



SDA Bocconi
School of Management

Mobilizing Private Resources for Infrastructure Investment

STARBEI – Programme for Financing
of University Research

Author: Francesca Casalini

Supervisor: Veronica Vecchi

SDA Bocconi School of Management

This report is the results of researches carried by SDA Bocconi School of Management and financed by the European Investment Bank, STAREBEI – Programme for Financing of University Research, within the project “EU Financing Policy in the Social Infrastructure Sectors: Implications for the EIB’s sector and lending policy”.

The research was tutored by Prof. Veronica Vecchi, from SDA Bocconi, and Andreas Kappeler, Guido Bichisao, Gunnart Muent and Olivier Debande, from the EIB.

The findings, interpretations and conclusions presented in this research are entirely those of the author and should not be attributed in any manner to the European Investment Bank.

About the author:

Francesca Casalini is Research Fellow at SDA Bocconi School of Management. Her research activities focus, among others, on Public-private partnerships (PPP) and innovative investment models in regulated industries. She is PhD Candidate at the University of St. Gallen.

1. Introduction.....	4
2. Existing Investment Vehicles for Private Infrastructure Financing	6
3. Barriers to Infrastructure Investing.....	9
4. Public Policies to Attract Private Investors in Infrastructure.....	11
5. Lessons learned from international experience	15
6. Conclusion.....	19
References	20

1. Introduction

This conference paper has been written in response to the request by the European Investment Bank (EIB) to map out ways of satisfying investment demand over and beyond what public sectors will likely fund via various additional private sector sources. This paper draws from previous research carried out by Bocconi University and SDA Bocconi about government policies to mitigate the risk of infrastructure investments and attract institutional investors (Vecchi, Hellowell, Della Croce, & Gatti, 2016). (EPEC, 2011). The research attempts to add further evidences to the results exposed in the 2017 Report of the High-Level Task Force (HLTF) on investing in Social Infrastructure in Europe chaired by Romano Prodi and Christian Sautter.

While a substantial proportion of infrastructure has been historically owned by public authorities and financed through taxation and/or public debt, over the last 30 years, public budgets constraints and privatization policies have led to a reconsideration of the need to shift the investment effort to the private sector and to the development of Public Private Partnerships (PPPs). In recent years, besides industrial sponsors and developers, who were the main private investors in infrastructure projects before mid-2000s, infrastructures are garnering interest from a new range of long-term investors, like pension funds and life insurance companies (Gatti 2014), attracted by the long maturities and stable returns associated with infrastructure-related financial securities¹ (World Economic Forum 2013). In fact, after the global financial crisis, the institutional investment community has been engaged in a ‘search for yield’ – i.e. for higher returns than accrue to traditional asset classes – and infrastructure have been cited as a potentially desirable ‘alternative asset class’ (Gatti and Della Croce 2015).

However, despite the huge private liquidity available, with retirement systems and life insurers in OECD countries holding, respectively, USD 30.2 trillion and USD 14.7 trillion in assets in 2014 (OECD 2015a), and the theoretical ideal match between the risk and return profile of these investors and the characteristics of infrastructure as an

¹ From the point of view of a private investor, infrastructure projects show attractive characteristics, such as (Gatti 2012): 1) Long term assets with long economic life; 2) Low technological risk; 3) Provision of key public services; 4) Strongly non elastic demand; 5) Natural monopoly or quasi monopoly market contexts; 6) High entry barriers; 7) Regulated assets; 8) Frequent natural hedge against inflation; 9) Stable, predictable operating cash flows; 10) Low correlation with traditional asset classes and overall macroeconomic performance.

asset class, the uptake of these institutional investors has been slow. In addition to the lack of a transparent and stable regulatory framework, this has been due to, *inter alia*, negative experiences with early investments, discontent with the vehicles used to access infrastructure assets and a lack of government facilitation (Gatti and Della Croce 2015).

In this context, it seems useful, for the EIB and the HLTF, to identify and promote instruments that facilitate the attraction of institutional investors' liquidity to bridge the infrastructure gap.

2. Existing Investment Vehicles for Private Infrastructure Financing

There is a number of different vehicles on offer for private investment in infrastructure (OECD, 2015b). Both debt and equity instruments have been used, either publicly or privately traded. Instrument selection depends not only on the nature of the asset (debt or equity, listed or unlisted), but also on the investment model, which can be direct or indirect, as shown in Table 1 below.

