



ADDRESSING DATA GAPS IN LONG-TERM INVESTMENT: AN AGENDA FOR RESEARCH

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The aim of this note is to propose a research agenda for addressing the main gaps in information for understanding the drivers and impediments of long-term investment. The note builds on the FSB, IMF, OECD and World Bank 2014 project to develop a set of key quantitative indicators for long-term investment finance, which has been further developed in cooperation with other countries and international organisations (IOs), e.g. Canada, Italy, the BIS and the OECD. The result of the analysis, in the form of a proposal for a potential research agenda, is included for discussion.

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Introduction

G20 work on long-term investment finance has highlighted the lack of readily accessible, consistent and comparable data on investments and related financing on which to base policy analysis. To address this issue, the FSB, IMF, OECD and World Bank initiated a project in 2014 to develop a set of key quantitative indicators for long-term investment finance; see FSB et al (2014). In the G20 context, the OECD is following up on these recommendations in cooperation with other countries and international organisations, e.g. Canada, Italy and the BIS; see OECD (2015). The aim of this latest research is to see what type of analysis is (or is not) possible with presently available information, thus also revealing important information gaps that impede a more complete analysis of the driving forces for investment and related finance.

In addition to such primarily macro-based analysis, micro-based research has been focusing on infrastructure investment, looking at the productivity of capital and the determinants of investment and its financing (public or private) (IMF 2014 and OECD 2015). It has become clear that more evidence is needed on how infrastructure supports economic development and wealth creation, which could identify relevant factors affecting this relationship and determinants of the magnitude of impact. Measurement and analysis at this macro level could support broad public policy decisions regarding investment in infrastructure. At the same time, information on viability issues of individual projects at the micro level, or more precisely the characteristics of infrastructure investment, is needed, which could support the decision-making of private sector investors and the possible calibration of prudential frameworks.

This note seeks to identify a research agenda for addressing the main gaps in information for understanding the drivers and impediments of long-term investment and related financing. The note first outlines this possible agenda and then continues with an analysis of the potential and (present) constraints of currently available macro-economic statistics, while also exploring possible more micro-oriented lines of work. The note ends with an overview of the availability of information at the micro-level and data gaps. Based on feedback from the G20 and through further consultation with other international organisations and discussion within relevant groupings and bodies, this research agenda could be further elaborated and refined.

A Potential Agenda for Research for the G20

Policy and industry initiatives have been launched to try to get a better understanding of infrastructure at the macro and micro level (see also appendix). Taken together, all of these data sources and methods may be applied to help close the data gap in infrastructure, charting a course forward that better describes investment expectations for both policymakers and investors. The G20 could play a key role in helping to advance the proposed agenda for research, building on countries and IO's contributions and including the possible involvement of dedicated fora such as the new Global Infrastructure Hub.

It is proposed that, in the immediate future, work on data gaps at a macro, meso and micro level by international organisations and other relevant parties include the following items:

- 1) **OECD reports** on the results of their surveys on (i) transport-related infrastructure, (ii) from-whom-to-whom financial accounts (possibly with the IMF), and (iii) large pension funds.
- 2) **Country-level statistical policy notes**, similar to those already produced by Canada and Italy: Inviting other countries to draft a statistical policy note (involving national statistical authorities, other authorities in the field of policy, or experts affiliated with academia or private institutions).
- 3) Development of a proposal for a **preferred set of information on investment and finance at the macro- and meso- level**, possibly with a focus on infrastructure, with the involvement of relevant international organisations and national statistical authorities.
- 4) Development of a proposal for a **preferred set of information for the analysis of infrastructure investment at the micro level**, based on existing policy and industry initiatives and the OECD project “Infrastructure as an Asset Class”. This template could potentially be supported within the G20 context.

Monitoring and Analysing Long-Term Investment

A logical starting point for monitoring and analysing long-term investment is to start looking at the main trends in investments at a macro- and meso-level. What are the developments in the investments of the various categories of investments, such as buildings and dwellings, infrastructure, machinery and equipment? Which are the main sectors and industries investing? Etc. Such macro-level analysis would typically try to capture the overall impact of long-term investments on the future income generating capacity of country. It would also target at an assessment of the main drivers, such as future income prospects, and impediments, such as access to and affordability of long-term finance, of the various types of investment. Especially in the case of public infrastructure, it would also need to take into account the sustainability of public budgets and funding needs at all levels of government to better gauge the long-term costs of strategic infrastructure development plans; more transparency on costs and benefits of including the private sector in the provision of infrastructure should be part of this analysis. Examples of such analysis have been provided in the policy notes produced by Canada and Italy; see OECD (2015).

