

Quantifying Private and Foreign Investment in Transport Infrastructure



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Working Group Paper 2019

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Foreword

Transport infrastructure is a major enabler of economic development. In the drive to refurbish or build, governments worldwide have turned to the private capital market for financing. The primary narrative behind this push is the huge stocks of private capital that are available, while public financing capabilities are said to be limited and insufficient.

The almost exclusive vehicle of private investment in transport infrastructure, including social infrastructure, is Public-Private Partnerships (PPPs). In the context of PPPs, two important aspects have received little attention.

First, sufficient attention has not been given to the role of suppliers. The focus of governments and Intergovernmental Organisations has been on resolving the challenges to private investment from the viewpoint of investors: reducing the uncertainty they face and enabling them to price risk more efficiently by establishing infrastructure as an asset class.

However, looking only at investors gives an incomplete view of the total cost of the risk transferred from the public to the private sphere. In PPPs, investors transfer some of the major risks they are not comfortable bearing to design, construction, maintenance, and operations contractors.

Suppliers, too, face uncertainties and are unable to efficiently evaluate price risk. In such cases, the base cost of the initial investment - and of subsequent services - may be much higher than they might have been, and not just the cost of their financing.

Uncertainty arises from the difficulties to accurately estimate the cost of construction, maintenance, operations, and financing. But it also stems from "unknown unknowns" (the so-called Knightian uncertainty). For instance, changes in weather patterns or paradigmatic technological shifts, the timing and impact of which are unclear, will influence what infrastructure is needed and where.

So what can policy makers do to reduce the cost of inefficient risk pricing of suppliers? Where does this put PPPs? How can public decision makers reconcile long-term uncertainty with private investment in infrastructure? Who should bear long-term uncertainty in projects: the public or the private sector?

These were some of the guiding questions for a Working Group of 33 international experts convened by the International Transport Forum (ITF) In September 2016. The group, which assembled renowned practitioners and academics from areas including private infrastructure finance, incentive regulation, civil engineering, project management and transport policy, examined how to address the problem of uncertainty in contracts with a view to mobilise more private investment in transport infrastructure. As uncertainty matters for all contracts, not only those in the context of private investment in transport infrastructure, the Working Group's findings are relevant for public procurement in general.

The synthesis report of the Working Group was published in June 2018. The report is complemented by a series of 19 topical papers that provide a more in-depth analysis of the issues. A full list of the Working Group's research questions and outputs is available in Appendix 3.

Acknowledgements

This report was initially produced for the OECD Investment Committee under its work programme on infrastructure investments. It was presented and discussed at the OECD Investment Committee meeting in December 2015. The report was also discussed at the OECD Meeting of Senior Public-Private Partnerships and Infrastructure Officials, organised by the Directorate for Public Governance and Territorial Development in February 2016, and at two meetings of the OECD/G20 Task Force on Institutional Investors and Long-Term Financing in March and April 2016. It benefited from colleagues' comments of the International Transport Forum and various OECD bodies, namely the Economics Department, Development Centre, Directorate for Public Governance and Territorial Development, and the Investment and Financial Affairs Divisions of the Directorate for Enterprise and Financial Affairs. The report was possible in large part thanks to the contribution of Michael Gestrin from the OECD Investment Division, who kindly compiled and shared the data on transport infrastructure projects.

The current version of the report embodies revisions and feedback received, and integrates updated information regarding transport infrastructure projects in the period 2015-2016. It does not, however, address recent developments extensively. Data supporting the section on privatisation have not been updated due to accessibility limitations.

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Executive summary

What we did

Transport infrastructure is an essential ingredient to economic development and inclusive growth. It is the critical backbone for the emergence and expansion of global value chains. Both OECD and non-OECD countries face significant pressure to keep up with infrastructure investments, either to upgrade or replace existing ageing infrastructures or to continue expanding infrastructure. In this context, and despite the challenges to ensure they deliver upon value for money expectations, governments have increasingly turned to the private sector for infrastructure delivery. Yet, the surprisingly limited availability of data on private investments in transport infrastructure at more disaggregated levels constitutes an important limitation to effective policy making.

This report represents a first attempt to quantify private and foreign investment in transport infrastructure by sub-sectors – airports, ports, railroads and roads – in a large range of countries, covering investments in 108 economies from 1995 to 2016. To date, evidence-based analysis and informed policy-making has been hindered by important data limitations of public statistics systems. Knowing how much investment in transport infrastructure exists and how it has evolved overtime is critical for policy-makers. It allows them to assess existing policies and to influence the levels and types of transport infrastructure investments. This report represents a starting point, and by no means provides an exhaustive picture. It draws on existing commercial databases to broaden the evidence of private participation in transport infrastructure at more disaggregated levels. It is original in that it also provides one of the first estimates of foreign participation in transport infrastructure.

What we found

Private investment in transport infrastructure reached almost USD 1.35 trillion within 1995-2016 (in constant 2014 Purchasing Power Parity terms). Around half was spent in OECD countries. Globally, 62% of investments take place in just ten countries. Seven of them – the United Kingdom, Australia, United States, Spain, Turkey, Korea and France – are OECD member countries and are responsible for 32% of the total and 64% of the investments in OECD countries. India, China and Brazil account for the remaining 30% of the total and 61% of investments in non-OECD countries. The road sector accounted for half of the investments in the period, followed by railroads (26%), airports (14%) and ports (11%).

The number of countries recurring to private investments increased tremendously overtime. In the last five years, 32 countries turned to private investors for investments in infrastructure, compared to only 23 in the early 2000s. While a large number of countries – 39 out of 108 – turned to private investors for only three years or less, about 30 countries engaged with them for more than seven years.

Despite a crisis-related decline, private investments in transport infrastructure remain at higher levels than observed in the period just before its pre-crisis peak in 2006. From 2006-2010, investments more than doubled compared to the 2000-2005 period, despite the crisis that hit global markets during those

years. The crisis affected mostly investments in OECD countries, which halved from its pre-crisis peak in 2006. Nonetheless, investment levels remain higher than observed in the early 2000s. A recovery trend has been observed since 2012, though investments have yet to reach their pre-crisis peak. In non-OECD countries, the crisis only shortly strained investments' rapidly ascending trajectory. Investments began to decline in 2012 with the economic slowdown in the large emerging economies, but this has been reversed in the last couple of years, with investments reaching a new high in 2016. Privatisations, which played a major role in the early periods of private participation, are up again in both groups of countries as fiscally-constrained economies seek to sell up assets.

Attracting private investment to road infrastructure seems to have been particularly challenging for non-OECD countries. On average, the cumulative amount of private investments in transport infrastructure amounted to 2.3% in OECD countries and 1.8% in non-OECD countries between 1995 and 2016 as a share of the 2014 GDP. But important differences in the sectoral distribution of such investments are observed. Investments in roads and railroads have been more prevalent in OECD countries on average. Investments in the road sector were three times more important as a share of GDP than in non-OECD countries. This is partly explained by the poorer performance of smaller emerging and developing countries in attracting capital into these sectors.

From 1995 to 2016, foreign investors were involved in projects totalling roughly 58% of private investments in transport infrastructure in OECD countries and roughly 33% in non-OECD countries. Domestic investors have played an increasing role in non-OECD countries since the mid-2000s. From 2006 to 2010, projects with only domestic sponsors invested ten times more than between 2000 and 2005, increasing 2.9 times faster than the amount invested by projects involving foreign sponsors. This trend has accentuated from 2011 to 2016. This suggests a more competitive environment for foreign investors in the rapidly expanding emerging markets where domestic players' capacity is also growing.

The financing landscape for infrastructure projects has mostly recovered from the crisis. The liquidity dry-up observed during and in the aftermath of the global financial crisis has been mostly reversed in the traditional bank market and in capital markets. Bond financing, which had practically disappeared after the crisis with the demise of the monoline insurance market, has grown in both OECD and non-OECD countries in recent years, albeit representing still only a minor fraction of transport infrastructure financing – about 10% of the financing of projects within 2011-2014, against 4% in 2006-2010. It plays an increasing role in the refinancing of projects, which have reached their highest levels in recent years. The availability of other non-bank sources of capital has also grown.

What we recommend

Improve the collection and dissemination of disaggregated data on the level and characteristics of private investments in transport infrastructure

This paper showed that evidence-based policy making is partly inhibited by the lack of adequate and accessible data on both public and private investments in transport infrastructure at more disaggregated levels. Commercially available datasets may provide an alternative in the short-term, but important caveats remain to justify further efforts to improve the collection and dissemination of comprehensive data on the level and characteristics of private investments in transport infrastructure. This is a necessary endeavour for supporting more effective policy making, ultimately enabling the assessment of different policies and incentive frameworks for private participation in infrastructure and for contributing to making infrastructure an asset class.

Introduction

Transport infrastructure is an essential ingredient for economic development and inclusive growth. It raises economic opportunities and well-being by connecting firms and people to markets and by extending people's access to critical services. It facilitates agglomeration and helps to reduce the cost of transportation services, enabling further competition and productivity gains and broader welfare benefits. It is likewise crucial for the participation in global value chains and the degree of economic diversification. Conversely, inadequate transport networks may exacerbate their potential negative externalities, such as congestion and pollution. It may also entail some relocation of economic activity, which implies adjustment costs for affected regions.

Investment decisions regarding transport infrastructure have, therefore, critical long-term implications for development.¹ The OECD has estimated that over 4% of global GDP is required in infrastructure investments to sustain growth and social development up to 2030 (OECD, 2007; OECD, 2012). In OECD countries, investments are increasingly needed to upgrade or replace existing ageing infrastructures. Economic development and growing urbanisation are similarly driving demand for infrastructure expansion in developing economies. But current levels of investment fall far short of needs, leaving a global gap of about 1.25% of world GDP (WEF, 2013).²

Private investment³ can be an important ally to meet transport infrastructure needs in appropriate settings. The merits of private participation, however, may not lie on relieving strained government budgets as often advocated with public-private partnerships (PPP), but on the potential efficiency gains that may arise from their involvement (Engel, Fischer and Galetovic , 2009). PPPs are said to provide incentives to firms to minimise overall costs throughout the project's lifetime by bundling the responsibility for the initial capital investment with future maintenance and operating costs. They may also help to insulate projects from stop-go funding characteristic of traditional delivery and protect maintenance expenditures by conditioning payments on service quality and availability (Perkins, 2013).

However, the potential for private sector efficiency gains can easily be dissipated if competition and the regulatory framework for private participation are deficient. Inadequate project planning and risk sharing allocations in many transport PPP projects can result, and sometimes have, in renegotiations that prove expensive for taxpayers (Perkins, 2013; Bitran, Nieto-Parra and Robledo, 2013; OECD/CAF/ UN ECLAC, 2013).⁴ The role and some of the challenges of private investment through PPPs are covered in greater detail in Makovšek (forthcoming).

Nonetheless, mobilising greater levels of private investment into transport infrastructure has become a key priority for governments around the world. The surprisingly limited availability of consistent data on both public and private investment in transport infrastructure, however, constitutes an important limitation to effective policy-making in this regard (Wagenvoort, De Nicola and Kappeler, 2010). Knowing how much public and private investment in transport infrastructure exist and how have they evolved overtime is critical for policy-makers to assess existing policies and to influence the levels and types of transport infrastructure investments. Available national statistics often lack the required level of sector disaggregation for more detailed analysis and policy insights. Project-level statistics is a likely alternative but, at present, such data are more readily available for developing countries than for OECD countries, and almost no data on the non-financial performance of such projects are available. As such, the empirical literature has often explored the effects of policies and other determinants on investment in aggregated infrastructure sectors if not all combined, with a few exceptions (Hammani, Ruhashyankiko

and Yehoue, 2006; Moszoro et al., 2014; Basilio, 2011; Sharma, 2012) and often without distinguishing among types of investors and contractual modalities for private participation.

This report, therefore, aims to quantify private and foreign investment in transport infrastructure by subsectors in a large range of countries, including developed ones. Data cover investments in 108 economies from 1995 to 2016 and refer to investments in airports, ports, railroads and urban rail infrastructure, and roads, including bridges and tunnels. It represents a first attempt to profile such trends and by no means provides an exhaustive picture. A number of data-related caveats exist. Still, it yields interesting observations on how domestic and foreign investments have been channelled into transport infrastructure in OECD and non-OECD countries. Its main contribution comes from drawing on project-level data to broaden the evidence and understanding of private participation in transport infrastructure at more disaggregated levels. It also provides a first attempt to profile foreign participation in transport infrastructure. To our knowledge, there has been no such attempt in previous studies.