Direct investing is defined as an investment in which the asset owner deploys capital directly, without intermediation, into a specific infrastructure project, usually incorporated in a Special Purpose Vehicle (SPV). Direct investments include solo investments as well as co-investments (Fang, Ivashina, & Lerner, 2015; World Economic Forum, 2014). Solo direct investing is when all the important steps of the investment decision and implementation are led by the in-house team, though they may outsource specific tasks to specialists such as lawyers, industry experts, technical advisers. An alternative route to solo direct investing is the co-investment model, in which the asset owner makes a minority investment directly into the infrastructure project, alongside a financial sponsor or other investors.

On the other way round, indirect investing is when the asset owner invests either in a fund managed by a third-party asset manager, which, in turn, invests in an infrastructure project, or in a company that is in business to build and operate infrastructure, which may issue shares or borrow funds through capital markets to finance its projects.

The choice of the investment vehicle and model mainly depends on how the investors have defined and allocated infrastructure in their portfolios, based on their asset and liability framework, on regulatory and tax considerations and on investors size and level of sophistication (i.e., institutional investors with small amounts of capital allocated to infrastructure do not generally have internal dedicated expert teams and are thus limited to capital pool channels and corporate investments, while larger investors may have the internal knowledge and resources to commit capital directly to projects).

Table 1 - Instruments for infrastructure financing

		Investment Model		
		Direct (to infrastructure projects)	Indirect (through infrastructure operators or asset managers)	
Asset Category and Trading Mode	Debt	Listed	<ul style="list-style-type: none"> ▪ Listed Project Bonds 	<ul style="list-style-type: none"> ▪ Listed Infrastructure Debt Funds ▪ Infrastructure Corporate Bonds
		Unlisted	<ul style="list-style-type: none"> ▪ Syndicated Project Loans ▪ Unlisted Project Bonds ▪ Direct/Co-Investment Lending to Infrastructure Project 	<ul style="list-style-type: none"> ▪ Unlisted Infrastructure Debt Funds
	Equity	Listed		<ul style="list-style-type: none"> ▪ Listed Infrastructure Equity Funds ▪ Listed Infrastructure Corporate Stocks ▪ ETFs
		Unlisted	<ul style="list-style-type: none"> ▪ Direct/Co-Investment in Infrastructure Project Equity 	<ul style="list-style-type: none"> ▪ Unlisted Infrastructure Equity Funds

Source: Author summary based on Della Croce and Sharma (2014) and OECD (2015b)

Among the different instruments available, institutional investors traditionally invested in infrastructure through listed companies and fixed-income instruments (Gatti & Della Croce, 2015). It is only in the last two decades that investors started to recognize infrastructure as a distinct asset class and to hold the view that, while listed infrastructure tends to move in line with broader market trends, investing in unlisted infrastructure – although illiquid – can be beneficial for ensuring proper diversification and yield upside (Inderst, 2009; World Economic Forum, 2014). Unlisted equity or debt is indeed typical “buy and hold” asset classes, suited to long-term investors with a clear preference for stable – although not exceptionally high – returns.

The most widespread financial technique that allows the participation of private capital to unlisted infrastructure is project financing, based on a simple combination of multiple tranche loans and equity (Yescombe, 2011).

Project finance debt has been provided to infrastructure projects mainly in the form of syndicated bank loans, with a pool of banks headed by one or more mandated lead arrangers (MLAs) organizing the financing package for a single borrower. From the perspective of institutional investors other than banks, a more attractive alternative to syndicated loans is represented by the financing of infrastructure projects through

project bonds. Project bonds, which are issued by the SPV, are more standardised capital market instruments, with a higher degree of liquidity, a lower cost of funding, if the issue size is sufficiently large to generate enough floating securities, and a longer maturity than the tenors of syndicated loans that banks normally accept (Gatti & Della Croce, 2015). Project bonds, however, are only a limited portion of the total debt committed to infrastructure financing, representing slightly less than 10% of the total infrastructure debt at the end of 2015 (Project Finance International, 2016).

On the equity side, before mid-2000s, almost all infrastructure projects received equity financing by industrial sponsors and developers, typically the off-taker, the EPC contractor, the suppliers and/or the companies responsible for the operation and maintenance of the infrastructure to be delivered. Starting from mid-2000s, thanks to the diversification strategies put in place by institutional investors, data indicate a clear upward trend in global infrastructure fundraising for private equity investments, with aggregate funds under management that have risen from USD 1.1 billion in 2004 to USD 363.3 billion at the end of 2015 (Preqin, 2016). While market analysis suggests that unlisted equity funds are the most common vehicle (Probitas Partners, 2015), the route via which institutional investors access unlisted infrastructure equity underwent significant changes over the last four years, with a greater number of investors seeking to invest or co-invest directly in infrastructure assets (Preqin, 2016).

