the fact that larger funds invest mainly directly or via participation in private equity companies may play into the limited interest in infrastructure bonds to date. Other potential factors impacting pension fund interest in infrastructure bonds may include the following:

- **“Crowding out” by government bonds:** Comparatively, high-yielding government inflation-indexed bonds can make investment in infrastructure bonds less attractive from a risk/return standpoint. As pension funds are tax exempt, the tax exemption that retail investors receive for infrastructure bonds does not mitigate relative returns, making this comparison particularly disadvantageous for pension funds.
- **Perceived risk:** Historically, there is a perception of higher risk for infrastructure investments in Brazil, which is compounded by changes in regulations, a lack of transparent or accessible indicators and benchmarks and a clear framework for risk mitigation, insurance mechanisms, and ratings. This issue is particularly relevant for mid-sized and small pension funds that have limited expertise in the sector.
- **Credibility of the current bond credit rating system:** The 2008 financial crisis revealed a lack of transparency on rating methodologies. As shown by the Chilean system, this is particularly important for smaller pension funds that generally do not have enough scale to develop the know-how and specialized teams required for investing in infrastructure.
- **Size of the private bond market and lack of secondary market activities for private equity investments:** As pension funds move to a defined (or variable) contribution system in which investors are allowed to withdraw their funds at any time, liquidity management becomes an issue. Given that private equity investments are usually locked in for long periods and that the bond market is limited, it can be unfeasible to have significant portfolio allocation in infrastructure.

In addition to pension funds/insurance companies, other key players are needed to make the market for infrastructure. Asset management and private equity funds provide smaller pension funds and retail investors with the opportunity to invest in the infrastructure sector. These funds can provide the analytical and decision making capabilities that potential investors lack regarding the infrastructure market, and the availability of these types of funds is crucial for the expansion of infrastructure products, such as infrastructure bonds and securitization instruments.

For these types of investment funds, however, the current risk/return levels of infrastructure project long-term debt are not attractive versus available alternatives such as government bonds. The problem is compounded by the high cost of analysis and legal responsibility, which is not fully reflected in bond prices. In addition, these funds are hampered by the limited size of the infrastructure bond market and the restricted nature of the secondary market.

Private equity funds have been increasingly active in the Brazilian infrastructure segment. Their equity stakes expose them to a wide range of risks, however, from project licensing, where the processes for approval are opaque and overly long, to construction and operating risks that can directly affect profitability (e.g., changes in input prices and regulations). The more risk equity investors bear, the higher the returns they require, and the less can be offered to debt holders in exchange for the risk that bonds carry.



INCREASING PRIVATE INVESTMENT IN INFRASTRUCTURE: COUNTRY EXAMPLES

A number of other countries have faced the issue of increasing pension fund participation in infrastructure. A few examples include the following:

COUNTRY	LESSONS LEARNED
AUSTRALIA 	<ul style="list-style-type: none"> • Infrastructure investment funds: The emergence of investment banks and asset managers has been key to supplying an investment vehicle for pension funds, especially those with less scale. • Infrastructure experience/maturity: As pioneers in infrastructure investment, Australian pension funds have expertise and know-how that reduces the perceived risk of infrastructure projects. • Project structuring: Excessive leverage and overestimation of project returns led to many funds experiencing difficulties.
CANADA 	<ul style="list-style-type: none"> • In-house expertise: Canadian pension funds have acquired the experience and know-how to invest directly in infrastructure projects, representing a considerable asset in terms of risk assessment capabilities. Their model saves on investment fees in the long-run but may require scale, as it is the bigger pension funds that invest the most in infrastructure (in percentage terms). • Infrastructure as a separate allocation: Canadian pension funds have created separate asset allocations for infrastructure, with the objective of hedging inflation. This has driven further specialization in infrastructure projects.
GERMANY 	<ul style="list-style-type: none"> • Use of technology to increase cash flows: Technology can be used to help disseminate pay-per-use schemes for infrastructure. In Germany, for example, technology allows trucks to be charged tolls in proportion to the number of kilometers driven, the size of the vehicle, and the volume of emissions. Revenues from this scheme are used for infrastructure development. This type of mechanism can help increase the number of users paying for infrastructure, allows for better cost distribution, provides good incentives for road users (e.g., lower-emission vehicles), and can help determine the potential for expansion as well as the needed level of subsidy. In Brazil, it is estimated that less than 10 percent of vehicles that use the highway between Rio de Janeiro and São Paulo pay tolls.
MEXICO 	<ul style="list-style-type: none"> • New vehicle for investment: Created in 2009, Structured Equity Securities (CKD) are offered on Mexico's stock exchange to finance private equity funds or projects dedicated to specific types of investment (e.g., infrastructure). From 2009 to 2011, 18 CDKs were issued, with ~US\$3.0 billion in proceedings. • Regulatory changes: CDKs were made available through changes in Mandatory Pension Fund (Siefore) investment rules, allowing investments in infrastructure projects and private equities, which were previously banned.
UNITED KINGDOM 	<ul style="list-style-type: none"> • Use of guarantees: Announced in July 2012, the UK Guarantees Scheme was launched with the aim of kick-starting critical infrastructure projects that are struggling to obtain funding through traditional sources. Guarantees are offered at market rates and assure private lenders that they will receive their money back if projects are unsuccessful.