However, results should be interpreted with caution. The report does not overcome a number of datarelated gaps and challenges. It builds on a commercially available project-level database, which is not subject to any official vetting and may be subject to coverage shortcomings and inconsistencies. Data reported also do not represent the full spectrum of private investment possibilities. It covers mostly project finance deals, although a reasonable amount of large non-project finance deals are included.⁵ The varying importance of project finance across transport infrastructure sub-sectors is potentially a caveat – as corporate finance may play a large role in some cases. Data include PPPs, which may involve public support and investment, although upfront capital expenditures in PPPs are typically privately financed by equity and financial sponsors.

The limited information available, however, made it impossible to consistently distinguish cases where significant public involvement through state-owned companies or publicly-owned banking finance may have occurred. In this respect, one should interpret such data as an upper boundary for the level of private participation. Full or partial privatisations by state-owned companies are also included. Lease and management contracts are not covered, but these are unlikely to represent a significant form of private capital investment in most transport infrastructures.⁶ Finally, for ease of reading, this report applies the term "investment" to describe the project-based data used, but the data do not reflect annual investment flows in the normal way one would think about gross fixed capital formation. It refers instead to projects' total capital value at financial closure.

Further work to collect data on the level and characteristics of private and public investments in transport infrastructure at a disaggregated level is, therefore, required and would make it possible to investigate pertinent questions for supporting policy-making, ultimately enabling the assessment of different policies and incentive frameworks for private participation. The OECD is uniquely placed to launch a systematic data collection exercise on the stock, trends and characteristics of investments infrastructure at a disaggregated level. This is now partly the objective of the Joint Infrastructure Data Initiative developed by the OECD, the European Investment Bank, the Global Infrastructure Hub, and the Long Term Investor Club and Long Term Infrastructure Investors Association, which was formally launched at the end of 2017 with the support from the G20-OECD Task Force on Institutional Investors and Long-term Financing. The initiative aims to address the issue of establishing infrastructure as an asset class through data collection and improving the availability of infrastructure investment data.

Overview of data sources and limitations

Comprehensive data on investment in infrastructure is lacking as a whole (Wagenvoort, De Nicola and Kappeler, 2010), let alone in specific transport infrastructure sub-sectors.⁷ Available datasets present numerous shortcomings, ranging from limited country coverage and disaggregation levels to a narrow coverage of type and source of investment. The main data sources and limitations are explained below.

National accounts

The measure of gross fixed capital formation (GFCF) is the most often used proxy measure for investments in infrastructure. GFCF data are normally available in a comparative form for a large range of countries from international organisations' databases, such as the IMF, OECD and the United Nations. However, they are hardly reported at a more disaggregated level necessary for the identification of investments in each transport infrastructure sub-sector (airports, ports, railroads and roads), let alone by its institutional sources (i.e. public or private). Most often, data per economic sector is only reported for broad categories (e.g. transport, storage and communications) or at the overall transport sector level when reported under most recent standards, such as the International Standard Industrial Classification (ISIC Rev. 4) or equivalent.⁸

The standard allows for further breakdowns, but only a few countries actually report data with greater granularity. Another relevant issue is that one cannot distinguish between investments in the operation of transport infrastructure assets and transport services (e.g. passenger and freight transport), since both are typically bundled within the "transport and storage" category. Likewise, data availability by the different institutional sources is limited to only a narrow range of countries. Even in these cases caution is required because the rules for reporting under the general government or corporate account are not straightforward (Gonzalez Alegre et al., 2008).⁹

Nonetheless, the information currently available provides for some order of magnitude of investments channelled into transport infrastructures. Figure 1 reports total investment in the transport and storage sector, as well as investments by the general government on transport for the OECD countries for which data were available. In 2015, the median investment in transport and storage was equivalent to 1.64% of GDP, while the median investment by the general government in its transport function was about 1% of GDP. Capital expenditures by the government are reported by government functions and typically include investment related to the construction, maintenance and operation of public infrastructure. The total economy figure, however, includes all GFCF related to the transport and storage sector, including investments in transportation services activities beyond infrastructure structures. As such, these estimates cannot be directly matched, but together they provide some idea of the relative importance of private and public investment in transport infrastructure.

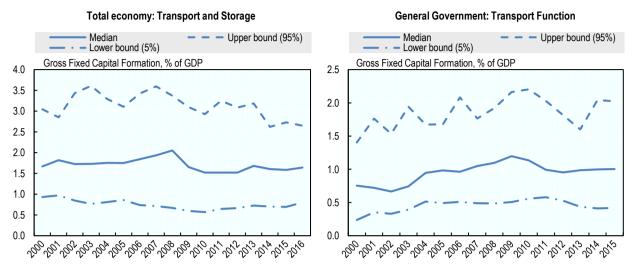


Figure 1. Total and government investment in transport infrastructure in OECD countries from 2000 to 2016

Note: Data for total investments in transportation and storage were available for 18 to 32 OECD countries depending on the year. Data on investments by the general government in the transport function were available for 14 to 24 countries depending on the year. The transport and storage sector includes investments associated with the provision of passenger or freight transport, whether scheduled or not, by rail, pipeline, road, water or air and associated activities such as terminal and parking facilities, cargo handling, storage etc. This section also includes activities related to handling freight immediately before or after transport or between transport segments. The operation and maintenance of all transport structures and facilities is included. Postal and courier activities are also included. Investments by the general government in its transport function refers to capital outlays associated with the administration of affairs and services concerning operation, use, construction and maintenance of grants, loans or subsidies to support the operation, construction, maintenance or upgrading of transport infrastructure systems and facilities.

Source: OECD (n.d.).

Firm-level data

Data on capital expenditures by firms operating in infrastructure sectors are potentially another rich data source for assessing investments in infrastructure assets. There are a few commercial databases that provide such information, allowing one to compile to some extent capital expenditure data by private or state-owned firms at the sub-sector level. However, important drawbacks exist. While capital expenditure (capex) data of publicly listed companies is relatively accessible, information on private companies is generally more difficult to obtain. Additionally, reporting is sometimes limited to the holding company or group unit, which limits the ability to distinguish investments between different business lines and geographical coverage. In transport infrastructure, for instance, it is not uncommon for a company to operate in different transport mode segments, and possibly in multiple countries, which can limit the usefulness of such data for policy analysis.

Project-level data

Project data is likely the closest information to investment in infrastructure that is available at a more detailed level, particularly for private sector participation. Project data is available from a few commercial databases for a large number of projects across the world, with a relatively high degree of detail. It allows identifying projects in specific sub-sectors, as well as their financing structures, contract types and foreign involvement to some extent. The World Bank's Private Sector Participation in Infrastructure database is likely the only publicly available database of this kind. It provides similar information to the commercial databases, but is limited to projects in low- and middle-income countries and regions only.

Project data, however, also has its caveats. It fails to distinguish between private and public capital, although in principle upfront public investments in these projects – to the extent that they are not normally delivered through traditional public procurement methods – are expected to be limited. Nonetheless, public involvement through state-owned enterprises (SOE), public bank financing or other forms of financial support – even to projects owned by private investors – cannot be fully excluded. Moreover, data seems to capture mostly project financed proposals and it is not clear the extent to which it covers transport infrastructure projects financed by other means.

The use of project finance for large-scale infrastructure projects dates back to the 1930s in the US, and back to the 1980s in Europe, and has been used worldwide to support infrastructure financing (Della Croce and Gatti, 2014). It is likely the most common funding structure for large capital-intensive greenfield transport infrastructure projects with relatively transparent cash flows (Izaguirre and Prakash Kulkarni, 2011; Estache, Ellis and Trujillo, 2007). But while the development of project finance has been an important driver behind the increasing number of public-private partnerships in both developed and developing countries, it may cover only a small share of total infrastructure investments in some cases (Wagenvoort, De Nicola and Kappeler, 2010). Traditional corporate financing, for instance, may play an important role in some infrastructure sectors, such as telecommunications, and possibly for financing additional investments in existing projects once operational. There is limited information on the extent to which corporate financing is used in financing capital expenditures in transport sub-sectors.

Another important caveat of such databases is that reported information represents the stock of investments in each project, i.e. the total project capital value, and do not reflect the annual investment flows. Also, the commercial databases do not cover management and lease contracts, as well as traditional public procurement. Finally, data is reported on a voluntary basis by the financial institutions involved in the project transaction. They may therefore lack consistency in the coverage of projects or regions, even though financial institutions have everything to gain by reporting such information, as these are used in widely known deal-making rankings of legal advisors and financial institutions. In fact, a comparison of three available databases within the context of this work revealed rather significant differences in deal coverage.

With such caveats duly noted, the proposed work draws on two commercial databases to profile trends in private investment in transport infrastructure in OECD and non-OECD countries: Dealogic's Projectware database and Thomson Reuters One database, described in detail below.

Dealogic's Projectware database: Project-level data

Dealogic Projectware is one of the most renowned infrastructure project databases available. Several commercial and international organisations, including the World Bank and the European PPP Expertise

Centre with the European Investment Bank, draw on this database for information on private investment in infrastructure. The database contains information on project and trade finance transactions in both developing and developed countries. Information is collected directly from the banks and organisations involved in the deals, and include financial and non-financial information from pre-approval to the financial closure of such projects. The database provides data on the total project amount and their breakdown by financing sources, including loans, equity and bonds. It includes greenfield and brownfield transport infrastructure projects, as well as full or partial divesture by state-owned companies. Lease and management contracts are not covered.

The Dealogic Projectware database was used because it offered a larger deal and country coverage than the other two databases assessed for this project, notably the World Bank's Private Sector Participation in Infrastructure and Thomson Reuters One database. Data from 1995 to 2016 covers 1 765 deals in 111 countries in the following transport sub-sectors: airports, ports, roads (which includes bridges and tunnels) and rail (including railroads, urban mass rail transit and light rail transit systems). The dataset covers both project finance deals and some large non-project finance infrastructure deals. Ordinary corporate financing transactions of infrastructure-related companies are not covered. Appendix 1 presents the spectrum of private participation in infrastructure and its main characteristics. Project data reported here covers essentially those projects implemented through Build-Operate-Transfer (BOT) contracts or other similar contractual structures and concession contracts to some extent, which are normally those with the largest capital commitments. Private participation through the privatisation of identifiable infrastructure assets is also covered.

Thomson Reuters One database: Mergers and acquisitions

The Thomson Reuters One database establishes general trends on the privatisation of state-owned companies operating in the transport infrastructure sector. It provides complete coverage of global mergers and acquisitions. The database tracks changes in economic ownership at the ultimate parent level and all deals involving a purchase of at least a 5% stake (or a 3% stake for disclosed value deals of at least USD 1 million). As with project data, submissions by banking and legal contributors involved in mergers and acquisitions are the source of the database. The database also undergoes extensive research by a global team of dedicated research analysts across a broad range of sources including regulatory filings and corporate statements and reports. It compiles a rich set of transaction information, including pertinent information for tracking private investment in infrastructure sectors, such as the transaction's total value, the nationality of investors and ultimate owners, disaggregated sector classification. It also identifies the types of investors or targets (e.g. state-owned, private or public corporations, sovereign wealth funds, etc.).

For this report, the data provides useful information on global privatisations in transport sub-sectors, as one can identify both total and partial divestures by government-controlled companies in specific sub-sectors. It differs somewhat from the project data in that it captures ownership at the corporate level, whereas Dealogic Projectware mostly captures state divestures of infrastructure assets. The information is treated separately, using Thomson Reuters data only for the purpose of establishing general privatisation trends. Reported data comprises 3 300 merger and acquisition deals from 1995 to 2014 which resulted in ownership by the acquiring company of at least 10% of the shares of the acquired company after the transaction, excluding deals in which the acquirer is a government body or entity in which it owns 50% or more of its capital. The database applies a 10% ownership threshold after the transaction. This is the standard classification of a lasting interest by direct investors in a company as per the OECD Benchmark Definition of Foreign Investment and the IMF Balance of Payments Compilation

Guide. Such ownership level is assumed to give investors an effective voice in the management of the company. Although this level of ownership may not provide investors with any management influence power in the case of privatisations where the state retains a majority control, or a veto interest in the privatised company through a "golden share", it was not possible to identify only those deals where the state has divested fully or held only a minority participation after the transaction.