3. Barriers to Infrastructure Investing

Despite evidences of a growing interest among institutional investors, infrastructure investments in the form of unlisted equity and debt are a small fraction of pension funds and other long-term investors portfolio (e.g., they represent only 1.1% of the total assets under management of pension funds in OECD countries at the end of 2015, according to OECD 2015a).

There is indeed a number of barriers to participation of institutional investors to unlisted infrastructure financing. In addition to institutional and political factors such as the lack of a transparent and stable regulatory framework and a shortage of national and supranational long-term plans for infrastructure development (Allen & Overy, 2009; Verhoest, Petersen, Scherrer, & Murwantara Soecipto, 2014), this has been due to, *inter alia*, negative experiences with early investments, discontent with the vehicles used to access infrastructure assets and a lack of government facilitation (Gatti & Della Croce, 2015).

Infrastructure investing has some characteristics *vis-a-vis* other asset classes that hinder the entry of institutional investors. High up-front costs, lack of liquidity and long asset life of the projects, indeed, make it difficult to assess the infrastructure investments profile and calculate their risk/return ratio (Blanc-Brude, Hasan, & Whittaker, 2016a, 2016b; R. Brealey, Myers, & Allen, 2013; Inderst, 2009). The risk assessment is also challenging because it is not only contingent on the industry sector and the underlying project and stage of development, but it also lacks clear and agreed international benchmarks due to a paucity of high-quality historical data. For this reason, institutional investors generally have a preference for brownfield investments rather than greenfield projects, which they perceive as more risky since they have not been built and do not generate constant current income yet (Della Croce, 2011; Gatti, 2014).

A further major barrier is the lack of internal knowledge and expertise to deal with infrastructure investments. Evaluating infrastructure investment opportunities and executing an effective long-term investment strategy requires significant scale, dedicated resources and experience, which many pension funds and other institutional investors do not have due to their small size and/or the novelty of this investment approach (Della Croce & Sharma, 2014).

The information asymmetries and the high costs of assessing and undertaking investments associated to unlisted infrastructure, as well as the lack of internal specialist knowledge, traditionally led investors to delegate this process to external investment managers (Admati & Pfleiderer, 1994; Allen & Santomero, 2001; Richard Brealey, Leland, & Pyle, 1977; Chan, 1983; Diamond, 1984; Fenn, Liang, & Prowse, 1996). However, this delegated form of investing has come under scrutiny in recent years as it showed some limits in terms of misaligned interests, high fees, poor returns and short-termism embedded in certain third-party management agreements, limits that have been further heightened by the global financial crisis (Bachher & Monk, 2013; Fang et al., 2015). A key concern associated to indirect delegated investing is the classic principal-agent problem (Eisenhardt, 1989): the intermediary may engage in behaviours that benefit portfolio managers rather than the investors, growing fees at the expense of returns (Harris, Jenkinson, & Kaplan, 2014; Kaplan & Schoar, 2005; Robinson & Sensoy, 2013), investing at market peaks when expected returns are modest (Axelson, Jenkinson, Strömberg, & Weisbach, 2013), and exit transactions prematurely to facilitate fundraising (Gompers, 1996). Moreover, the shorter-term focus of unlisted infrastructure funds, which typically have a private equity structure and a 10-year maturity, is not fully consistent with the long-term hold philosophy of core infrastructure, but seems more suited to turn-around deals (Monk & Sharma, 2015b). There is also a maturity mismatch between the length of these funds with the liabilities of pension funds and other long-term investors, which are usually much longer than 10 years (Inderst, 2009).

To overcome both the limits of the delegated fund model and the lack of in-house investment skills required for solo direct investing, the co-investment provides providing an alternative for institutional investors to access investment opportunities on more favourable terms. Co-investments have been prevalent in the private equity asset class and are an increasing feature of infrastructure fund offerings (Probitas Partners, 2015). Co-investments, however, have some pitfalls as well. An adverse selection problem indeed may arise as fund managers lack the incentive to bring the best deals to investors for co-investments (Fang et al., 2015; Monk & Sharma, 2015a). Fund managers may also have a lower motivation to monitor co-investment deals and maximise the value created, spending more time and efforts on the portfolio investments that are likely to provide them with higher fees (Monk & Sharma, 2015a).

4. Public Policies to Attract Private Investors in Infrastructure

To attract private finance into the infrastructure sector, especially in the aftermath of the global financial crisis, many governments have introduced policies and financial instruments to mitigate the financial risks associated with infrastructure development, and thereby enhance the availability and/or reduce the cost, of private capital (Hellowell, Vecchi, & Caselli, 2015). Especially after the introduction of the new international regulatory framework for banks (Basel III), these policy instruments remain an indispensable element to attract alternative risk-averse long-term investors in the infrastructure sector.