III. THE WAY FORWARD: OPTIMIZING INFRASTRUCTURE INVESTMENT

Solving Brazil's infrastructure gap and attracting private investors to help do so will require the continuing development of a sustainable framework for investment – one that emphasizes process transparency, suitably assesses and manages risks, and offers viable roles and appropriate returns for each class of private investor.

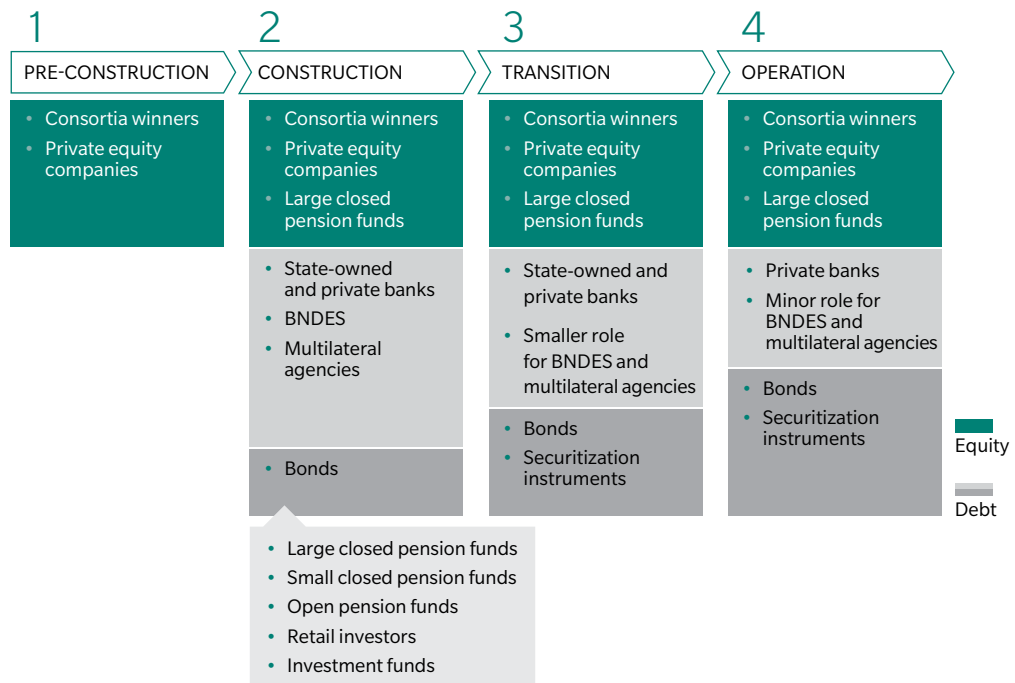
Banks, institutional investors, and retail investors have different needs as well as different risk appetites for infrastructure projects. Risk-taking capacity will depend not just on the structure of their balance sheets, but also on the access they have to information. While banks, private equity and insurance companies, and large pension funds have enough scale to develop capabilities in this area, other investors do not, and can find the process of getting access to information too costly. In addition, infrastructure projects will have different risk profiles depending on the phase, sector, or even region where they are being developed. As a result, as the market develops, different risks along the value chain should be efficiently allocated to the investors best suited to handle those risks (Exhibit 16).

For example, although BNDES may fund up to 80 percent of infrastructure projects, banks usually provide guarantees and absorb credit risk. Banks also provide bridge loans between a project's loan approval at the development bank and the actual release of funds. They are also major buyers of recently issued infrastructure bonds. Banks already have the capacity to take the bulk of the risks that other investors might be unwilling to bear. Yet, their costs linked to long-term funding can be high, and will likely increase with the advent of Basel III.