Only deals in which the target company's primary Sector Industry Classification (SIC) code corresponds to infrastructure transport sub-sectors were included. The SIC code refers to four-digit numerical code assigned by the United States government to business establishments to identify their primary business activity (4581: airports and airport terminal services; 4493 and 4491: marinas and marina cargo handling; 4011, 4013 and 4111, railroad switching and terminal establishments and local and suburban transit; 4785 and 4173: inspection and fixed facilities for motor vehicles and bus terminal and service facilities). Thomson Reuters extends this coding to all companies in the database.

Stylised trends from project-based data

This section draws on both project-based and mergers and acquisitions data from commercial databases to provide evidence of private and foreign participation in transport infrastructure at disaggregated levels. As mentioned above, this report represents a starting point, and by no means provides an exhaustive picture. Caution is required when interpreting the data. For ease of reading, data reported here are termed as "investments in infrastructure", although they actually reflect total project financial commitments and, hence, do not reflect proper investment flows in the normal way one thinks about gross fixed capital formation. In the same manner, cumulative commitments over the period do not represent the stock of investment. Nevertheless, despite the caveats, some suggestive patterns and observations emerge on the basis of this information.

A rise in private investment in transport infrastructure

Private investment in transport infrastructure reached almost USD 1.35 trillion (in constant 2014 PPP terms) between 1995 and 2016, of which OECD countries accounted for USD 673 billion or 50% of the total (Figure 2). Globally, 62% of investments happen in ten countries: the United Kingdom, Australia, the United States, Spain, Turkey, Korea and France are responsible for 64% of total investments in OECD countries, while China, India and Brazil account for 61% of total investments in non-OECD countries.

In the early 2000s, private investment in transport infrastructure was mostly concentrated in OECD countries (Figure 2). Yearly investment in these countries increased almost five times between 2000 and its pre-crisis peak in 2006. Non-OECD countries, on the other hand, only began to significantly attract private investments in transport infrastructure in the mid-2000s. Governments' increased interest in private sector participation in transport infrastructure has been a major driving force behind such trends in both OECD and non-OECD countries.¹⁰ The possibility of raising debt off-budget for infrastructure projects when delivered through public-private partnerships may likely have added an important push to this trend, despite the inherent risks of this approach to financial discipline and transparency (Hammami,

Ruhashyankiko and Yehoue, 2006). But this may not be entirely sufficient to explain the trend, as some of the biggest users have been relatively transparent about them.

Private investments in transport infrastructure rebounded from crisis-related slowdown

The global financial crisis put a strain on private infrastructure investments in both groups of countries, but more pronouncedly so in OECD economies. Traditional long-term bank-financing for infrastructure projects dropped off considerably in the immediate aftermath of the crisis as notable participants in the global project finance market, such as the European banks, struggled to recover (World Bank, 2013; Burger et al., 2009).¹¹ Domestic banks active in other important PPP markets, such as Canada and Australia, were also affected to some extent, but considerably less so (PWC, 2013; KPMG, 2015). Stricter banking regulations following the crisis may also have contributed to limited bank financing for such projects, although general market uncertainty and adjustment of expectations may have had a more determinant impact, as these measures were not implemented overnight.¹² The cost of bank financing increased with bank deleveraging: average credit spreads increased from 50-150 base points (BPS) before the crisis in Europe to 225-300 BPS (Blackrock, 2014).¹³ But harsher financing conditions have not acted alone in constraining investments in infrastructure projects. Infrastructure-related companies, too, seem to have hoarded cash after the crisis and refrained from undertaking long-term investments; and this, despite the current low-interest rate environment (Blundell-Wignall and Roulet, 2013).

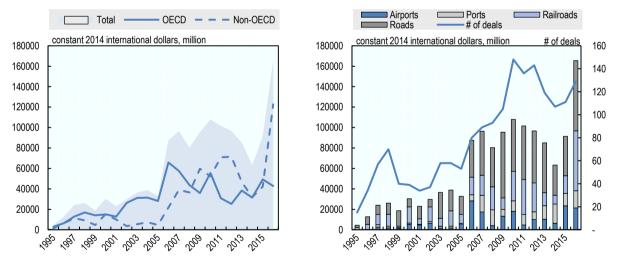


Figure 2. Evolution in private investment in transport infrastructure by country type and sub-sector from 1995 to 2015

Note: Project data is available for 31 OECD countries and 80 non-OECD countries, although total project amounts are available for only 77 of the non-OECD countries. Only projects reaching financial closure are included, and the date refers to the financial close date. Refinancing deals were excluded. Data do not cover infrastructure service contracts (e.g. management and lease contracts). Transactions are reported in US dollars (million) in the database (transactions not denominated in US dollars are converted by Dealogic to US dollars at the loan agreement signing date), and were converted to constant 2014 international dollars using purchasing power parities and the growth of GDP in constant local currency units from the World Bank Development Indicators database, complemented by the IMF's World Economic Outlook database when not available. Transport infrastructure sectors refers to Dealogic's classification: airport; bridge, road and tunnel (roads); rail infrastructure and urban railway/LRT/MRT (railroads); and port. Projects are assumed to be private, although they may involve some public investment. Data on the share of public investment (if any) in these projects are not available.

Source: Dealogic (n.d.).

In OECD countries, the effect of the crisis was immediate and substantial. By 2009, private investment in infrastructure had dropped to half of the investment level seen during the pre-crisis peak in 2006. Nonetheless, investment levels in the period following the crisis remained higher than in the late 1990s and early 2000s. In non-OECD countries, the immediate effect of the crisis was much less pronounced. It was not until 2012 that private investment in transport infrastructure declined substantially as economic conditions deteriorated in large emerging economies too.

The average deal size tends to follow a similar pattern across OECD and non-OECD countries overtime. In both groups deal sizes tended to increase until the crisis. Since then, relatively smaller projects have succeeded in securing financing as the average deal sizes shrank during the 2011-2016 period. The crisis effect aside, the previous growth in average deal sizes partly demonstrates increased confidence and appetite for large PPP transport projects by both governments and private sector participants. Across sub-sectors and throughout the entire period, the largest average deal size is observed in airports and in the railroad sector. This pattern holds in both OECD and non-OECD countries, albeit inversely ordered. It resonates to some extent both the capital-intense nature of railroad projects and the architectural-signature nature of airport projects, which can sometimes go beyond its mere transport functionality. The roads sector shows the lowest variation in the average deal size over the entire period, remaining relatively stable in OECD and non-OECD countries. Average deal sizes in roads and ports sectors were also fairly equal across both groups of countries, whereas they differed substantially for railroads, and airports to a lesser extent.

In all, OECD and non-OECD countries present little difference in terms of the sub-sectoral distribution of private investments flowing into transport infrastructure. Roads and railroads have attracted the largest amount of investment during the period 1995-2016, accounting for 48-50% and 25-30% of total investments respectively. The rest was almost evenly distributed between airports and ports in non-OECD countries, and mostly dominated by airports in the case of OECD countries. This comes as no surprise as the potential number of road projects in a country and the average size of rail projects tend to be greater than in other sectors.¹⁴ The large amount of private investments in railroads in non-OECD countries was, however, mostly driven by projects in a few large emerging economies, such as China, India and Malaysia.

Attracting private investment into road infrastructure in non-OECD economies

When looking at private investments as a share of GDP, differences emerge across the OECD and non-OECD country groups (Figure 3). To begin with, total private investment in transport infrastructure has been relatively more important in OECD countries, although the difference is not statistically significant.¹⁵ On average, the stock of private investment between 1995 and 2016 as a share of 2014 GDP at PPP prices amounted to 2.3% in OECD and 1.8% in non-OECD countries. Higher per capita income levels and relatively higher institutional maturity in OECD countries may allow for more predictable conditions for private investors to assume the risks these projects entail. Evidence suggests that private investment in infrastructure is highly related to a country's sovereign risk rating, much more than overall foreign direct investment, for instance (Araya, Schwartz and Andres, 2013).

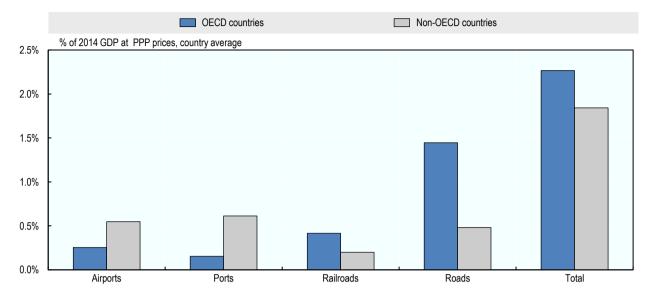


Figure 3. Private investment as a share of GDP in OECD and non-OECD from 1995 to 2016

Note: It is assumed that the 31 OECD and 77 non-OECD countries for which project amount data is available in the Dealogic's database are those who allow and are willing to attract private investments in infrastructure. This is assumed to be the case across transport sub-sectors, *i.e.* if a government decided to contract a project to private investors in at least one sector in the observed period, it is assumed that such a government would in principle be willing to do the same across all transport sub-sectors. The absence of a deal in one sub-sector is therefore interpreted as absence of investments in that sub-sector; not a legal impossibility neither lack of data. Levels of investments are interpreted as both a reflection of the potential room for private investment and conditions for such investment to take place. In this sense, relatively lower levels of private investment are seen as both a consequence of limited potential for private investment, for instance due to affordability or value for money issues, and/or a consequence of deficient conditions for such investments to occur. The opposite is assumed for relatively higher levels of investment. See also the notes to Figure 2 for further data-related information.

Source: Dealogic (n.d.) and World Bank (n.d.).

Most notably, the sectoral distribution of private investment in transport infrastructure has been distinct across OECD and non-OECD countries in relative terms. This is partly due to the different underlying economic conditions between investments in each transport sub-sector and across the two groups of countries (Figure 3). Investments in the road and railroad sectors have been more prevalent in OECD countries, with investments in the road sector being three times more important relative to GDP than in non-OECD countries on average. Conversely, in non-OECD countries it has been relatively more important in airports and ports than in the other sub-sectors. Only a few large emerging economies and some more developed non-OECD countries have actually managed to attract capital into railroads. This may be evidence of a more limited scope for railroad projects in a number of countries, where rail transport may have been historically less prominent and economic conditions relatively more prohibitive. Railways are difficult to implement anywhere, often requiring heavy institutional support, which may be more difficult to secure in less developed economies.

A growing demand for air travel, which has historically outpaced economic growth, has sparked private investors' interest in airport assets (Andrew and Dochia, 2006). The observed differences also suggest that the airport and port sectors may have been more easily reformed with a view of introducing appropriate regulatory governance and price structures, providing greater certainty to investors. In the airport sector, for instance, a number of countries have introduced independent regulators and

privatised or corporatised incumbent state-owned providers. Liberalisation of air traffic has also boosted demand for air transport (Gillen, 2007). In addition, user funded projects and services likely face less political pressure to maintain those provided and funded by the state. As Estache, Ellis and Trujillo (2007) argue, transport infrastructure where the end-user is a corporate or commercial client – such as airports, ports and cargo railways – tends to be less risky given the customers' relatively higher payment capacity.

However, regulatory reforms for roads seem to have been less compelling, even in some OECD countries, at least in terms of regulatory governance. Several countries lack independent regulatory governance structures in the sector (Sutherland et al., 2011), a sector which is more likely to be subject to social and political pressures to keep tariffs low (Estache, Ellis and Trujillo, 2007). This may explain, in part, the higher incidence of cancelled or distressed projects in the road sector in developing economies than in other sub-sectors, as indicated by the World Bank Private Sector Participation database.

Rise in private participation in transport infrastructure mirrors global trend

Privatisation¹⁶ reflects a partial or full divesture by a government entity of its equity in a state-owned company, either through an asset sale, public offering or privatisation programme. It does not necessarily entail investment in the construction and refurbishment of infrastructure assets by the private sector, as is usually the case with public-private partnerships projects. It Private investors who enter into privitisations expect to extract higher returns from the acquired assets by their ability to reduce costs or increase revenues, and hopefully both, (e.g. through better demand management and further real estate developments). However, depending on regulatory requirements in place, this does not necessarily exclude the potential for a growth strategy and expansion of infrastructure. It represents, thus, an important channel through which the private sector can potentially raise efficiency in infrastructure delivery.