These measures can be grouped into main five categories: (1) grants, (2) availability-based payments, (3) credit enhancement tools, (4) direct provision of debt and equity capital, and (5) other measures. Each measure can be then articulated into specific instruments.

1. Grants

Grants reduce the capital requirements of the project or integrates revenues; it is generally delivered by contracting authority, even if some dedicated fund at national level may exist. A grant can be of three types:

1.1 *Lump sum capital grant*, to reduce the need of private capital; it may be delivered at the contract signature or during the implementation of the works, usually on a milestone-basis; in the latter case, a performance bond may be required to guarantee the correct allocation of the grant;

1.2 *Revenue grant*, to increase the revenue volume and stability when the risk of demand is retained by the private player and tariffs are set at social value; it is generally defined at the contract signature and it can be paid by the authority as a periodic fixed amount (with a stronger effect on the mitigation of demand risk) or as revenue integration (it leaves the demand risk on the concessionaire);

1.3 *Grant on debt interests*, to reduce the amount of interests due to the debt provider, thus mitigating the effect of high interest rates or the volatility of the demand on the debt repayment plan.

2. Availability-based payments

Availability payments neutralize the demand risk, while leaving on the private concessionaire the performance risk and the optimization of the cost/income ratio

(Fitch Rating, 2015). Though the availability payment is the typical payment mechanism for social infrastructure, where the main user is the public authority (such as in the case of hospitals), increasingly it has been used also for economic infrastructure. In this latter case the service can be delivered free of charge to users or the tariff are retained by the public authority. The availability payment done by the authority to the concessionaire can be reduced by applying penalties that can be linked not only to the “pure” availability, but also to other quality and safety standards (the so called “constructive availability”). Thanks to the positive effects on the stability of the cash flow of the project, the availability payment allows the concessionaire to access lower interest rate debt and more comfortable covenants (such as lower DSCR).

3. Credit-enhancement tools

Credit-enhancement tools are realized directly by a government or by its own controlled agency or development bank and can assume three forms:

3.1 *Minimum payment* to reduce the demand risk, which is partially retained by the contracting authority, which is committed to guarantee a certain level of revenues, generally those necessary to cover the debt service at some level of the DSCR (debt service cover ratio); Gatti, Borgonovo, & Modonesi (2013) demonstrated that the presence of revenue guarantees reduces the variability of Cover Ratios and IRRs, since it allows a more accurate and stable estimation of future operating cash flows generated by the project;

3.2 *Guarantee in case of default*: to insure lenders from the risk of concessionaire’s default via a public guarantee on debt principal and interest payment;

3.3 *Guarantee in case of refinancing*: to repay lenders if the concessionaire fails to refinance the loan at maturity; actually, in the context of “mini perm” (i.e. a debt structure that can - soft mini perm - or must - hard mini perm - be refinanced after the construction phase) there is a risk that existing debt will not be repaid from new borrowing (risk of refinancing), especially in case of increased interest rates or changed market conditions.

4. Direct provision of debt and equity capital

Provision realised directly by a government or by a controlled agency or development bank, can take three main forms:

4.1 *Subordinated (junior) debt* aimed at enhancing the credit quality of the senior debt through in order to attract investment from insurance companies and pension funds;

4.2 *Debt, provided at market condition*, to cope just with the liquidity shortage, or at lower interest rate to help the project to meet the expectation of debt capital investors, in term of interest rate, DSCR and maturity. In this latter case it should be considered the crowding out effect that this mechanism can generate;

4.3 *Equity*, provided at market conditions or at more advantageous conditions: the aim is generally to fill the equity gap; to reduce the financial gearing, therefore reducing the exposure to credit risk and to offer downside protection or upside leverage to private equity holders.