Once Brazil's market for infrastructure projects deepens, a natural solution would be to have banks concentrate on short to medium-term debt (i.e., fund projects during construction and transition phases) with securitization of loans when the operating phase has been reached. The costs of their funding may need to be reduced to make such a process viable, but certainly more efficient structuring of debt and better risk management could reduce the need for BNDES' participation.

Similarly, pension funds could play a fundamental role in providing liquidity to the market. Although they cannot provide the sole solution to infrastructure funding, their contribution as long-term credit investors will be important as Brazil moves to a more privately funded investment structure. As the market deepens and the awareness of infrastructure as an asset class increases, pension fund involvement can bolster the viability of bonds for a broader range of projects. This will also impact the number of projects being funded privately, which is key to using the securitization mechanisms already available in the market, and ultimately to broadening the market. The further use of securitization is particularly important as a means of increasing the participation of smaller pension funds, as risks are thereby diluted.

EXHIBIT 16: EXAMPLE OF AN EFFICIENT FUNDING STRUCTURE



Market development will not preclude government participation, as some types of projects will always require subsidy. But the government’s role can be optimized, and with successful market development, likely reduced over time.

In the short run, initiatives could be undertaken to avoid interruptions due to budgetary constraints. Schemes that could provide further protection to infrastructure bond holders would be particularly valuable. One option could be to increase the participation of multilateral agencies, as these institutions have strong control mechanisms that improve project risk perception and are able to access a different pool of investors (particularly internationally). Alternatively, initiatives that promote the tranching of debt in different risk segments could help access investors quickly, particularly if the safer tranche offer guarantees.

Our final recommendations reflect the broad consensus of market stakeholders across the entire chain of infrastructure investment: Planning, execution, supervision, and funding. Although each recommendation, if implemented, can have standalone impact, a holistic approach is most likely to optimally increase private investor interest in the Brazilian infrastructure market.



OPTIMIZE THE FINANCIAL STRUCTURE

A project is most feasible if it offers a suitable risk-adjusted return for all stakeholders. The key is determining how to split revenues and risks between debt and equity holders to satisfy their minimum requirements. An efficient financial structure can optimally allocate risk and return among investors, enhance credit, and potentially increase access for alternative investors in the market.

Credit enhancing initiatives can unlock capital currently not available for infrastructure investment and can significantly decrease the need for public funds. Success will, however, require an expert capacity for project valuation and solid risk management from the institution that holds the subordinated debt or that provides insurance.

DEBT TRANCHING

Structuring of debt into distinct risk tranches can be an important credit-enhancing initiative and has the potential to unlock significant capital. This mechanism allows for more efficient risk sharing through the allocation of risks between senior, highly rated debt and subordinated debt that would absorb residual, non-insurable project risk.

Debt structuring is being tested by the European Investment Bank as a means for kick-starting an infrastructure bond market (see page 25). The EIB takes mezzanine debt tranches of up to 20 percent of the financed debt structure. In the case of the loss of all equity, the EIB would take the first 20 percent of debt losses. This role is also effective for banks under Basel III and offers maximum debt and equity investor participation.

The adoption of such mechanisms can have an impact in the short-run, but involves sharing guarantees already in place between the different debt holders. In Brazil, at the moment, BNDES has access to several guarantees, but bond holders have very limited guarantees. Indeed, of the infrastructure bonds issued recently, 80 percent have no guarantees.