Since the privatisation of transport infrastructure peaked in the late 1990s in OECD and non-OECD countries, it declined drastically in value and number in OECD countries during the 2000s (Figure 4).¹⁷ In non-OECD countries, privatisations which had also declined in the early 2000s, started to recover already in the mid-2000s. Since 2010, however, privatisation has risen in both groups. From 2011 to 2014, privatisations represented 24% and 36% of the transport sector deals in value terms in OECD and non-OECD countries respectively. This, opposed to 8% and 13% respectively in the 2006-2010 period. In OECD countries, this is mostly due to a few large deals in a limited number of countries. In non-OECD countries, a few large deals are also behind the rise in privatisations in the period, but the number of privatisation deals has also risen since early 2000s.

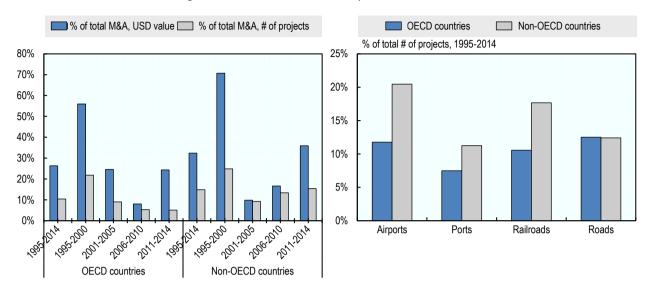


Figure 4. Privatisations in transport infrastructure

Note: Data comprise 3300 M&A deals from 1995 to 2014, which resulted in the ownership by the acquirer company of at least 10% of the shares of the acquired company after the transaction, excluding deals in which the acquirer is a government body or entity that is 50% or more owned by the government and is not publicly traded. Only deals in which the target company's primary Sector Industry Classification corresponds to infrastructure transport sectors were included (4581 – airports and airport terminal services; 4493 and 4491 – marinas and marina cargo handling; 4011, 4013 and 4111 – railroad switching and terminal establishments, railroad switching and terminal establishments and local and suburban transit; 4785 and 4173 – inspection and fixed facilities for motor vehicles and bus terminal and service facilities). Data, however, needs to be interpreted with caution as only 53% the registered deals contain information on the transaction value.

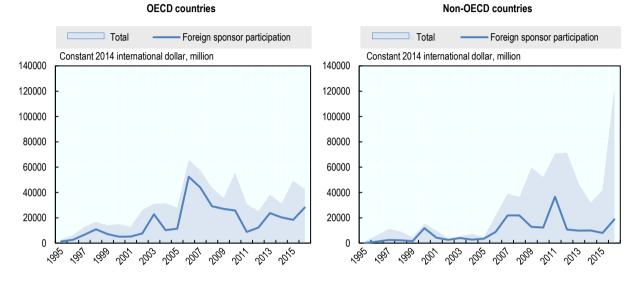
Source: Thomson Reuters (n.d.).

The sectoral distribution of privatisation differs somewhat between OECD and non-OECD countries, as illustrated in the second graph of Figure 4. Non-OECD countries have more prominently privatised airport and railroad assets. This holds true in value terms, too. In OECD countries, privatisations were more evenly distributed across transport sub-sectors, with road assets being slightly higher in value terms and ports at the lower end. But in number of deals, roads and airports have been the most active sectors, followed by railroads and ports respectively. The relative uptake in airport privatisations partly reflects governments' fiscal constraints, which has enticed them to sell off assets (PWC, 2013). The privatisation trend, however, is unlikely to be confined to Eurozone countries.

Foreign investment plays larger role in OECD and non-OECD countries alike

Participation by foreign investors in transport infrastructure projects has been significant across OECD and non-OECD countries (Figure 5). They can often mobilise international resources, both financial and managerial, that are not readily accessible to domestic investors. With those resources, foreign investors are usually well positioned to undertake and manage the characteristics of typically long-term, large scale infrastructure projects that involve complex contractual and financial structures. From 1995 to 2016, foreign sponsors were involved in projects totalling 57% of investments in transport infrastructure in OECD countries and 31% in non-OECD countries (49% and 28%, respectively, in terms of number of projects).⁽¹⁸⁾⁽¹⁹⁾ Unfortunately, the available data does not allow for distinguishing between the share of

foreign and domestic investors in each project, and thus neither is the precise amount of investment by foreigners in transport infrastructure. Nonetheless, the relatively high share of projects involving foreign sponsors attests to their importance in infrastructure markets.





Note: Foreign sponsor participation refers to the involvement of one or more foreign companies holding a stake in the project company carrying out the project, generally by providing financial support through an equity injection. See also notes to Figure 2 for further data-related information.

Source: Dealogic (n.d.).

Domestic sponsors are, nonetheless, playing an increasing role in infrastructure projects, most notably in the large emerging non-OECD countries, as shown in the second graph of Figure 5. The importance of foreign investors to infrastructure projects has been given a prominent role in the infrastructure debate. As large-scale projects often surpasses a country's financing capacity, it must depend on both foreign debt and equity financing to some extent. In the early 2000sit was relatively common for infrastructure projects to largely rely on foreign equity sponsors. In non-OECD countries, transport infrastructure projects with foreign sponsor participation represented almost 60% of total project value and 70% in terms of number of deals reaching financial closure in the period. But since the boom of private investment in infrastructure in the mid-2000s in these countries, domestic sponsors have become more prominent. From 2006 to 2010, investments in projects with only domestic sponsors amounted to ten times the amount observed in the previous five-year period.

Foreign participation in transport sub-sectors differs across OECD and non-OECD countries

The share of foreign sponsor participation across transport sub-sectors also reflects some distinct characteristics of the two country groups. In OECD countries, foreign sponsor participation has been relatively greater in the ports and roads sub-sectors (Figure 6). In non-OECD countries, however, foreign sponsor participation has been the lowest in the roads sectors. Foreign sponsors have been more involved in airport and ports projects, although this may vary considerably across countries.

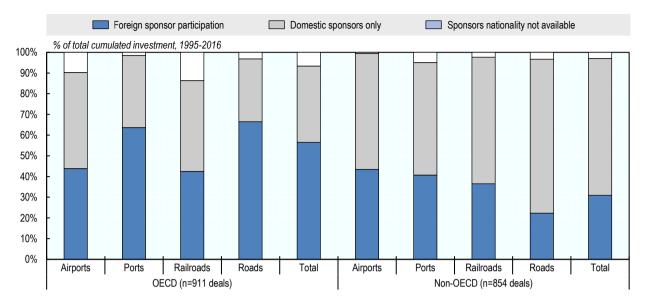


Figure 6. Foreign investment in transport infrastructure by sub-sector

Note: The white column range refers to the total project amount of deals for which information on the sponsors nationality is not available in the database. In total, roughly 9% of the projects, corresponding to 5% of total project amount, do not contain information on the nationality of the sponsor. See also notes to Figure 2 for further data-related information.

Source: Dealogic (n.d.).

Again, this may reflect more difficult economic conditions for private investments in the road sector in non-OECD countries in general, particularly when the transition to private provision of such infrastructure projects is associated with the introduction of "user pay" systems for services which were previously perceived by the population as "free" (Estache, Ellis and Trujillo, 2007). Potentially greater political and social sensitivities of such projects may turn away foreign investors more pronouncedly than domestic ones. Local preconceived ideas about a foreign investor may also make such projects more challenging. In addition, projects with foreign sponsors may rely relatively more on foreign financing, increasing their exposure to currency fluctuations when revenues are earned in local currency (Harris and Pratap, 2009). The roads sector would feel the impact of this more than other transport sectors, as the revenue structure is often established in hard currency. Evidence shows that, for any of these reasons, projects with foreign sponsor participation are more prone to cancellations (Harris and Pratap, 2009).

Financing for long-term infrastructure projects rebounds post-crisis

Long-term infrastructure projects are no longer hindered by the lack of investment that crippled them after the 2008 global financial crisis (Freshfields Bruckhaus Deringer, 2014; PWC, 2014). The liquidity dryup following the crisis in the traditional bank-financing market for infrastructure has mostly reversed. Current market conditions are characterised by strong bank liquidity across most infrastructure market segments, notably in OECD countries (BNP Paribas, 2015). Interest rates have held at historical lows and banks' financial and capital positions have improved. Freshfields Bruckhaus Deringer (2014) highlights that there are more banks in the market now than two years ago, and that the shortage of sound projects in the pipeline, both greenfield and brownfield, is holding back greater investment levels. PWC (2014), however, notes that although liquidity has returned, the financing conditions are relatively different from those observed before the crisis, with relatively shorter tenors, higher margins and more restrictive covenants, all of which have important potential implications. Shorter maturities, for instance, increase refinancing risks, and higher margins may make some projects unviable, placing increased needs on the government to bridge financing gaps. In this respect, the crisis may have allowed for an adjustment of expectations and appreciation of such projects by investors. In the past, project finance had been extended to a variety of sectors and projects, sometimes with only limited understanding of the risks entailed. After the crisis, emerging evidence seems to suggest a significant shift in the risk profile of projects reaching financial closure, at least in the largest OECD transport PPP markets, with almost solely availability-payment projects recovering and competition from long-term institutional investors strengthening, financing conditions in the most competitive markets began to improve again in 2015, driving down margins in some cases and permitting longer tenors once again to be achieved (BNP Paribas, 2015). In some segments of the market at least, this may reflect the fact that projects coming to surface entail lower risks to investors, as mentioned above (Makovšek, 2019).

The availability of other non-bank sources of capital, such as insurance companies and private equity funds, has also increased, partly reflected in the levels of capital raised by unlisted infrastructure funds. Based on data from Preqin, Freshfields Bruckhaus Deringer (2014) reports an all-time high in 2014 with 149 funds in the market targeting USD 90 billion in capital commitments. In the current context of low interest rates, institutional investors and asset managers have increasingly sought out higher yield investment opportunities and diversification, particularly where they can match their longer duration or inflation-linked obligations (e.g. pension funds and life insurance companies). Infrastructure funds provide them with an opportunity to invest equity into a wide range of infrastructure projects with the aim to diversify the bulk risk of individual projects.

However, despite increasing appetite, only a fraction of institutional assets are being channelled into infrastructure. In OECD countries, for instance, institutional investors hold about USD 83 trillion in assets under management, but only about 1% is currently allocated to direct infrastructure assets. In emerging markets, too, institutional investors are building large assets bases, but investment trends often follow the same pattern (Della Croce and Gatti, 2014).

Bond financing recovers strongly after the crisis

Following similar trends in the financial industry, bond financing for transport infrastructure projects has recovered strongly in recent years (Figure 7). It had shrunk considerably in the years following the financial crisis, partly due to the demise of monoline insurance companies during that period (Della Croce and Yermo, 2013).²⁰ In principle, bond financing is a natural and economically appropriate financing instrument for infrastructure projects, notably for their operational phase.²¹ Bond issues are normally larger and offer longer maturities than typical bank loans, allowing debt service costs to extend over longer periods, reducing refinancing risks and better matching the long-term nature of infrastructure assets.

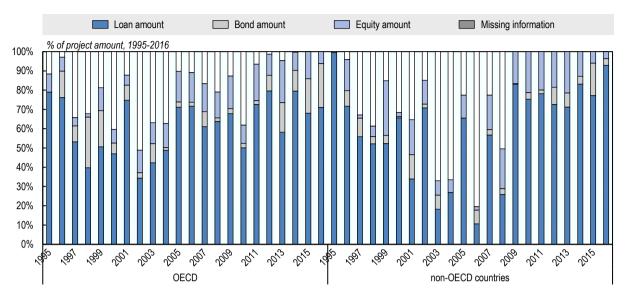


Figure 7. Financing structures in OECD and non-OECD countries

Note: The white column refers to the total amount of deals for which information on the financing structure is not available in the database. See also notes to Figure 2 for further data-related information.

Source: Dealogic (n.d.).