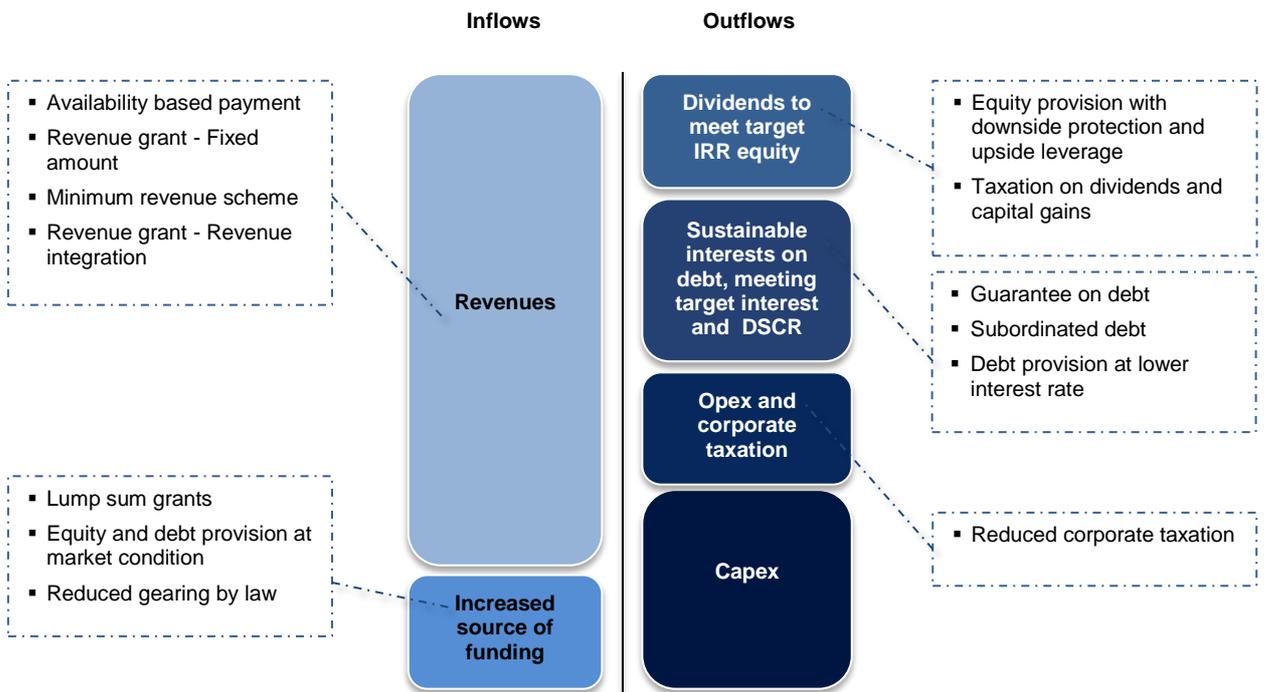
5. Other measures

5.1 *Officially mandated change to capital structure* (reduced gearing), as introduced in the UK under PF12, aimed at strengthening the ability to absorb fluctuations in cash-flows and thereby further insulate the lenders' exposure to credit risk;

5.2 *Favourable taxation schemes*, for the SPV to sustain the general viability of the project (the effect is to increase free cash flow to operation) or for the equity investors on "certain qualified dividends" and long-term capital gains.

Figure 1 summarizes these forms of public support, by showing their effects on the main components of the project cash flow. The tools on the left side of the picture are generally introduced to increase and/or stabilize the money inflows of project (i.e. current revenues and long-term funding), while the tools on the right side reduce and/or stabilize the money outflows (i.e. capital costs, operating costs and corporate taxation, interest on debt and dividends).

Figure 1 – The effect of policy instrument on project cash flows and ratios



Source: Vecchi et al. (2017)

5. Lessons learned from international experience

In the context of the pressing need to stimulate the supply of private capital to infrastructure projects, including PPPs, many international organizations, governments, investors and operators have recognized the importance of understanding the nature of, and outcomes from, a number of risk mitigation strategies that are currently being deployed by governments (Hellowell, Vecchi, & Gatti, 2015).

Historically, risk mitigation policies have been focused on emerging economies, thanks to the support of MDBs. More recently, however, these policies have become a prominent feature of infrastructure investment projects in the advanced economies of Europe, North America and Australia and also emerging markets' Governments are put in place dedicated strategies and initiatives. Therefore this section is devoted to analyse the main tools put in place with reference to the main categories presented earlier in Section 4.

Table 2 summarizes the main applications of these tools across the world.

Table 2 - A summary of international experiences and lessons learned

Case Number	Country / Region	Instrument Type	Lesson Learned
Grants			
Case Study 1	EU	Lump sum capital	Within the 2014-2020 cohesion policy cycle, it is recommended to allocate EU structural funds also through PPP. Blended PPP projects have been successful mostly when the private partner was selected prior to the application for the grant and the national public authority was already providing finance for an important portion of the project in addition to any EU grant contribution
Case Study 2	Korea	Lump sum capital	"Act on private participation in infrastructure, art. 53" explicitly foresees the awarding of public grants; the situations when the grant may be issued are prescribed by law in art. 37 of the "Enforcement decree"; the amount of subsidy should not exceed the 30% of construction costs for road projects, the 40% for port infrastructures and the 50% for railway projects
Case Study 3	India	Lump sum capital	In 2005, the Government of India launched the Viability Gap Funding scheme, to provide up-front capital grants at the construction stage. Grants may not exceed 20% of the project cost