Typical research questions at the macro- and meso-level would include the following:

- In the case of dwellings, what are the development in house prices, for both new and existing dwellings? What are the main developments in access to and affordability of finance for households?
- In the case of buildings, machinery and equipment, how does profitability of enterprises evolve, and what are the financing possibilities, both internal from retained earnings, and external from borrowing through bank loans and through issuing debt securities and equity on the capital markets?
- In the case of infrastructure type of investments, how much (in monetary terms) is there in the first place and how have infrastructure stocks evolved over time (i.e. do annual investment flows cover depreciation)? How close to the optimum (growth-maximizing level) is the current stock, i.e. should more or less be invested, and is there an investment gap? How important is private funding of infrastructure today from a macroeconomic perspective? What is the relative importance of public sources? What are recent trends? Also questions on what determines investment, e.g. does fiscal decentralization boost local and regional government infrastructure investment may need to be addressed.

A rather specific type of investment concerns investment in infrastructure, however defined not only because of its unique characteristics involving substantial financial amounts of finance for individual projects, but also because of its more generic benefits for the economy at large and its potential to increase future growth prospects of an economy. When it comes to the drivers and impediments of investments in infrastructure, some of the questions may be answered by analysis at the macro-level or looking at the performance of certain sectors/industries. For example, water and electricity distribution sectors can be analysed with a broad set of indicators (changes in output, labour, efficiency, labour productivity, quality, coverage, and prices) that describe the current situation as well its evolution (pre/post privatisation). This will allow a better understanding of the relationship between sector performance and factors such as regulation, private sector participation, and corporate governance. Based on this analysis benchmarks, i.e. institutional designs of regulatory agencies, can be created; see e.g. WB 2014.

However, because of the unique characteristics of many infrastructure projects, one has to drill down to the individual level to arrive at an improved understanding of the drivers and impediments of the relevant investments. The main objective of such micro-based analysis is to provide a factual description of changes and policies that can be empirically tested and analysed “internally” by people with decision-making authority over sector policy, regulation, governance, and investment. In addition, private investors approaching infrastructure are also facing an “information gap”. There seems to be a disconnect between the investment narrative – a series of intuitions drawn from economics – and the observed performance of available investment products, due to a lack of clarity of relevant assets related to the relative novelty of the asset class and a lack of empirical evidence on the investment characteristics. Besides financiers, operators as well as governments and regulators have a genuine interest in the investment characteristics of the assets that they manage, privatise, or regulate. Since resource-constrained governments are unlikely to provide sufficient finance for the massive infrastructure requirements, they need to institute policies conducive to infrastructure investment, such as regulatory independence and risk mitigation mechanisms.

Micro-level analysis at individual project level may also be relevant to evaluate the specific impacts of individual infrastructure projects ex-ante in terms of resource allocation efficiency, and identify the socio-economic return of a project. Micro-level data may also provide useful information for ex post analysis, for example, for the evaluation of expenditures on infrastructure. In addition, information on the financial terms of the projects could provide more evidence for public authorities about the relationship between project-specific risk and the cost of capital in completed transactions. This information would help procuring authorities to evaluate financing terms in past and future procurements, reduce their reliance on unverified third-party sources and advisers and could help to identify potential refinancing opportunities.

Typical research questions at the micro-level would include the following:

- What are the main performance trends in the region, and how heterogeneous are they? How does the performance of state-owned and private utilities differ? How does the institutional design of regulatory agencies affect sector performance? What management mechanisms create incentives for improved performance?
- What is the depth and breadth of the infrastructure market? What are the instruments (debt/equity) and vehicles (corporate/banks/funds) available in infrastructure finance? How should investment be defined knowing that there are many instruments?
- What is the investment risk profile of infrastructure and its (sub) sectors? How does the corporate, systematic, and idiosyncratic risk exposure of infrastructure compare to market-average equity investments (i.e. correlation of infrastructure to financial markets)? Is long-term infrastructure a low-risk (low beta) investment? Are there excess returns (alpha) available in infrastructure?