Bond financing has particularly increased in recent years in OECD countries (albeit mostly specifically in Australia, Canada, the United States and the United Kingdom) where deeper capital markets exist and institutional investors and asset managers have increasingly sought out higher yield investment opportunities and diversification. Between 2011 and 2016, bond financing accounted for 13% of transport infrastructure financing in OECD countries, compared to only 3% in the 2006-2010 period.

The current uptake in bond financing also suggests that some institutional investors are increasingly more comfortable assuming risks they would generally not have before (e.g. construction risk). Construction-related risks, such as cost overruns and delays, which have often scared investors away, seem to be limited and diversifiable from the view of point of investors in the project company (Blanc-Brude and Makovsek, 2013). The uptake may also reflect, to some extent, credit enhancement solutions put in place recently by development banks and multilateral agencies, such as the European Investment Bank's Project Bond Credit Enhancement Initiative, which have likely helped to enhance projects' credit quality and address investors' concerns (Freshfields Bruckhaus Deringer, 2014).

The increased role of export credit agencies in infrastructure financing

Since the crisis, export credit agencies (ECA) have also stepped up and are playing an increasingly important role in the financing of large infrastructure projects, notably in greenfield projects in emerging economies (Ehlers, 2014). For projects in Africa, in particular, their involvement has been crucial to securing project financing (Baker and McKenzie and IJGlobal, 2014). In other regions, including in the Middle East and Asia, the number of projects relying to some extent on support from ECA has grown substantially in recent years, though their involvement has been more limited in terms of deal values. ECAs are also becoming more involved in unwinding traditional bank finance for infrastructure projects.

Banks are allowed to allocate lower levels of capital to ECA-backed projects, which has led to a push for greater ECA coverage and ECA direct financing in infrastructure markets, including, to some extent, in advanced economies (Rhoades, 2012; Ehlers, 2014).

Project refinancing levels soar

Project refinancing is a common characteristic of long-term infrastructure projects. Their financing structure and terms are normally contracted at financial closure based on the market conditions at the time. Traditional bank financing, however, is typically only available at shorter maturities than the project's full lifecycle. In addition, a project's risk profile evolves during its lifecycle (e.g. after construction phase) and market conditions may change. The project company may, therefore, wish to refinance in order to benefit from potentially improved market conditions (e.g. longer maturities or reduce interest costs). Potential benefits of refinancing can include lower overall costs for users and the government and higher returns to investors, but it does not itself lead to additional investment by the project. As refinancing can sometimes lead to changes in the composition of capital structure and financiers, contracts normally require consent from the contracting authorities and regulate the conditions for sharing any potential gains among the project company and the contracting authority.

Refinancing in OECD countries has intensified notably since 2010 with the current low-interest rate environment (Figure 8). Moreover, according to J.P. Morgan (2011), a large amount of debt raised to finance infrastructure assets in the years before the global financial crisis was estimated to have five- to seven-year terms. This implies that all or part of the existing debt would need to be refinanced at the end of such periods anyway. Project bonds have notably provided an alternative pool of liquidity for refinancing in this context, and particularly in view of banks' constraints in providing long-term finance. In OECD countries, from 2011 to 2016, roughly 40% of transport infrastructure deals constituted refinancing, compared to only 15% in non-OECD countries. Non-OECD countries saw a peak in 2010 due to a few large refinancing deals. It rose again in 2014 and 2015, but remains a minor phenomenon.

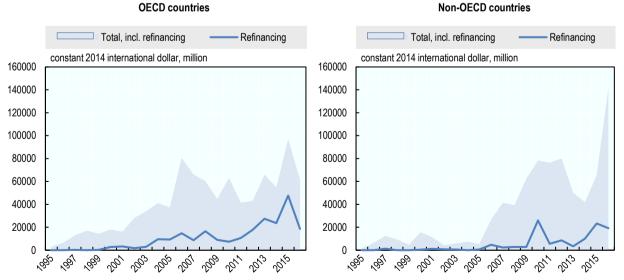


Figure 8. Total and refinancing amounts for transport infrastructure projects between 1995 and 2016

Note: See notes to Figure 2 for further data-related information.

Source: Dealogic (n.d.).

Conclusion

This report has provided initial evidence on how private and foreign investment has been channelled into different transport infrastructure sub-sectors across OECD and non-OECD countries. It represents a first attempt to quantify private and foreign investment in transport infrastructure at more disaggregated levels in a large range of countries, and by no means provides an exhaustive picture. It is original in that it provides for a first description of foreign participation in transport infrastructure. The report also highlight that informed policy-making in both OECD and non-OECD countries is severely constrained by the dearth of relevant and readily available data on public and private investment in infrastructure sub-sectors. At present, more data are available for developing countries through the World Bank's Private Sector Participation database than for OECD countries.

Further work is required to collect data on the level and characteristics of private and public investments in transport infrastructure at a disaggregated level. Such data would make it possible to investigate pertinent questions for policy-making, ultimately enabling the empirical assessment of different policies and incentive frameworks for private participation. The OECD is uniquely placed to launch a systematic data collection exercise on the stock, trends and characteristics of investments infrastructure at a disaggregated level. This is now partly the objective of the Joint Infrastructure Data Initiative developed by the OECD, the European Investment Bank, the Global Infrastructure Hub, and the Long Term Investor Club and Long Term Infrastructure Investors Association, which was formally launched at the end of 2017 with the support of the G20-OECD Task Force on Institutional Investors and Long-term Financing. The initiative aims to address the issue of establishing infrastructure as an asset class through data collection and improving the availability of infrastructure investment data.



1 The greatest beneficiaries from investment in transport infrastructure are likely to be developing countries. Evidence suggests that such investment induces greater economic growth and reduces income inequality and regional disparities within those countries. In developed economies the impacts are generally much smaller since the transport networks are mainly built out, meaning that infrastructure investment to a larger extent goes into improving what is already there (e.g. addressing bottle necks or improving quality) (Estache and Garsous, 2012).

2 A lack of financing is most likely not what is preventing the government and the private sector from bridging the remaining investment gap. While more stringent financial regulations imposed after the 2008 financial crisis may have limited the availability of traditional long-term bank-financing for infrastructure in the crisis aftermath to some extent, it no longer seems to be a barrier. Moreover, long-term institutional capital may be well placed to fill some of the needs. In OECD countries, for instance, institutional investors hold about USD 83 trillion in assets under management, but only about 1% is currently allocated to direct infrastructure assets. In emerging markets, too, institutional investors are building large assets bases, but investment trends often follow the same pattern (Della Croce and Gatti, 2014). In addition, evidence suggests that infrastructure companies have been hoarding cash since the crisis and refraining from undertaking long-term investments, despite the low-interest rate environment (Blundell-Wignall and Roulet, 2013).

3 For ease of reading, the terms "private investment" and "private participation" are used interchangeably to describe the project-based data used, although these do not adequately reflect gross fixed capital formation data. The distinction between private investment and private participation is treated in Makovšek (2019).

4 Empirical work conducted at the OECD attests to the costs of such renegotiations for road concessions in Latin America. The findings suggest that weak State institutions, unclear legislation and deficient contract design have allowed for frequent and costly renegotiations in the countries analysed. Renegotiations initiated by the state, which were more common than firm-led renegotiations, were often associated with the political cycle. It is estimated that renegotiations occurred on average only two years after the signing of such contracts, and the average contract is renewed annually. The direct fiscal costs of such renegotiations were worth USD 7 billion. Other costs included average increases in concessions' terms by 20%, higher toll prices, greater risks faced by the State and delays in construction deadlines (Bitran, Nieto-Parra and Robledo, 2013; OECD/CAF/UN ECLAC, 2013).

5 "Project finance is the financing of long-term infrastructure [...] and other projects / public services based upon a limited recourse financial structure where project debt and equity used to finance the project are paid back from the cash flow generated by the project (typically, a special purpose entity (SPE) or vehicle (SPV))." (Della Croce and Gatti, 2014)

6 According to data from the World Bank Private Participation in Infrastructure database, lease and management contracts represent less than 1% of investment commitments in infrastructure transport projects across sub-sectors from 1990 to 2014, with the exception of airports where they are relatively more important and represent roughly 8%.

7 Wagenvoort, De Nicola and Kappeler (2010) draw on existing public national account statistics and commercial project-based databases to estimate the relative importance of private and public investment into infrastructure. While their methodological approach is insightful for the overall level of investment in infrastructure sectors, the level of disaggregation achieved through their methodology is unfortunately limited to the level of disaggregation available in national accounts. It is thus impossible to replicate it at more disaggregated transport sub-sector levels, for instance, as official statistics are not available.

8 In several countries, national account statistics are still reported following the International Standard Industrial Classification (ISIC Rev. 3.1) of economic activities, which does not provide for greater disaggregated information. Several OECD countries have already adopted the newer ISIC Rev. 4 classification, which provides for further breakdowns. However, the availability of reported data remains limited with regards to investment in transport.

9 Under the current system of national accounts rules, investments by state-owned enterprises are classified under the corporate sector if these entities charge market prices or prices that cover more than 50% of costs. Otherwise, they are classified under the general government sector.

10 At the onset, the decision to award an existing or new infrastructure to a private party remains essentially with the government. This partly explains, for instance, the relatively higher levels of private participation in roads within some OECD countries, such as France, Italy and Portugal, which have largely opted for highway concessions to the private sector, compared to the levels observed in Germany, which have kept most of the network in the public sector (ITF, 2008).

11 European banks accounted in the past for the largest share of the global project finance market, but have scaled back since the crisis (OECD, 2013). Historically, they have played a significant role in the syndication of bank financing for large infrastructure projects in emerging and developing economies (World Bank, 2013), but also to some other important developed PPP markets, such as Canada (Woodman, 2006; PWC, 2013).

12 Under Basel III, tighter regulatory capital requirements have been specified. Banks are now required to allocate greater percentage of their liquidity to back long-term commercial debt financing.

13 Credit spreads have been very stable over the last 12 years, trending higher in the last three as funding banks have recognised the need for higher margins to compensate for higher capital requirements under Basel II and III regulations (BlackRock, 2014).

14 The number of road projects during the period accounts for roughly 56% of total projects. The remaining projects were distributed relatively evenly across the other transport sub-sectors. The average railroad project was almost 2.3 times greater than the average port project, 1.8 times greater than the average road project and roughly 1.3 times greater than the average airport project.

15 A two sided t-test with unequal variance and a Wilcoxon rank sum test were performed to check if differences in means and magnitudes across OECD and non-OECD countries were significant at a 5% significance level. It revealed that the differences in means and values across both groups of countries are significant in the roads and railroads sectors only.

16 Privatisations reported here comprise all M&A deals which resulted in the ownership by the acquirer company of at least 10% of the shares of the acquired company after the transaction. This follows the standard definition of lasting interest by international organisations, such as the OECD and IMF. Therefore, deals where private investors have sought a stake of 10% or more of the voting capital, but the government continues to retain a controlling interest through majority-ownership or "golden shares", are counted as privatisations, despite the private sector's limited role in the management of the company. Although the private sector's potential to raise the efficiency level of a privatised company comes mostly in the cases where government has divested to a minority shareholding level, these deals could not be screened in the database.

17 These figures must be considered with caution as the quality of the data is uncertain, notably for the early periods. Data is based on Thomson Reuters – Thomson One M&A database. It comprises 3 300 M&A deals from 1995 to 2014, where the acquirer company gained ownership of at least 10% of the shares of the acquired company after the transaction (as per the standard foreign direct investment definition). However, this excludes deals in which the acquirer is a government body or an entity that is 50% or more government-owned and is not publicly traded. Only deals in which the target company's primary Sector Industry Classification corresponds to infrastructure transport sectors were included. That said, only 53% of the registered deals contain information on the transaction value.

18 Sponsors refer to the company, or group of companies (in the case of a consortium), bidding to carry out the project, generally providing financial support through an equity injection if successful.

19 The shares are estimated based on the number of projects for which data on sponsor nationality is available. Information is missing for less than 9% of the projects and less than 7% in terms of value.

20 Until the crisis it was common for infrastructure project bonds to be secured by some sort of credit enhancement mechanisms, most notably by insurance provided by highly rated monoline insurance companies (Della Croce and Gatti, 2014).