			and are disbursed only after the private company has made its required equity contribution; the amount of subsidy is determined through a competitive bidding process
Availability- based Payments			
Case Study 4	US	Availability payment	After that five out twelve toll based concessions projects already operational by 2014 failed, the availability payment system has been introduced by the US Department of Transportation and eight new schemes without traffic risks awarded
Case Study 5	Canada	Availability payment	In Canada, almost all the concessions are availability- based since the adoption of PPP and none that reached the operational stage have faced a significant threat of financial failure or termination due to poor contractor performance
Credit Enhancement			
Case Study 6	Korea	Minimum Payment	From 1995 to 2006, The Minimum Revenue Guarantee guaranteed 70-90% the projected revenues for a period of 15-20 years and it turned out to be a financial burden for the Korean Government. In 2006 the system was revised in 2006 and the Government guaranteed 65%–75% of the projected revenue for 10 years only for solicited projects.
Case Study 7	Brazil	Minimum Payment	This transaction is a good example of demand risk mitigation, where the mechanism used is based on minimum and maximum levels of demand; If passenger traffic fluctuation is within a pre-determine range, the private concessionaire absorbs the upside or downside, while outside this range, the public authority shares the gains or losses
Case Study 8	Mexico	Minimum Payment	BANOBRAS, the Development Bank of Mexico, provides a guarantee to cover full and timely payment committed to the private sponsor under a PPP project with the aim to help subnational entities (states and municipalities) attract private investors, and this mechanism is particularly valuable for entities with a lower credit rating
Case Study 9	UK	Guarantee in case of default	The UK Guarantee Scheme was introduced by the HM Treasury in 2012 to avoid delays to investment in UK infrastructure projects that may have stalled because of adverse credit

			conditions making it difficult to secure private finance. It provides, on a commercial basis, a sovereign-backed guarantee, which must cover a financial obligation. However, the contribution of the scheme to the National Infrastructure Plan has been modest to date and it is due to close at the end of December 2016.
Case Study 10	Mexico	Guarantee in case of default	Always in Mexico, loan guarantees in case of default are offered by the BANOBRAS, the Development Bank, and FONADIN, the Infrastructure Fund of the Mexican Federal Government. However, these schemes have not been as widely used as expected, since they do not assume the construction risk.
Case Study 11	India	Guarantee in case of default	The Credit Enhancement Scheme, managed by the Indian Infrastructure Finance Company Limited (IIFCL), is available for brownfield projects and provides partial credit guarantee to enhance the credit rating of bonds of infrastructure companies. The scheme is currently under pilot phase.
Case Study 12	Belgium	Guarantee in case of default	To mitigate the impact of the financial crisis, the Flemish government introduced in April 2009 a refinancing guarantee scheme for projects which had already been tendered or became ready for tender by April 2011. Such a guarantee has been granted to the “Flemish PPP schools” project, where the Government has borne the majority of the financing risk.
<i>Direct provision of debt or equity</i>			
Case Study 13	EU	Subordinated debt	The Project Bond Initiative, launched in 2012 by the European Commission and the European Investment Bank to facilitate institutional investors financing of infrastructure projects, has been applied to projects in the sectors of transport, energy, and ICT. In all the cases, the provision of the subordinated debt by the European Investment Bank enhanced the rating of the bonds, on average, by 3 notches.
Case Study 14	US	Subordinated debt / Debt	The TIFIA program provides direct loans (either junior or senior) to qualified infrastructure projects of regional and national significance, with at least USD 50 million of eligible costs. Loans provided by TIFIA typically have a lower interest with flexible repayment terms.
Case Study 15	UK	Debt	The first experiment was introduced in 2004, under the Credit Guarantee Finance (CGF)

			<p>initiative. In March 2009, the UK Treasury announced the establishment of a short-term new private limited company: the Treasury Infrastructure Finance Unit (TIFU), which would have provide state loans to projects at prevailing market rates. Both measures were used in few cases.</p>
Case Study 16	Belgium	Equity	<p>In the Flemish region, the public limited company Via-Invest was established in 2006 with the aim to fill in the missing links in the Flemish road network via PPPs. Via-Invest is a structural joint venture between the Agency for Roads and Traffic, the Department of Transport and Public Works and the investment company PMV. Via-Invest acts as a holding company for various SPV and provides them with risk capital.</p>

6. Conclusion

Due to public budget constraints and privatization policies, private capital will play an important role in the delivery of new infrastructure. Moreover, infrastructures are attracting interest from a new range of investors, like pension funds or sovereign wealth funds, thanks to their stable return (Gatti, 2014; World Economic Forum, 2013).