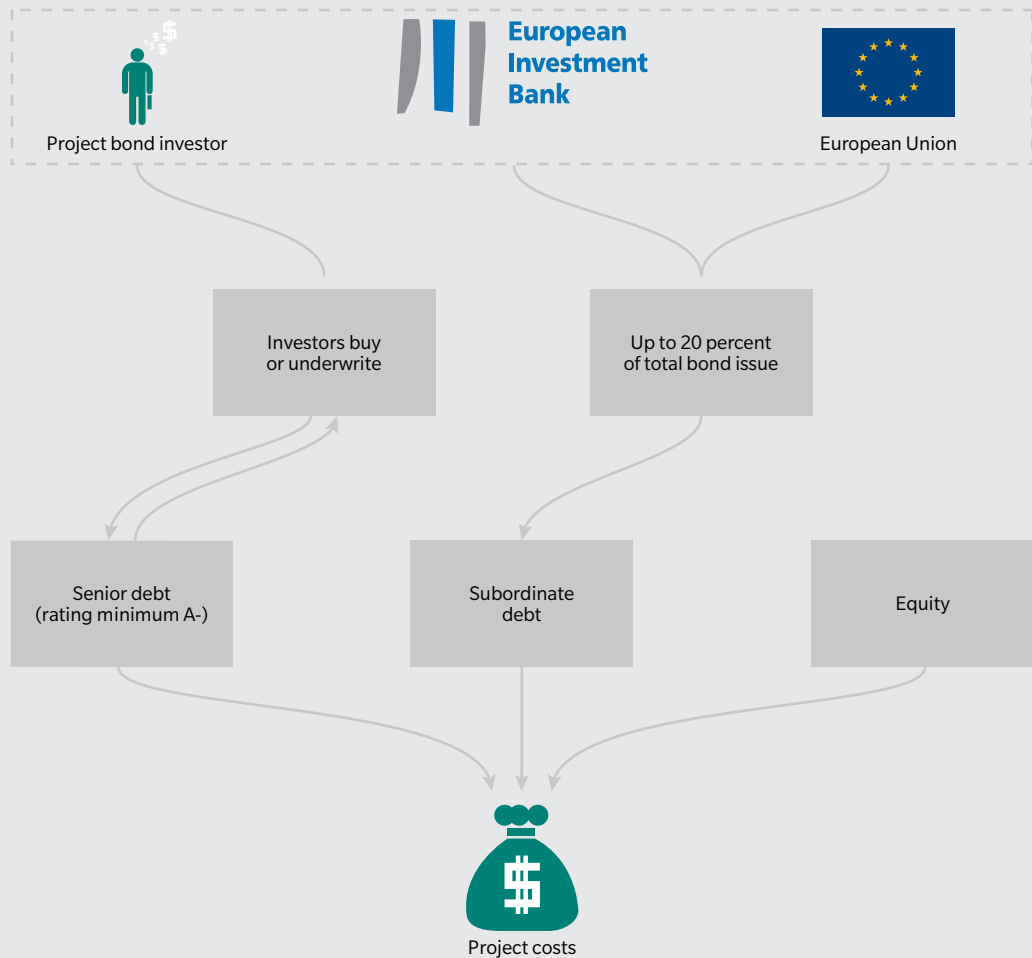
CASE EXAMPLE

EUROPE 2020 PROJECT BOND INITIATIVE

The EIB will credit enhance up to 20 percent of project debt, meaning it will take, after the loss of all equity, the first fifth of debt finance losses relating to a project. The debt is split into two tranches: A senior tranche with an A rating and a subordinate tranche with a BBB rating. The first is sold in the market, while the latter is financed by the EIB.

In Brazil, the adoption of a similar alternative would be beneficial, but would also mean a new role for BNDES, as it would assume the higher risks associated with the subordinate debt guarantee. This structure, however, is more appropriate for banks under Basel III, due to increased restrictions on leverage ratio.

EXHIBIT 17: DEBT STRUCTURING EXAMPLE



BOND INSURANCE

Another credit-enhancing option is to attach insurance to infrastructure bonds. Until the 2008 financial crisis, monoline insurers provided insurance for infrastructure bonds. The arrangement guaranteed interest and principal repayment in case of default, bringing the rating of the bonds as high as possible (AAA).

Through the use of securitization, monolines were able to provide an AAA rating at a lower cost than the special purpose entity (SPE) running the project. As monoline companies absorbed all the risk, insured bonds did not suffer from the asymmetry of information that usually affects infrastructure projects and would attract capital that was not originally available. Monoline insurers were also responsible for deal structuring and monitoring and acted as controlling creditors, decreasing costs for both bond issuers and buyers.²⁴

Monolines were introduced in the United States in the 1970s and had a significant impact on infrastructure funding. In Chile, monolines were introduced in the 1990s and were a key component of the government's efforts in bridging a significant infrastructure gap. Until recently, 100 percent of Chilean infrastructure bonds with issues of at least US\$40 million, and 97 percent of all infrastructure bonds were insured by American monoline companies.²⁵ Today, Chile has one of the most developed markets for infrastructure investment in Latin America due, to a great extent, to the use of monoline insurance.

The demise of the monoline industry during the global financial crisis of 2008 was unfortunate and not based on their core business. This mechanism can, however, have a significant impact in bringing new capital into the infrastructure market. Its use has also shown that securitization, if properly structured, can be a powerful diversification tool and risk-sharing instrument and that risk mitigation can positively impact infrastructure development.