21 Once operational – i.e. after construction – infrastructure projects are said to provide relatively stable cash flows, and default risks generally decline overtime. In contrast, risk is higher in the initial phase and debt restructurings are relatively more common during the construction phase. Bank finance is thus more appropriate at this stage as banks can more easily restructure existing loans, but their short-term liabilities inevitably limits the maturity of assets they can safely hold. As such, bonds tend to come into play when initial bank loans are being refinanced as projects enter the operation phase (Ehlers, 2014). After 5 years, cumulative default rates of investment-grade infrastructure bonds are much lower than of non-financial corporate issuers (Moody's Investors Service, cited in Ehlers, 2014). Bitsch, Buchner and Kaserer (2010) also find that default risk is significantly lower in infrastructure investments than in non-infrastructure investments. However, the authors do not find evidence of greater cash flow stability of infrastructure. investments as normally advocated.

References

Andrew, D. and S. Dochia, (2006), "The growing and evolving business of private participation in airports: New trends, new actors emerging", *GridLines*, Brief no. 37551, Note no. 15, PPIAF, The World Bank, Washinton, DC, <u>http://documents.worldbank.org/curated/en/916861468158995504/The-growing-and-evolving-business-of-private-participation-in-airports-new-trends-new-actors-emerging</u>.

Araya, G., J. Schwartz, and L. Andres (2013)," The effects of country risk and conflict on infrastructure PPPs", *The World Bank Policy Research Working Paper*, No. WPS6569, The World Bank, Washington, D.C, <u>http://documents.worldbank.org/curated/en/241991468159603304/The-effects-of-country-risk-and-conflict-on-infrastructure-PPPs</u>.

Bain, R. (2009), "Error and optimism bias in toll road traffic forecasts", *Transportation*, Vol. 36/5, pp. 469–482, Springer US, <u>https://doi.org/10.1007/s11116-009-9199-7</u>.

Baker and McKenzie and IJGlobal (2014), "Global update and Africa focus: Export credit and development finance", <u>https://www.bakermckenzie.com/-/media/files/insight/publications/2014/09/global-update-and-africa-focus-export-credit-and</u>/files/read-publication/fileattachment/ arfc bf exportcreditreport sep14.pdf (accessed on 12 March 2019).

Basilio, M. (2011), "Infrastructure PPP investments in Emerging Markets", Paper presented at the European Financial Management Association, 2011 Annual Meeting, Braga, <u>www.researchgate.net/</u>publication/265219817_Infrastructure_PPP_investments_in_Emerging_Markets.

Bitran, E., S. Nieto-Parra and J. Robledo (2013), "Opening the Black Box of Contract Renegotiations: An Analysis of Road Concessions in Chile, Colombia and Peru", *OECD Development Centre Working Papers*, No. 317, OECD Publishing, Paris, <u>https://doi.org/10.1787/5k46n3wwxxq3-en</u>.

Bitsch, F., A. Buchner and C. Kaserer (2010), "Risk, Return and Cash Flow Characteristics of Infrastructure Fund Investments", *EIB Papers*, Vol 15/1, pp. 106-136, European Investment Bank.

BlackRock (2014), "Infrastructure debt: Answers to four common questions", BlackRock Infrastructure Investment Group, <u>www.blackrock.com</u> (accessed on 19 January 2016).

Blanc-Brude, F. and D. Makovsek (2013), "Construction Risk in Infrastructure Project Finance", *EDHEC Business School Working Paper*, EDHEC Business School, www.researchgate.net/publication/236007050 Construction risk in infrastructure project finance.

Blundell-Wignall, A. and C. Roulet (2013), "Long-term investment, the cost of capital and the dividend and buyback puzzle", OECD Journal: Financial Market Trends, Vol. 2013/1, https://doi.org/10.1787/fmt-

Burger, P. et al. (2009), "The Effects of the Financial Crisis on Public-Private Partnerships", *IMF Working Paper*, No. WP/09/144, International Monetary Fund, New York, <u>www.imf.org/external/pubs/ft/wp/</u>2009/wp09144.pdf.

Dealogic (n.d.), Dealogic ProjectWare (database), <u>www.dealogic.com</u> (accessed on 19 January 2016).

2013-5k41z8t05l8s.

Della Croce, R. and J. Yermo (2013), "Institutional Investors and Infrastructure Financing", *OECD Working Papers on Finance, Insurance and Private Pensions*, No. 36, OECD Publishing, Paris, <u>https://doi.org/10.1787/5k3wh99xgc33-en</u>.

Della Croce, R. and S. Gatti (2014), "Financing infrastructure – International trends", *OECD Journal: Financial Market Trends*, Vol. 2014/1, <u>https://doi.org/10.1787/fmt-2014-5jxvpb4jfrf1</u>.

Ehlers, T. (2014), "Understanding the challenges for infrastructure finance", *BIS Working Papers*, No. 454, Bank for International Settlements, Basel, <u>www.bis.org/publ/work454.htm</u>.

Engel, E., R. Fischer and A. Galetovic (2009), "Public-Private Partnerships: When and How", *Documento de Trabajo*, No. 257, Centro de Economía Aplicada, Universidad de Chile, Santiago, <u>http://econ.uchile.cl/uploads/publicacion/c9b9ea69d84d4c93714c2d3b2d5982a5ca0a67d7.pdf</u>.

Estache, A., J. Ellis, and L. Trujillo (2007), "Public-private partnerships in transport", *Policy Research Working Paper*, No. 4436, World Bank, Washington, D.C., <u>http://documents.worldbank.org/curated/en/255351468134395315/Public-private-partnerships-in-transport</u>.

Estache, A. and G. Garsous (2012), "The impact of infrastructure on growth in developing countries", *IFC Economics Notes*, Note 1, International Finance Corporation, Washington, D. C., <u>https://www.ifc.org/wps/wcm/connect/054be8804db753a6843aa4ab7d7326c0/INR+Note+1+-+The+Impact+of+Infrastructure+on+Growth.pdf?MOD=AJPERES</u> (accessed on 19 January 2016).

Estache, A. (2010), "Infrastructure finance in developing countries: an overview", *EIB Papers*, Vol. 15/2, European Investment Bank, Luxembourg, <u>www.researchgate.net/publication/254448619</u> Infrastructure finance in developing countries An overview.

Flyvbjerg, B., M. Skamris Holm, and S. Buhl (2005), "How (In)accurate are Demand Forecasts in Public Works Projects? The Case of Transportation", Journal of the American Planning Association, Vol. 71/2, pp. 131–146, DOI: 10.1080/01944360508976688.

Flyvbjerg, B., M. Skamris Holm, and S. Buhl (2006), "Inaccuracy in Traffic Forecasts", *Transport Reviews*, Vol. 26/1, pp. 1–24, DOI: 10.1080/01441640500124779.

Freshfields Bruckhaus Derringer (2014), "Europe: Time to Act – What's in the Infrastructure Pipeline? Outlook for Infrastructure 2014", Presentation to stakeholders from the infrastructure market, Freshfields Bruckhaus Derringer, <u>http://www.freshfields.com/uploadedFiles/SiteWide/</u> <u>News_Room/Insight/Project_Bonds/Outlook%</u> (accessed on 19 January 2016).

Gillen, D. (2007), "The Regulation of Airports", *Centre for Transportation Studies Working Paper*, No. 2007-5, Sauder School of Business, University of British Columbia, Vancouver, <u>www.sauder.ubc.ca/Faculty/Research_Centres/Centre_for_Transportation_Studies/~/media/Files/Faculty%20Research/OPLOG%20Division/OPLOG%20Publications/GILLEN/Gillen%20-%20Regulation.ashx.</u>

Gonzalez Alegre, J. et al. (2008), "Composition of government investment in Europe: Some forensic evidence", *EIB Papers*, Vol 13/1, European Investment Bank, <u>www.eib.org/en/infocentre/publications/</u><u>all/eibpapers-2008-v13-n01.htm</u>.

Hammami, M., J-F. Ruhashyankiko and Yehoue, E. (2006), "Determinants of Public-Private Partnerhsips in Infrastructure", *IMF Working Paper*, No. 06-99, International Monetary Fund, New York, <u>www.imf.org/en/Publications/WP/Issues/2016/12/31/Determinants-of-Public-Private-Partnerships-in-Infrastructure-19086</u>.

Harris, C. and K. Pratap, (2009), "What drives private sector exit from infrastructure? Economic crises and other factors in the cancellation of private infrastructure projects in developing countries", *Gridlines*, Brief no. 47884, Note no. 46, PPIAF, The World Bank, Washington, D.C.,

http://documents.worldbank.org/curated/en/867251468150306230/What-drives-private-sector-exitfrom-infrastructure-Economic-crises-and-other-factors-in-the-cancellation-of-private-infrastructureprojects-in-developing-countries.

Inderst, G. (2013), "Private Infrastructure Finance and Investment in Europe", *EIB Working Papers*, No. 2013/02, European Investment Bank, Luxembourg, <u>www.eib.org/attachments/efs/economics_working_paper_2013_02_en.pdf</u>.

Izaguirre, A. and S. Prakash Kulkarni (2011), "Identifying Main Sources of Funding for Infrastructure Projects with Private Participation in Developing Countries: A Pilot Study", *PPIAF Working Paper*, No. 9, The World Bank, Washington D.C.

ITF (2008), Transport Infrastructure Investment: Options for Efficiency, OECD/ITF Publishing, Paris, www.itf-oecd.org/sites/default/files/docs/08infrinvest.pdf.

J.P. Morgan (2011), "The Infrastructure Moment: Favourable Trends in Infrastructure Financing", J.P. Morgan Chase and Co., New York, <u>https://www.jpmorgan.com/cm/BlobServer/</u> <u>The_Infrastructure_Moment.pdf?blobkey=id&blobwhere=1158642858150&blobheader=application%2F</u> <u>pdf&blobheadername1=CacheControl&blobheadervalue1=private&blobcol=urldata&blobtable=</u> MungoBlobs (accessed on 19 March 2019).

KPMG (2015), "Public-Private Partnerships: Emerging global trends and the implications for future infrastructure development in Australia", KPMG brochure, <u>https://assets.kpmg/content/dam/kpmg/pdf/2015/06/public-private-partnerships-june-2015.pdf</u> (accessed on 04 March 2019).

Makovšek, D. (2019), "What is Private Investment in Transport Infrastructure and Why Is It Difficult?", Working Group Paper, International Transport Forum, Paris.

Makovšek, D. (forthcoming), "The Role of Private Investment in Transport Infrastructure", Working Group Paper, International Transport Forum, Paris.

Moszoro, M. et al. (2014), "Institutional and Political Determinants of Private Participation in Infrastructure", *International Transport Forum Discussion Papers*, No. 2014/15, OECD Publishing, Paris, https://doi.org/10.1787/5jrw2xzj0m7l-en.

OECD (2007), *Infrastructure to 2030 (Vol. 2): Mapping Policy for Electricity, Water and Transport*, OECD Publishing, Paris, <u>https://doi.org/10.1787/9789264031326-en</u>.

OECD (2012), *Strategic Transport Infrastructure Needs to 2030*, OECD Publishing, Paris, https://doi.org/10.1787/9789264114425-en.

OECD (2013), The Role of Banks, Equity Markets and Institutional Investors in Long-Term Financing for Growth and Development: Report for G20 Leaders, report presented at the Meeting of the G20 Finance Ministers and Central Banks Governors on 15-16 February 2013 in Moscow, <u>www.oecd.org/finance/private-pensions/G20reportLTFinancingForGrowthRussianPresidency2013.pdf</u> (accessed 12 March 2019).

OECD (2015), OECD Economic Outlook, Volume 2015, OECD Publishing, Paris.

OECD (n.d.) "Total and government investment in transport infrastructure in OECD countries", OECD National Accounts Statistics (database), OECD Publishing, Paris, <u>https://doi.org/10.1787/na-data-en</u> (accessed on 19 January 2016).

OECD/CAF/UN ECLAC (2013), Latin American Economic Outlook 2014: Logistics and Competitiveness for Development, OECD Publishing, Paris, <u>https://doi.org/10.1787/leo-2014-en</u>.

Oxera and RBconsult (2012), "Disincentivising overbidding for toll road concessions", Report prepared for the Australian Department for Transport and Infrastructure, <u>https://www.oxera.com/wp-</u>content/uploads/2018/03/Disincentivising-overbidding-for-toll-road-concessions.pdf.