- How does public sector intervention through mitigation techniques and incentives factor into this assessment? What is the impact of infrastructure regulation on systematic risk? How do price regulation, the regulatory regime, and regulatory independence affect risk?
- What is the potential role of infrastructure to match the long term liabilities of pension funds and life insurers in a liability driven investment context? What are the inflation hedging properties of infrastructure? Does infrastructure provide enhanced inflation protection relative to market-average equities? What about deflation protection?
- What is the importance of Environment, Social and Governance factors on asset allocation and what are the “green” investment determinants (i.e. clean energy)?
- How to estimate the cost of private capital in the Value for Money assessment model? How to ensure the private sector is not gaining excess returns?
- How to price market interventions which involve public authorities assuming project risks (i.e. the UK Guarantees scheme for infrastructure investment, EC project bond initiative) to adequately reflect the risk to the taxpayers?

Availability of Data and Information Gaps at the Macro- and Meso-Level

Looking at the availability of data at the macro- and meso-level, most countries have available macro-economic data on investments, including for most G20-countries a broad breakdown by sector of investor and by asset category (residential dwellings, other buildings and structures, transport equipment, etc.). This information does not only concern quarterly and/or annual expenditures, it usually also includes estimates of end-of-year capital stocks and depreciation. A cross-classification of types of investment and industries (agriculture, manufacturing, transport, education, etc.) is often available. However, a cross-classification with institutional sectors (government, non-financial corporations, financial corporations and households) is generally more problematic. If the latter data at current prices already may pose a problem, this holds even more for data at constant prices, which are needed to derive volume developments (adjusted for price changes). It is important though to have data by institutional sector, as this enables to establish a link between investments and finance, as data on financing are typically only available for institutional sectors. The breakdown would also enable to analyse and monitor shifts in types of investors, for example infrastructure investments moving from the public to the private sector. One would also prefer to have more detailed information on investments by Public-Private Partnerships (PPPs), which may be recorded in the government sector or in the private sectors, depending on who receives the risks and rewards from the relevant investments.

Furthermore, it shows that the present classification by type of assets is not fully aligned to the type of questions raised in the context of long-term investment finance. One especially would like to have a further breakdown of “other buildings and structures”, a category which includes a variety of assets such as factories, office buildings, transport infrastructure (roads, railways, airports, harbours, waterways), sewerage systems, communication and power lines, water defence works, etc. At the request of the International Transport Forum, the OECD conducted a survey across countries, requesting them to provide additional details on transport-related investments and capital stocks that are nationally available. Data was received from 29 countries. Relatively few countries were able to provide additional details pertaining specifically to transport infrastructure. For “other structures”, eight countries provided data that were categorised by at least one type of transport structure (Canada, Chile, Czech Republic, Korea, Lithuania, Norway, Sweden, and the U.S.). Roads and railways were the two most commonly provided categories. Only Norway and the U.S. submitted data in separate categories attributable to all three major modes of transport (air, land and sea). In addition, another five countries managed to distinguish buildings from

other structures (Finland, France, Greece, Japan and Latvia), an important distinction as most buildings are usually not considered part of infrastructure investments, whether or not transport-related. More detailed results of the survey, including an analysis of the main trends in the various investment categories will become available soon.

The above approach could be usefully supplemented by looking at physical measures of infrastructure, such as kilometers of roads and, in the case of energy-related infrastructure, kilowatts of power generation capacity. One problem with physical measures is that there is no simple way to aggregate the various measures of infrastructure. A further obvious shortcoming of physical measures is that they fail to capture the quality of the infrastructure, which may vary systematically across countries. In some cases the efficiency of the use of existing infrastructure varies substantially across countries. A straight comparison between countries may thus be quite misleading without additional information.

Looking at the availability of data on finance, a significant number of G20-countries have available data on transactions and positions in the full range of financial instruments, as part of their financial accounts and balance sheets, often on a quarterly basis. This information is however somewhat scarcer for the BRIICS-countries. On the other hand, it can be noted that one of the most important recommendations of the G20 Data Gaps Initiative concerns recommendation 15 on the compilation of institutional sector accounts, with a special focus on balance sheet data; see the progress reports on the following website: http://www.principalglobalindicators.org/pages/about_iag.aspx. It can thus be expected that in the medium-term future the information base on finance will improve significantly.