In Brazil, non-manageable risks can have a significant impact on costs (see below) and attaching insurance to infrastructure bonds can quickly expand private participation in infrastructure. This structure cannot ignore the important role that monolines had as controllers, however, as otherwise it could lead to an increase in moral hazard.

²⁴ *Outlook for infrastructure 2012*, Freshfields Bruckhaus Deringer LLP.

²⁵ *Revista de Economía Institucional*.

OPTIMIZE THE TRANSFER OF SUBSIDIES

Any infrastructure investment will ultimately be paid for by the users, taxpayers, or a combination thereof. In the concession system currently proposed, cash flows generated by users will go straight to the operator, while a significant portion of the funding will be subsidized by the government via BNDES.

Given the government's limited resources and the large volume of infrastructure investment required, subsidies need to be precisely assessed on a cost-benefit basis. Subsidies must be structured so as to limit abuses and ensure that private funding is not crowded out. At the same time, the structure should not reduce the government's capacity to fund high-cost, high-externality projects that could not be executed otherwise.

There is also a need for transparency on the costs and benefits for the government and how subsidies are apportioned between projects. A proper cost-benefit analysis will require a thorough and transparent public project viability assessment process, an assessment of the actual need for government funds, and a comprehensive analysis of the externalities that could be generated. A clear valuation of total subsidies should be included in the annual budget. Many countries have found this to be an effective process, as deferral creates opacity and reduces fiscal flexibility.

Subsidies can be provided through various channels. In Canada, the government guarantees both interest and principal for projects that are past the construction period. This scheme works as a form of insurance, which is generally cheaper for the government than providing a direct subsidy, as public funds are only required when there are delays. In Chile, Minimum Revenue Guarantee contracts are such that the government guarantees minimum revenue for the project. If subsidy payments exceed a certain threshold, the government receives equity participation in the project. This arrangement helps align incentives and decreases the probability of abuse.

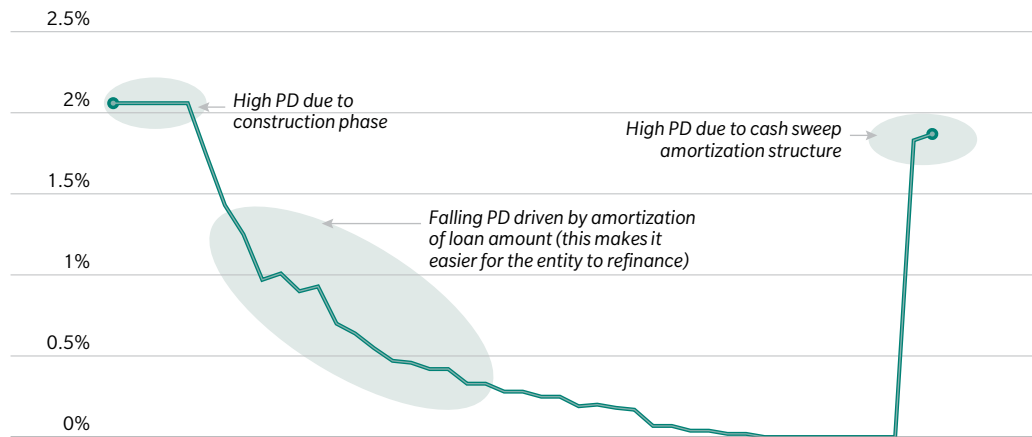
OPTIMIZE RISK MANAGEMENT

A thorough and efficient risk management process is essential to guaranteeing the highest possible credit rating for the project and lowest cost of capital. Managing risks within infrastructure projects is challenging, as these can be complex, diverse, and not always quantifiable. The problem is amplified by a difficult investment environment with large upfront disbursements, long amortization cycles, and uncertain cash flow timing.

De-risking requires a well-defined, step-by-step process for identifying, analyzing, and mitigating risk. The different perspectives of the parties in the deal (governments/sponsors vs. investors/lenders vs. construction/operators) should be reflected in determining risks. Managing risks requires the definition of specific roles and accountability to guarantee a decrease in actual as well as perceived risks.

EXHIBIT 18: PROBABILITY OF DEFAULT ACROSS PROJECT LIFETIME

ILLUSTRATIVE



Source Oliver Wyman analysis

In Brazil, most assessments of a deal's risk are done using scorecards. However, given the lack of precision of long-term cash flows (from a back-to-back lack of transparency), there is a clear benefit to using more sophisticated models that could simulate those issues and directly incorporate the dynamics of the probability of default over a project's lifetime (see Exhibit 18 and sidebar on page 29).