Perkins, S. (2013), "Better Regulation of Public-Private Partnerships for Transport Infrastructure: Summary and Conclusions", *International Transport Forum Discussion Papers*, No. 2013/6, OECD Publishing, Paris, <u>https://doi.org/10.1787/5k46n41s7347-en</u>.

PWC (2013), "Capital Markets: The Rise of Non-Bank Infrastructure Project Finance – Talking Points", PWC paper, PricewaterhouseCoopers LLP, <u>https://www.pwc.com/gx/en/capital-projects-</u> infrastructure/publications/assets/pdfs/pwc-capital-markets-the-rise-of-non-bank-infrastructure-projectfinance.pdf (accessed on 04 March 2019).

PWC (2014), "Developing Infrastructure in Asia Pacific: Outlook, Challenges and Solutions", PWC paper, PricewaterhouseCoopers LLP, <u>https://www.pwc.com.au/industry/infrastructure/assets/developing-infrastructure-asia-pacific-sep14.pdf</u> (accessed on 04 March 2019).

PWC (2015), "Airport Transactions: Airport Privatisations Elevate Deal Activity to Higher Altitudes", PWC paper, PricewaterhouseCoopers LLP, <u>https://www.pwc.com/gx/en/capital-projects-infrastructure/pdf/pwc-airport-transactions.pdf</u> (accessed on 04 March 2019).

Rhoades, T. (ed.) (2012), "Project Finance", in *Euromoney Encyclopedia of Debt Finance*, 2nd edn., Euromoney Institutional Investor PLC, London.

Sharma, C. (2012), "Determinants of PPP in infrastructure in developing economies", *Transforming Government: People, Process and Policy*, Vol. 6/2, pp. 149-166, <u>https://doi.org/10.1108/17506161211246908</u>.

Sutherland, D. et al. (2011), "Public Policies and Investment in Network Infrastructure", *OECD Journal: Economic Studies*, Vol. 2011/1, <u>https://doi.org/10.1787/eco_studies-2011-5kg51mlvk6r6</u>.

Thomson Reuters (n.d.), Thomson Reuters One (database), <u>https://www.thomsonone.com/</u> <u>DirectoryServices/2006-04-01/Web.Public/Login.aspx?brandname=www.thomsonone.com&</u> <u>version=3.7.9.18833&protocol=0</u> (accessed on 19 January 2016).

Wagenvoort, R., C. De Nicola and A. Kappeler (2010), "Infrastructure finance in Europe: Composition, evolution and crisis impact", *EIB Papers*, Vol. 15, No. 1/2010, European Investment Bank, www.eib.org/en/infocentre/publications/all/eibpapers-2010-v15-n01.htm.

Woodman, E. (2006), "The market for financing of infrastructure projects through public-private partnerships: Canadian developments", *Financial System Review*, Bank of Canada, <u>www.bankofcanada.ca/wp-content/uploads/2012/01/fsr-0606-woodman.pdf</u> (accessed on 04 March 2019).

World Bank (2013), "Long-term investment financing for growth and development", Prepared by World Bank staff and presented to the Meeting of the G20 Ministers of Finance and Central Bank Governors,

Moscow, February 2013, <u>www.g20chn.org/English/Documents/PastPresidency/</u>201512/P020151225691284966192.pdf.

World Bank (n.d.), World Development Indicators (database), <u>https://datacatalog.worldbank.org/</u><u>dataset/world-development-indicators</u> (accessed on 19 January 2016).

WEF (2013), *Strategic Infrastructure: Steps to Prepare and Accelerate Public-Private Partnerships*, World Economic Forum, Geneva, <u>www.weforum.org/reports/strategic-infrastructure-steps-prepare-and-accelerate-public-private-partnerships</u>.

Appendix 1: PSPI and characteristics

Characteristics	Forms of PSPI									
	Service contract (outsourcing)	Management contract	Lease/ affermage	Government- funded BOT and variants	User-funded BOT, variants, existing assets (concessions)	Divestitures (privatisation)				
What PPPs encompass										
Scope (discrete piece of network)	Discrete existing assets and network	Normally discrete existing assets	Discrete existing assets (e.g. port terminal) and networks (e.g. water)	Discrete new assets or refurbishment	Existing networks and normally existing node infrastructure (e.g. ports and airports)	Existing network and node infrastructure (e.g. ports and airports)				
Contract duration	1-3 years	2-5 years	10-20 years	25-30 years	25-30 years	Perpetual/ subject to license				
Commercial/ demand risk for the private party	None	None	Yes	Both options (yes or no)	Both options (yes or no)	Both options (yes or no)				
Money at risk ex ante*	No	No	No	Yes	Both options (yes or no)	Yes				
Provider of service	Private	Private	Private	Private	Private	Private				
Tariff setting	Public	Public	Subject to contract performance parameters/ discretion of regulator	Mostly fixed, part variable related to production parameters	ariable related contract con o production performance pe					
Price regulation	No	No	Yes, in monopoly situations	monopoly situations (ince		Yes, in monopoly situations (incentive regulation)				
Private investment during contract	No	No	No	Small investments/renewals are done by the private party (major expansions/refurbishments in the regulated case are approved by the public sector/regulator and financed by the private party)						
Legal ownership of assets	Public	Public	Public	Public/private	Public/private	Private				
Competition	Ongoing	One time only; contracts usually not renewed	One time only; contracts usually not renewed	Initial contract only; subsequent contracts usually negotiated	Initial contract only; subsequent contracts usually negotiated	Initial contract only; periodic renegotiation through price reviews				

*Does the private partner have to pay for the contract upfront (e.g. by financing and building the infrastructure)? In operations where the private party must buy equipment because there is no market for leasing it, this would also qualify as ex ante money at risk.

Source: Makovšek (2019).

Appendix 2. Summary of Project-Based Data Used in the Report

Wagenvoort, De Nicola and Kappeler (2010) state that "investment levels" are assumed to be private and reflect the total project amount at financial closure converted to constant 2014 international dollars. They do so using purchasing power parities and the growth of GDP in constant local currency units from the World Bank Development Indicators database. This is complemented by the IMF's World Economic Outlook database.¹ "Project amount" refers to investments in the form of construction, expansion, and refurbishment of physical assets, as well as in the financing of acquisitions if the repayment of debt is based on cash flows of the assets and they are structured like project finance transactions. Refinancing deals were excluded and treated separately in Section III to the extent that they do not normally represent new or additional investments.

	Number of deals	Project amount in USD, constant 2014 international dollar	Project amount in USD, constant 2014 international dollar, % of 2014 GDP	% of total project amount			% of num	ber of de	als		
	Total	Total	Total	Airports	Ports	Railroads	Roads	Airports	Ports	Railroads	Roads
Project country		1995-2016									
Albania	3	244	0.82%	44%	0%	0%	56%	33%	0%	0%	67%
Andorra	1	n/a	0.00%	n/a	n/a	n/a	n/a	0%	0%	0%	100%
Angola	1	43	0.02%	0%	100%	0%	0%	0%	100%	0%	0%
Antigua and Barbuda	1	143	7.12%	100%	0%	0%	0%	100%	0%	0%	0%
Argentina	4	1,557	0.16%	0%	0%	25%	75%	0%	0%	25%	75%
Armenia	3	560	2.31%	41%	0%	0%	59%	67%	0%	0%	33%
Australia	102	70,485	6.83%	15%	25%	24%	36%	28%	21%	22%	29%
Austria	3	1,444	0.37%	0%	0%	0%	100%	0%	0%	0%	100%
Azerbaijan	1	45	0.03%	100%	0%	0%	0%	100%	0%	0%	0%
Bahamas	6	1,015	11.28%	100%	0%	0%	0%	100%	0%	0%	0%
Belgium	14	5,111	1.07%	0%	27%	20%	54%	0%	29%	29%	43%
Bolivia	1	275	0.39%	0%	0%	0%	100%	0%	0%	0%	100%
Brazil	100	48,676	1.49%	12%	24%	17%	47%	12%	21%	16%	51%
Bulgaria	4	1,027	0.86%	53%	24%	0%	23%	25%	25%	0%	50%
Cameroon	1	453	0.67%	0%	0%	0%	100%	0%	0%	0%	100%

¹ Although it would likely be more appropriate to adjust according to a specific deflator to gross fixed capital formation (e.g the cost for land and construction of civil engineering), this was not readily available for a significant number of countries covered in the data. Data was, thus, adjusted as per the general GDP deflator implied in the constant GDP growth in local currency units.

Canada	35	22,381	1.43%	9%	3%	19%	70%	9%	9%	17%	66%
Chile	34	11,265	2.84%	13%	9%	5%	72%	12%	15%	6%	68%
China (People's Republic of)	82	160,980	0.89%	6%	1%	45%	48%	5%	11%	38%	46%
Colombia	15	11,377	1.78%	20%	15%	4%	61%	20%	27%	13%	40%
Congo	1	15	0.05%	0%	100%	0%	0%	0%	100%	0%	0%
Costa Rica	4	877	1.24%	36%	0%	7%	57%	50%	0%	25%	25%
Cote D'Ivoire	5	1,093	1.51%	3%	0%	33%	64%	20%	0%	40%	40%
Croatia	11	3,849	4.28%	17%	0%	0%	83%	27%	9%	0%	64%
Cyprus*	1	899	3.41%	100%	0%	0%	0%	100%	0%	0%	0%
Czech Republic	6	2,716	0.85%	20%	0%	65%	15%	17%	0%	67%	17%
Denmark	2	1,068	0.42%	85%	0%	0%	15%	50%	0%	0%	50%
Djibouti	1	612	21.36%	0%	100%	0%	0%	0%	100%	0%	0%
Dominican Republic	4	1,313	0.95%	33%	27%	0%	40%	25%	25%	0%	50%
Ecuador	5	1,238	0.68%	29%	17%	54%	0%	20%	40%	40%	0%
Egypt	7	9,765	1.04%	29%	26%	44%	0%	43%	14%	29%	14%
El Salvador	1	55	0.11%	0%	100%	0%	0%	0%	100%	0%	0%
Estonia	4	212	0.60%	0%	60%	40%	0%	0%	75%	25%	0%
Ethiopia	1	263	0.18%	0%	0%	0%	100%	0%	0%	0%	100%
Finland	6	1,151	0.53%	0%	6%	12%	82%	0%	17%	17%	67%
France	39	36,950	1.44%	4%	2%	43%	51%	13%	3%	31%	54%
Germany	24	19,428	0.52%	24%	0%	40%	36%	13%	4%	25%	58%
Ghana	6	3,829	3.50%	0%	100%	0%	0%	0%	100%	0%	0%
Greece	14	25,849	9.12%	0%	0%	0%	100%	0%	0%	0%	100%
Honduras	2	153	0.39%	0%	0%	0%	100%	0%	0%	0%	100%
Hong Kong (China)	8	2,021	0.51%	2%	34%	43%	21%	13%	25%	25%	38%
Hungary	13	12,204	5.01%	30%	0%	15%	55%	15%	0%	15%	69%
India	335	200,688	2.72%	5%	12%	12%	72%	3%	13%	4%	79%
Indonesia	29	25,150	0.94%	0%	24%	7%	69%	0%	14%	10%	76%
Iraq	1	1,795	0.34%	0%	100%	0%	0%	0%	100%	0%	0%
Ireland	14	4,353	1.94%	0%	0%	7%	93%	0%	0%	7%	93%
Israel	6	2,940	1.08%	0%	0%	28%	72%	0%	0%	33%	67%
Italy	39	30,941	1.45%	15%	0%	12%	72%	15%	0%	28%	56%
Jamaica	6	2,152	8.91%	13%	23%	0%	64%	33%	17%	0%	50%
Japan	20	6,800	0.15%	65%	2%	11%	22%	35%	10%	20%	35%
Jordan	4	2,525	3.17%	75%	21%	3%	0%	50%	25%	25%	0%
Kazakhstan	1	103	0.02%	0%	0%	100%	0%	0%	0%	100%	0%