An important element that could potentially enrich the data analysis at the macro-economic level relates to having financing data by counterparty sector. Such data would describe, for each type of financial instrument, the changes in the (sub)sectors providing finance to investing sectors such as government, non-financial corporations and households. One could thus analyse whether, for example, the rest of the world or the shadow banking industry, as opposed to traditional lending by resident commercial banks, has become more/less important in financing domestic investments. Although the compilation of this kind of data is heavily promoted in the G20 Data Gaps Initiative, to arrive at an improved information base of the interconnectedness of sectors and an enhanced analysis of related risks, relatively few countries seem to have available a full-fledged system of these so-called “from-whom-to-whom” tables. In this respect, it can be noted that the OECD, as part of a survey on the changeover to the new international standards for national accounts, the System of National Accounts (SNA) 2008, will gather information on the actual availability of such information on a “from-whom-to-whom” basis. Results of this survey will become available in the course of September/October this year.

One of the problems faced with in analysing investment and finance concerns the fungible nature of finance. There is no direct link between liabilities, be it loans, securities or equity, and investments. This is especially true for government, which often finance the shortage of current income to cover current expenditures by increasing debt levels. But it is also true for non-financial corporations and households which may also finance (part of) their investments out of past savings or retained earnings, or short-term funding instruments. This problem can be addressed, at least partly, by complementing the macro-economic analysis with survey and firm-level data. Examples in the European context may include the Bank Lending Survey (BLS) and the Survey on the Access to Finance of Enterprises (SAFE) conducted by the European Central Bank (ECB) and the Investment Survey by the European Commission. Breakdowns of non-financial corporations into different size classes may reveal differences in access to financial markets for large, medium and small enterprises. A further piece of information could possibly be found in having an inventory of measures and policies that potentially may have an impact on the investment and financing behaviour of economic actors, such as measures increasing the capital requirements of financial corporations, or changes in (tax) regimes related to mortgage loans for households.

Another piece of information that could enrich the macro-economic analysis relates to the issue that lagging domestic investments in some developed countries may be related to domestically based multinational enterprises shifting real investments in domestic industries to (financial) investments in the rest of the world, thus shifting production outside the resident economy, without there being an equivalent reverse move of foreign based multinationals investing in the domestic economy. The analysis of investments and finance could thus gain from including an extended and more detailed analysis of foreign direct investment flows. The latter data are indeed available for quite a number of economies, although more scarcely available information on the activities of non-resident subsidiaries of domestically based multinational enterprises would be needed as well.

The macro-economic data on investments and finance, according to the framework proposed by the FSB and other international organisations (2014), do not answer the question whether developments are supply-driven or demand-driven, whether there is a general lack of willingness to invest or lack of viable projects, or whether there are certain impediments in getting the necessary financial resources, e.g. as a consequence of a credit crunch in bank lending, resulting from new legal requirements and/or a need for deleveraging more generally. Here, the work on the “safeguards/facilitators” G20 template for investment strategies could be very useful in complementing the macro-economic analysis.

All in all, it may be concluded that useful insights can be gained from the analysis of available macro-economic data. To some extent, the data used in the statistical policy notes drafted by Canada and Italy (see OECD, 2015) are available for quite a number of G20 economies, or they will become available in the medium-term future. Obviously, one would like to enrich the analysis with more details, for example on the various investment categories, including the sectors doing the investment, the counterparty sectors providing the finance, the linkages between domestic and foreign investments, and linking the macro-economic developments to information at the firm-level. To fully understand the underlying causes of the actual developments, the analysis would need to be supplemented by qualitative information on constraints and/or impediments affecting demand and/or supply of finance.

Availability of Data and Information Gaps at the Micro-Level

Using private sector data (firm or project data) in the infrastructure sector faces several challenges such as the lack of a commonly applied definition for infrastructure (i.e. by sector, stage of development or geographic region); the different routes to invest in infrastructure (i.e. infrastructure funds, listed companies, corporates etc.), issues with confidentiality and privacy of necessary data. Challenges are due to the fact that projects are often very different from one another and dependent on the regulatory framework or concession agreement, and more broadly on the type of contract used. For example, differences in geographical size, legal framework, and the dispersion of population are important factors affecting investment in infrastructure.