This conference paper provides a framework for the identification and appraisal of instruments used by governments around the world to sustain the supply of private finance for infrastructure development. As the use of such instruments may have significant fiscal and economic implications, understanding the options available among those mainly used across the world, the mechanisms through which they reduce investor risk, and the possible unintended effects, is a priority for the governments and international institutions that select and appraise them.

References

- Admati, A. R., & Pfleiderer, P. (1994). Robust financial contracting and the role of venture capitalists. *The Journal of Finance*, 49(2), 371–402.
- Allen & Overy. (2009). *Global infrastructure development and delivery. The stimulus for debate*. Retrieved from <http://www.allenoverly.com/archive/Documents/Legacy/52624.pdf>
- Allen, F., & Santomero, A. M. (2001). What do financial intermediaries do? *Journal of Banking & Finance*, 25(2), 271–294.
- Axelson, U., Jenkinson, T., Strömberg, P., & Weisbach, M. S. (2013). Borrow cheap, buy high? The determinants of leverage and pricing in buyouts. *The Journal of Finance*, 68(6), 2223–2267.
- Bachher, J. S., & Monk, A. H. B. (2013). Platforms and Vehicles for Institutional Co-Investing. *Rotman International Journal of Pension Management*, 6(1).
- Blanc-Brude, F., Hasan, M., & Whittaker, T. (2016a). Benchmarking Infrastructure Project Finance: Objectives, Roadmap, and Recent Progress. *The Journal of Alternative Investments*, 19(2), 7–18.
- Blanc-Brude, F., Hasan, M., & Whittaker, T. (2016b). *Cash Flow Dynamics of Private Infrastructure Project Debt, Empirical evidence and dynamic modelling*. EDHEC Infrastructure Institute Publications March.
- Brealey, R., Leland, H. E., & Pyle, D. H. (1977). Informational asymmetries, financial structure, and financial intermediation. *The Journal of Finance*, 32(2), 371–387.
- Brealey, R., Myers, S., & Allen, F. (2013). *Principles of Corporate Finance*. New York: McGraw-Hill. Retrieved from <http://www.waterstones.com/waterstonesweb/products/richard+a+brealey/stewart+c+myers/alan+j+marcus/fundamentals+of+corporate+finance/6358665/>
- Chan, Y. (1983). On the positive role of financial intermediation in allocation of venture capital in a market with imperfect information. *The Journal of Finance*, 38(5), 1543–1568.
- Della Croce, R. (2011). *Pension Funds Investment in Infrastructure: Policy Actions* (OECD Working Papers on Finance, Insurance and Private Pensions No. 13).
- Della Croce, R., & Sharma, R. (2014). *Pooling of Institutional Investors Capital, Selected Case Studies in Unlisted Equity Infrastructure*.
- Diamond, D. W. (1984). Financial intermediation and delegated monitoring. *The Review of Economic Studies*, 51(3), 393–414.

- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14(1), 57–74.
- Engel, E., Fischer, R., & Galetovic, A. (2009). *Soft budgets and renegotiations in public-private partnerships*. National Bureau of Economic Research.
- EPEC. (2009). *The financial crisis and the PPP market. Potential Remedial Action*.
- EPEC. (2011). *State Guarantees in PPPs*. Retrieved from <http://www.eib.org/epec/resources/epec-state-guarantees-in-ppps-public.pdf>
- Fang, L., Ivashina, V., & Lerner, J. (2015). The disintermediation of financial markets: Direct investing in private equity. *Journal of Financial Economics*, 116(1), 160–178.
- Fenn, G. W., Liang, N., & Prowse, S. (1996). The Economics of the Private Equity Market. *Fed. Res. Bull.*, 82, 26.
- Fitch Rating. (2015). *Rating Criteria for Availability-Based Projects Global Infrastructure & Project Finance*.
- Forrer, J., Kee, J. E., Newcomer, K. E., & Boyer, E. (2010). Public–private partnerships and the public accountability question. *Public Administration Review*, 70(3), 475–484.
- Gatti, S. (2014). *Government and Market Based Instruments and Incentives to Stimulate Long-term Investment Finance in Infrastructure* (OECD Working Paper).
- Gatti, S., Borgonovo, E., & Modonesi, D. (2013). *Governmental guarantees in the Valuation of highway projects: a simulation-based real options approach*.
- Gatti, S., & Della Croce, R. (2015). International trends in infrastructure finance. In S. Caselli, G. Corbetta, & V. Vecchi (Eds.), *Public Private Partnership for infrastructure and business development*. New York: Palgrave Macmillan.
- Gompers, P. A. (1996). Grandstanding in the venture capital industry. *Journal of Financial Economics*, 42(1), 133–156.
- Harris, R. S., Jenkinson, T., & Kaplan, S. N. (2014). Private equity performance: What do we know? *The Journal of Finance*, 69(5), 1851–1882.
- Hellowell, M., Vecchi, V., & Caselli, S. (2015). Return of the state? An appraisal of policies to enhance access to credit for infrastructure-based PPPs. *Public Money & Management*, 35(1), 71–78.
- Hellowell, M., Vecchi, V., & Gatti, S. (2015). *Government Policies to Mitigate the Risks of Infrastructure Projects: A Framework for Classification And Analysis*.