Kenya	3	1,045	0.79%	0%	6%	37%	58%	0%	33%	33%	33%
Korea	65	45,414	2.62%	0%	14%	33%	53%	2%	29%	20%	49%
Latvia	1	100	0.22%	0%	100%	0%	0%	0%	100%	0%	0%
Lebanon	2	169	0.21%	0%	55%	0%	45%	0%	50%	0%	50%
Lithuania	3	560	0.72%	0%	90%	0%	10%	0%	67%	0%	33%
Republic of North Macedonia	2	591	2.17%	52%	0%	0%	48%	50%	0%	0%	50%
Malaysia	16	29,007	3.78%	3%	3%	65%	29%	6%	13%	31%	50%
Malta	1	125	0.89%	100%	0%	0%	0%	100%	0%	0%	0%
Mauritius	1	8	0.03%	100%	0%	0%	0%	100%	0%	0%	0%
Mexico	46	31,864	1.49%	30%	8%	11%	51%	13%	15%	9%	63%
Moldova	1	24	0.14%	100%	0%	0%	0%	100%	0%	0%	0%
Morocco	2	864	0.33%	0%	38%	62%	0%	0%	50%	50%	0%
Mozambique	1	61	0.20%	0%	100%	0%	0%	0%	100%	0%	0%
Netherlands	24	13,705	1.71%	0%	23%	39%	38%	0%	33%	13%	54%
Netherlands Antilles	1	n/a	0.00%	n/a	n/a	n/a	n/a	100%	0%	0%	0%
New Zealand	3	1,460	0.89%	6%	0%	0%	94%	33%	0%	0%	67%
Nigeria	1	865	0.08%	0%	0%	0%	100%	0%	0%	0%	100%
Norway	3	632	0.19%	0%	0%	0%	100%	0%	0%	0%	100%
Oman	7	2,718	1.66%	21%	79%	0%	0%	29%	71%	0%	0%
Pakistan	3	3,527	0.40%	0%	18%	0%	82%	0%	67%	0%	33%
Panama	15	12,047	14.91%	17%	68%	3%	12%	27%	20%	13%	40%
Papua New Guinea	1	37	0.18%	100%	0%	0%	0%	100%	0%	0%	0%
Peru	19	12,623	3.40%	2%	15%	38%	45%	5%	26%	21%	47%
Philippines	8	7,648	1.11%	15%	1%	65%	18%	13%	13%	25%	50%
Poland	14	8,864	0.94%	12%	5%	2%	81%	21%	21%	14%	43%
Portugal	48	35,626	12.07%	0%	1%	19%	80%	0%	6%	10%	83%
Puerto Rico	2	2,431	1.88%	34%	0%	0%	66%	50%	0%	0%	50%
Qatar	3	1,890	0.62%	0%	0%	48%	52%	0%	0%	67%	33%
Romania	6	3,095	0.80%	0%	3%	38%	59%	0%	33%	33%	33%
Russian Federation	11	11,560	0.31%	35%	2%	2%	61%	36%	18%	9%	36%
Saudi Arabia	10	26,992	1.68%	35%	13%	52%	0%	50%	30%	20%	0%
Senegal	5	1,839	5.37%	15%	27%	0%	57%	20%	20%	0%	60%
Serbia	1	1,973	2.19%	0%	0%	0%	100%	0%	0%	0%	100%
Sierra Leone	1	48	0.39%	0%	0%	0%	100%	0%	0%	0%	100%
Singapore	3	4,297	0.95%	0%	52%	0%	48%	0%	33%	0%	67%
Slovak Republic	3	4,398	2.93%	0%	0%	0%	100%	0%	0%	0%	100%

Slovenia	3	257	0.42%	0%	0%	0%	100%	0%	0%	0%	100%
South Africa	11	10,310	1.46%	13%	6%	56%	25%	27%	9%	9%	55%
Spain	128	50,298	3.26%	1%	3%	37%	59%	2%	9%	24%	65%
Sri Lanka	1	518	0.22%	0%	100%	0%	0%	0%	100%	0%	0%
Sudan	1	366	0.23%	100%	0%	0%	0%	100%	0%	0%	0%
Suriname	1	63	0.71%	0%	0%	0%	100%	0%	0%	0%	100%
Sweden	1	317	0.07%	0%	0%	100%	0%	0%	0%	100%	0%
Taiwan	12	16,679	1.55%	0%	12%	86%	2%	0%	33%	58%	8%
Tanzania	1	410	0.32%	100%	0%	0%	0%	100%	0%	0%	0%
Thailand	7	4,242	0.40%	0%	3%	58%	39%	0%	14%	29%	57%
Tunisia	1	1,730	1.38%	100%	0%	0%	0%	100%	0%	0%	0%
Turkey	37	48,657	3.34%	47%	16%	8%	29%	32%	27%	22%	19%
Turkmenistan	3	349	0.42%	35%	12%	53%	0%	33%	33%	33%	0%
Ukraine	3	1,898	0.51%	6%	0%	11%	83%	33%	0%	33%	33%
United Arab Emirates	8	21,140	3.44%	57%	2%	41%	0%	38%	25%	38%	0%
United Kingdom	95	111,815	4.36%	35%	8%	46%	12%	22%	7%	31%	40%
United States	66	65,370	0.38%	8%	16%	5%	71%	8%	15%	5%	73%
Uruguay	3	316	0.44%	53%	17%	30%	0%	33%	33%	33%	0%
Uzbekistan	1	148	0.09%	100%	0%	0%	0%	100%	0%	0%	0%
Venezuela	2	1,325	0.24%	0%	0%	100%	0%	0%	0%	100%	0%
Viet Nam	9	3,229	0.63%	0%	64%	3%	33%	0%	56%	11%	33%
Yemen	2	245	0.24%	0%	0%	0%	100%	0%	0%	0%	100%
Zambia	1	n/a	0.00%	n/a	n/a	n/a	n/a	0%	0%	100%	0%
Zimbabwe	1	263	0.96%	0%	0%	100%	0%	0%	0%	100%	0%

*Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue". Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Note: Project data is available for 31 OECD countries and 80 non-OECD countries. Only projects reaching financial closure are included and the date refers to the financial close date. Refinancing deals are not included. Data do not cover infrastructure service contracts (e.g. management and lease contracts). Transactions are reported in USD million in the database (transactions not denominated in USD are converted to USD at the loan agreement signing date by Dealogic), and converted to constant 2014 international dollars using purchasing power parities and the growth of GDP in constant local currency units from the World Bank Development Indicators database, complemented by the IMF's World Economic Outlook database when not available. Transport infrastructure sectors refers to Dealogic's classification: airport; bridge, road and tunnel (roads); rail infrastructure and urban railway/LRT/MRT (railroads); and ports. Projects are assumed to be private, although they may involve public investment.

Source: Dealogic (n.d.).

Appendix 3. Research questions and outputs of the Working Group on Private Investment in Infrastructure

Introduction: Getting the basics right

What are the economic characteristics of infrastructure? What is infrastructure and what are operations? What are the models of private participation in infrastructure and through which significant private investment actually takes place?

Can private investment improve productive efficiency? Improve project selection? Close the infrastructure funding gap? Have other positive effects when it is private?

What have the private investment trends in transport infrastructure been over the last 20 years? How much of that was foreign private investment? Makovšek, D. (2019), "What is Private Investment in Transport Infrastructure and Why is it Difficult?", Working Group Paper, International Transport Forum, Paris.

Makovšek, D. (forthcoming), "The Role of Private Investment in Transport Infrastructure", Working Group Paper, International Transport Forum, Paris.

Mistura, F. (2019), "Quantifying Private and Foreign Investment in Transport Infrastructure", Working Group Paper, International Transport Forum, Paris.

Defining the challenge: How uncertainty in contracts matters

How does uncertainty affect risk pricing? Beyond investors, do suppliers in PPPs also have issues with risk pricing? How does its transfer to the private sector affect competition? What does uncertainty mean for the public vs. private cost of financing?	Makovšek, D. and Moszoro, M. (2018), "Risk pricing inefficiency in public–private partnerships", <i>Transport Reviews, 38</i> (3), 298-321.
<i>Is uncertainty also an issue in long-term services/operations contracts?</i>	Beck et al. (forthcoming), "Uncertainty in Long-term Service Contracts: Franchising Rail Transport Operations", Working Group Paper, International Transport Forum, Paris.
What is the competition for large transport infrastructure projects in the EU Market? Is there a difference between traditional procurement and PPPs?	Roumboutsos, A. (forthcoming),"Competition for Infrastructure Projects: Traditional Procurement and PPPs in Europe", Working Group Paper, International Transport Forum, Paris.

Addressing uncertainty for suppliers: the construction phase as example

Adversarial vs. collaborative procurement – is collaborative contracting the future?	Eriksson et al. (forthcoming), "Collaborative Infrastructure Procurement in Sweden and the Netherlands", Working Group Paper, International Transport Forum, Paris.
What lessons in dealing with risk and uncertainty were learnt in Danish mega projects from Storebaelt to Femernbaelt?	Vincentsen, L. and K. S. Andersson (2018), "Risk Allocation in Mega-Projects in Denmark", Working Group Paper, International Transport Forum, Paris.
What can governments do in the short run to reduce inefficient pricing of risk by construction contractors?	Kennedy et al. (2018), "Risk Pricing in Infrastructure Delivery: Making Procurement Less Costly", Working Group Paper, International Transport Forum, Paris.

Addressing uncertainty in long-term contracts in the absence of continuous pressure for efficiency

What is the public sector organisational counterfactual on which private investment should seek to improve?	Holm, K.V. and T.H. Nielsen (2018), "The Danish State Guarantee Model for Infrastructure Investment", Working Group Paper, International Transport Forum, Paris.
Partial fixes to the Private-Public Partnership approach	
How would an organisational structure consisting of PPPs come close to a network-wide management approach? What benefits would it yield?	Vasallo, J. (forthcoming), "Public-Private Partnerships in Transport: Unbundling Prices from User Charges", Working Group Paper, International Transport Forum, Paris.
Should the public or the private side bear the cost of long- term uncertainty? How could we design a PPP contract to avoid hold-up due to incomplete contracts?	Engel et al., (forthcoming), "Dealing with the Obsolescence of Transport Infrastructure in Public-Private Partnerships", Working Group Paper, International Transport Forum, Paris.
Long-term strategic approach	
<i>How do the PPP and regulated utility model (RAB) compare in terms of efficiency incentives?</i>	Makovšek, D. and D. Veryard (2016), "The Regulatory Asset Base and Project Finance Models", International Transport Forum Discussion Papers, No. 2016/01, Paris.

What basic considerations underlie the choice between a PPP and RAB approach?	Hasselgren, B. (forthcoming), "Risk allocation in Public-Private Partnerships and the Regulatory Asset Base Model", Working Group Paper, International Transport Forum, Paris.
Which are the preconditions a country would need to take to establish a RAB model on a motorway network? Is user- charging a must?	Alchin, S. (forthcoming), "A Corporatised Delivery Model for the Australian Road Network", Working Group Paper, International Transport Forum, Paris.
From the investors' point of view, does a RAB need to be fully reliant on user-charging?	Francis, R. and Elliot, D. (forthcoming), "Infrastructure Funding: Does it Matter Where the Money Comes From?", Working Group Paper, International Transport Forum, Paris.
Incentive regulation can also yield perverse incentives. Can the capex bias be managed?	Smith et al. (forthcoming), "Capex Bias and Adverse Incentives in Incentive Regulation: Issues and Solutions", Working Group Paper, International Transport Forum, Paris.
Does it make sense to pursue hybrid solutions between PPP and RAB?	Zhivov, N. (2018), "The Thames Tideway Tunnel: A Hybrid Approach to Infrastructure Delivery", Working Group Paper, International Transport Forum, Paris.

Uncertainty and private investment mobilisation in transport infrastructure

What lessons can we draw from recent attempts to mobilise private investment in infrastructure in the aftermath of the global financial crisis?	Makovšek, D. (2018), "Mobilising Private Investment in Infrastructure: Investment De-Risking and Uncertainty", Working Group Paper, International Transport Forum, Paris.
Synthesis	ITF (2018), Private Investment in Transport Infrastructure: Dealing with Uncertainty in Contracts, Research Report, International Transport Forum, Paris

Quantifying Private and Foreign Investment in Transport Infrastructure

This report quantifies private and foreign investment in transport infrastructure by sub-sectors in a large range of countries. It covers investments in airports, ports, railroads and roads – in 108 economies from 1995 to 2016. The paper is part of a series of 19 papers and a synthesis report produced by the International Transport Forum's Working Group on Private Investment in Transport Infrastructure. C Presentedore

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