Effective risk management should also ensure transparency in construction and that appropriate capabilities are being harnessed. Infrastructure investment requires a significant amount of labor, both skilled and unskilled, and equipment that may not be readily available. As the number of projects developed in the country increases, there needs to be improved transparency of project management and delivery, drawing on specific expertise in relevant industries, and appropriate monitoring to guarantee that projects are not jeopardized by a lack of construction capacity. Transparency in planning lowers the probability of unintended interruptions that can significantly increase costs and cause delays.

Finally, while valuation and risk analysis generally get significant attention on a project-by-project basis, transparency on a cross-portfolio level tends to be much less robust. For investors, a key issue is to evaluate the marginal impact of a new project on the portfolio, as this provides a more accurate measure of the risk-return ratio of the whole investment portfolio and improves forecasting ability. Moreover, this procedure supports de-risking efforts by efficiently concentrating on projects or assets that are the most critical to portfolio-level success.

CASE EXAMPLE

CASH FLOW SIMULATION AND PROJECT RISK MANAGEMENT

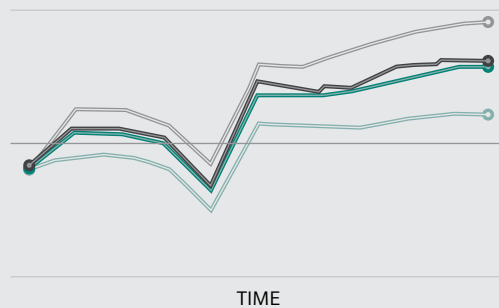
Estimating project cash flow can be done using scorecards or cash flow simulation models. Scorecards are typically easier to use, but they do not produce as much granular insight into risk mitigation and dynamic risks as do simulation models, which can replicate profit and loss statements and balance sheets across a project's lifetime. By varying potential changes in key risk drivers, a simulation model can determine project profitability under a range of different scenarios.

As an example, for a US\$5 billion rail and port export channel capacity expansion project, cash flow simulation and risk driver modeling determined that original planned cash flows were too aggressive over the project lifespan: In 70 percent of the scenarios developed, the project's internal rate of return was below the hurdle rate.

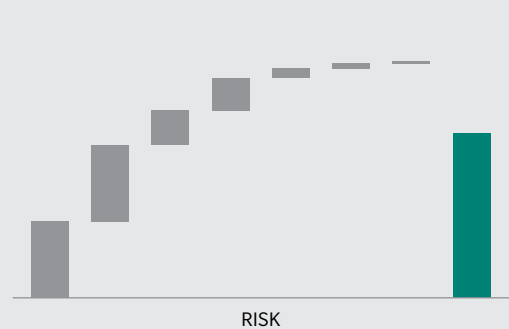
Cash flow simulation was used to map the contribution of each risk factor to final net present value (NPV). A risk mitigation strategy was then developed, which included adjusting areas of management focus over time, establishing a program management office (PMO) to ensure on-time project completion, and redesigning the tariff contract to manage external input price increases.

EXHIBIT 19: EXAMPLE CASH FLOW SIMULATION MODEL

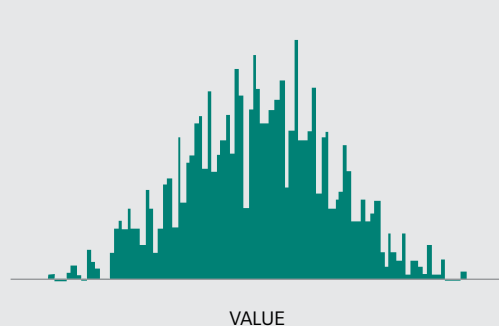
FREE CASH FLOW OVER TIME
VALUE



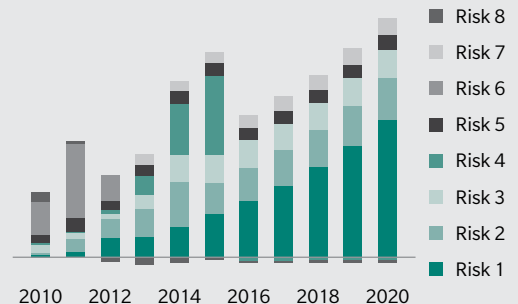
RISK CONTRIBUTION TO NPV



NET PRESENT VALUE DISTRIBUTION



DOWNSIDE RISK CONTRIBUTION VIEW
1:20 CASE



WORK TOWARD MITIGATION OF NON-MANAGEABLE RISKS

The risk management exercise described above not only maps insurable/manageable risks, but also gives a detailed picture of residual risks. Much of the cost of projects comes from non-manageable and/or non-insurable risks. These risks can be legal, regulatory, or involve a lengthy and complex licensing process or lack of clear procedures around default and bankruptcy. Risk perception might even be greater than actual risk, due to a general lack of readily available performance indicators.