- Inderst, G. (2009). *Pension Fund Investment in Infrastructure*. OECD Working Papers on Finance, Insurance and private pensions.
- Iossa, E., & Martimort, D. (2015). The Simple Microeconomics of Public - Private Partnerships. *Journal of Public Economic Theory*, 17(1), 4–48.
- Kaplan, S. N., & Schoar, A. (2005). Private equity performance: Returns, persistence, and capital flows. *The Journal of Finance*, 60(4), 1791–1823.
- Matsukawa, T., & Habeck, O. (2007). *Review of risk mitigation instruments for infrastructure financing and recent trends and developments* (Vol. 4). World Bank Publications.
- Monk, A. H., & Sharma, R. (2015a). *Capitalising on Institutional Co-Investment Platforms* (Stanford Global Projects Center Working Paper).
- Monk, A. H., & Sharma, R. (2015b). *Re-Intermediating Investment Management: A Relational Contracting Approach* (Stanford Global Projects Center Working Paper).
- OECD. (2015a). *Annual Survey of Large Pension Funds and Public Pension Reserve Funds*.
- OECD. (2015b). *Infrastructure Financing Instruments and Incentives* (OECD series on institutional investors and long-term investment).
- OECD. (2015c). *Mapping of instruments and incentives for infrastructure financing: a taxonomy*.
- Preqin. (2016). *Global Infrastructure Report*.
- Probitas Partners. (2015). *Infrastructure Institutional Investors. Trends for 2016 Survey*. Retrieved from http://probitaspartners.com/wp-content/uploads/2015/09/probitas_partners_Infra_investor_surveyfor_2015.pdf
- Project Finance International. (2016). *Yearbook 2016*.
- Robinson, D. T., & Sensoy, B. A. (2013). Do private equity fund managers earn their fees? Compensation, ownership, and cash flow performance. *Review of Financial Studies*, 26(11), 2760–2797.
- Saussier, S. (2013). *An economic analysis of the closure of markets and other dysfunctions in the awarding of concession contracts* (EUI RSCAS No. 2013/08). Retrieved from <http://hdl.handle.net/1814/26058>
- Vecchi, V., Borgonovo, E., Amadio, S., Cusumano, N., & Gatti, S. (2016). *Do public guarantees to infrastructure investments engender moral hazard of private bidders? A multiple agents based simulation* (Paper Laboratorio ASPI – Bocconi).
- Vecchi, V., Hellowell, M., della Croce, R., & Gatti, S. (2017). Government policies to enhance

access to credit for infrastructure-based PPPs: an approach to classification and appraisal. *Public Money & Management*, 37(2), 133–140.

Vecchi, V., Hellowell, M., Della Croce, R., & Gatti, S. (2016). Government policies to enhance access to credit for infrastructure-based PPPs: an approach to classification and appraisal. *Public Money & Management*, (in press).

Verhoest, K., Petersen, O. H., Scherrer, W., & Murwantara Soecipto, R. (2014). *Policy commitment, legal and regulatory framework, and institutional support for PPP in international comparison: Indexing countries' readiness for taking up PPP*. PPP Conference 2013, Universiteit Antwerpen: University of Salzburg.

World Economic Forum. (2013). *Strategic Infrastructure. Steps to Prepare and Accelerate Public-Private Partnerships*. Retrieved from http://www3.weforum.org/docs/AF13/WEF_AF13_Strategic_Infrastructure_Initiative.pdf

World Economic Forum. (2014). *Direct Investing by Institutional Investors: Implications for Investors and Policy-Makers*.

Yescombe, E. R. (2011). *Public-private partnerships: principles of policy and finance*. Butterworth-Heinemann.