Many risk mitigating instruments are already available. For example, public-private partnerships developed with multilateral agencies require guarantee funds, which decrease risk perception and increase project attractiveness. These funds can be established by the public sector, but are usually run as a separate entity to avoid risks linked to government intervention.

The Brazilian government has recently announced the creation of an insurance agency, ABGF, to deal with generally non-manageable/non-insurable risks, filling a market gap. This could help transfer risk from investors to the government. Non-manageable risks, however, need to be properly identified and efforts need to be made to assess and, if possible, mitigate them. The true success of ABGF will depend on whether costs linked to excess uncertainty decrease over time. The process needs to be carefully planned so as to not create excess costs for the government. Several key non-manageable risks in Brazil are highlighted below.

LICENSING PROCESS

A lengthy licensing process in Brazil is currently one of the major sources of non-manageable risk. Approval is required from all governmental levels as well as several environmental and indigenous institutions. Processes are not standardized, and there is no limit on how long it can take to complete the process (cases of over 10 years are not unheard of).

This extra layer of uncertainty has a significant impact on costs and project deadlines. According to the Australia Productivity Commission review of the upstream petroleum sector, reducing regulatory approval time for a major oil or gas project by one year can increase the value of its returns by up to 20 percent.²⁶

²⁶ *National Infrastructure Plan*, Infrastructure Australia, June 2013.

A critical examination of the bottlenecks in the licensing system in Brazil should be a priority, to guarantee that the country fully benefits from the next wave of infrastructure investment. Processes need to be standardized across different agencies. This does not require that entities lose autonomy, but they need to work toward unified, streamlined processes where their scope and powers are clearly defined. Permitting processes are a worldwide issue; the World Economic Forum-Oliver Wyman paper, *Infrastructure Investment Policy Blueprint*, recommends that governments appoint a lead agency to coordinate efforts between stakeholders and determine targets and deadlines.

Development and licensing should be transparent not only to investors/concessionaires but to the public as well. Currently, it is not unusual for projects to be interrupted due to pressure from citizens' groups. An effective and comprehensive hearing process is important, as hearings that lack transparency can potentially generate further risks, increasing the probability of disruptions during the construction period.

The expansion of the transit system of the City of Denver in the United States is a clear example of how planning and transparency can help ensure popular approval and avoid disruptions further down the line. The project failed to garner sufficient support when it was first proposed in 1997. Seven years later, however, the transit project won massive public approval, as a result of government efforts to directly engage the public and local businesses in the planning process and to make the benefits clear.

AVAILABILITY OF INFORMATION

Risk perception of non-manageable risks is exacerbated by a lack of readily available indicators to benchmark the performance of infrastructure projects. Scarce information on time to completion, delays, interruptions, etc. limits investor visibility on historical processes, regulation and risks, and increases overall costs due to excess uncertainty. The development and publication of appropriate performance indicators can provide key benchmarks to the market and lead to more precise risk pricing. This information also can be used to monitor risks and contrast companies during the bidding process.

BANKRUPTCY REGULATION

Additionally, the recovery of assets in cases of bankruptcy is still a lengthy procedure, adding to the risk premium required by investors. There are no specialized tribunals and the process is uncertain, even for bondholders. Colombia solved this by ringfencing projects, allocating assets, liabilities, and future cash flows to a single trust administration, which served as the main source of payment, and providing step-in rights to lenders in case of bankruptcy or default.

Another solution would involve bonds that function in a way similar to insurance provided by monolines and that would cut the risk for bondholders. This solution might involve the sharing of guarantees between BNDES and bondholders and could benefit from a solid securitization mechanism.

REGULATORY UNCERTAINTY

Lastly, one of the main issues that deter the providers of long-term capital is the potential lack of continuity in the regulatory framework. As infrastructure investments are long term and are heavily regulated, they are at the mercy of changes in the political environment. In 2003, the World Bank estimated that water companies in Brazil have a “regulatory risk premium” of five percent due to uncertainty regarding future decisions on water concessions. This five percent differential is significant; it results in a 35 percent decrease in sale prices for concessions or, equivalently, a 20 percent increase in water tariffs.²⁷

Regulatory guarantees can decrease this perceived lack of stability, thereby reducing funding costs and paving the way for the development of a pure project finance market with the active participation of long-term investors. Contracts should be designed such that they have a low probability of renegotiation, within a clear regulatory framework that considers the impact of decisions on the long-term investment climate. Regulations should also balance impact on customers and return to investors.²⁸

²⁷ Guasch, J.L., Laffont, J.J., and Straub, S. “Re-negotiation of Concession Contracts in Latin America,” World Bank Working Paper 3011, 27, March, 2003; and World Economic Forum, *Infrastructure Investment Policy Blueprint*, 2014.

²⁸ For further detail on how to mitigate regulatory risks, see the World Economic Forum, *Infrastructure Investment Policy Blueprint*, 2014.

OPTIMIZE THE CAPITAL MARKET

A well-functioning capital market is crucial for efficient capital intermediation between the users and providers of capital. Brazil's capital market, while well developed, appears to be somewhat over-reliant on government bonds, with limited participation of corporate bonds. Increasing demand for infrastructure bonds essentially requires increasing demand for private bonds as a whole. Some opportunities for improvement in this regard are described below.

EFFECTIVE AND TRANSPARENT RATING AND RISK ASSESSMENT MECHANISM

Since the 2008 financial crisis, the effectiveness of rating agencies has been extensively discussed, and there is now a general perception in the market that often ratings do not provide an accurate valuation of risks, hence requiring a review of underlying methodology. Properly formulated, however, ratings are an important mechanism for decreasing information asymmetry and play a central role in complex investments.

It is thus essential to have a proper and trustworthy rating system for infrastructure projects. In Chile, for example, the Chilean Government Rating Committee, which consists of government and private pension fund members, determines which securities are eligible for pension fund investment by scrutinizing the ratings supplied by private agencies.

Transparency also plays a crucial role in ratings. This could require BNDES-funded projects to publish their cash flow models/assumptions, as well as provide access to key underlying data.

INCREASE TRANSPARENCY AROUND TRADES

Easy access to information is an important aspect of any liquid asset market. Statistics on bid-offer spreads, yields, and volume are vital information for investors, particularly for risk management purposes.

In Brazil, Anbima has recently developed the REUNE system, which publishes, four times a day, prices, rates, and volumes (in ranges) of secondary market bond trades. This is an important step in fostering an efficient and more liquid market. Other opportunities for development that could have a critical impact include providing a more in-depth bond-by-bond analysis and making the website more user-friendly across investor segments. In the United States, the information supplied by the Trace system has led to a decrease in trading costs of nearly half and allowed independent brokers to enter the market, increasing competition and liquidity.

Brazil has nearly 100 small brokerage companies that are being stifled by increasing market concentration. As they do not have the balance sheets to buy the issuance and guarantee the distribution, they cannot act as underwriters. (Although many of these companies are already using this market to reposition themselves, contributing to the liquidity of some bonds.) Developing a framework to allow smaller institutions to take a larger role would increase market diversity and liquidity while lowering costs.

OBLIGATE MARKET MAKERS TO MAINTAIN CONTINUOUS PRICING

In some markets, issuing banks are required to maintain continuous pricing for certain instruments, which helps foster liquidity. Market makers in the fixed-income market in Brazil are currently not so obligated.

Market makers can be an important source of liquidity and information and can help deepen the market. In general, they should be required to post bid-ask spreads for a minimum period of time (time-in-the-market) and have a minimum quote frequency. This ensures that even during less liquid times of the trading day, investors are able to trade against a counterparty under predictable conditions. In Brazil, where infrastructure bonds do have market makers, this has helped to sustain the high turnover observed in these bonds.

ALLOW INFRASTRUCTURE BONDS TO BE USED AS COLLATERAL

Clearing houses in Brazil currently do not accept bonds as collateral. Although higher risk is linked to infrastructure bonds, this would be reflected in a larger haircut and would not necessarily impact systemic risk to clearing houses. A more important consideration is the suitability of the systems in use to process bonds as collateral, including value adjustments and updates to the central counterparty throughout the trading day or at least at the end of the day.

INCREASE EDUCATION AROUND INFRASTRUCTURE BONDS

A key takeaway from our interviews with stakeholders in the infrastructure investment market is the lack of information regarding infrastructure bonds and the high level of perceived risk. Educational seminars for investors around a bond issue could decrease the level of asymmetry of information, and support the functioning of the market.

ABOUT OLIVER WYMAN

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