Corporate/project data

Sources of data on individual projects can come from publicly listed infrastructure corporations and public utilities or private sources such as portfolios of commercial bank loans for construction projects, development banks and project finance, investment managers, or even institutional investors themselves. Dividends to equity holders can be used for valuation purposes; however, asset-level cash flows can also be used, provided that the capital structure is known. From debt markets, credit spreads on publicly listed bonds can be modelled, but their usefulness to value assets is quite limited. Data gathering, as highlighted in the chart below, focuses on equity-level cash flows, equity returns, and on information gathered on project finance loans and bonds where such information can lead to the valuation of project assets.

Figure 1. Sources of data: pros and cons

Data Source	Pros:	Cons:
Listed Equities	<ul style="list-style-type: none"> •Easily obtained from public sources •Longer history •Broad geographical coverage •May be useful to combine with private markets data to increase robustness of results 	<ul style="list-style-type: none"> •Heavy weights in communications, which may not necessary meet definitions of infrastructure •Heavy weight in utilities and energy •Variance may be more linked to equity market performance •Disconnect with the expected performance of unlisted infrastructure equity
Investment Funds (private market, closed-ended)	<ul style="list-style-type: none"> •A source of unlisted infrastructure equity data •Representative of the "investor experience" for many institutions that use closed-ended funds •Quality is high (financials are audited) •Would capture the expected characteristics of unlisted infrastructure equity 	<ul style="list-style-type: none"> •Relies on manager supplied data, provided on a voluntary basis •Introduces potential valuation biases (manager reported NAVs) •Mismatch of fund holding period with longer-life of operational assets •privacy and confidentiality
Institutional Investors (direct equity or project finance)	<ul style="list-style-type: none"> •A source of unlisted infrastructure equity data •Would capture the expected characteristics of unlisted infrastructure equity •Cash flow histories allow for flexibilities in choosing valuation models 	<ul style="list-style-type: none"> •Relies on investor supplied data, provided on a voluntary basis •privacy and confidentiality •Scarcity
Project Finance (equity or loan investments furnished by banks or development banks)	<ul style="list-style-type: none"> •A source of unlisted infrastructure equity data •Would capture the expected characteristics of unlisted infrastructure equity •Cash flow histories allow for flexibilities in choosing valuation models 	<ul style="list-style-type: none"> •Relies on bank supplied data, provided on a voluntary basis •privacy and confidentiality •Scarcity

Listed equities

Infrastructure indices have been created to proxy the performance of listed infrastructure assets. Major indices for listed infrastructure reported market capitalizations in excess of USD 1 trillion, but consist mostly of utilities (for example UBS World Infrastructure Index > USD 200 billion market cap, while UBS Utilities Index USD 1.2 trillion market cap). The main problem is that most indices include firms that have an infrastructure theme based on sectors but are not exclusively focused on physical infrastructure assets.

Classification of infrastructure firms by sector does not necessarily explain the performance of underlying infrastructure investments, not providing a sufficiently precise definition. In fact, each of these sectors comprises a variety of economic activities along its respective vertical value chain. For example, the ports sector may include operators of port facilities such as piers and terminals as well as providers of ancillary port services such as tugging, fuelling, and ship maintenance.

In the recent in depth analysis conducted by EIOPA for the re-calibration of Solvency II, the infrastructure definition covered investments in infrastructure project debt and equity (both directly and via funds). Debt and equity of corporates in the infrastructure sector were excluded as a clear delineation was not feasible to prevent non-infrastructure activities benefitting from a potentially more favourable treatment in the Solvency II regime.¹

A few studies (Rothballer and Kaserer, 2012; Blanc-Brude et al., 2015 forthcoming) try to directly select stocks corresponding to infrastructure sectors that derive most of their income from infrastructure. Results seem to indicate that the mean variance frontier of efficient portfolios available to investors

¹ See recent follow up work conducted by EIOPA and the recent Call for advice from the European Commission on the identification and calibration of infrastructure investment categories, July 2 2015.

allocating to asset classes (stocks, bonds, commodities etc.) or to factors (value, growth etc.) is not improved by the addition of listed infrastructure.

Unlisted data

Most of the necessary information is private and scattered amongst numerous firms. Data collection, when it exists, is ad hoc and relies on existing practices instead of promoting data collection according to the requirements of proper asset pricing and risk measurement methods. Some specialist publications and data providers have details of various transaction terms, yet many transactions are subject to non-disclosure agreements.

The amount of available data is limited in scope, since not all types of infrastructure projects exist in large numbers, and in time, because infrastructure investments may have multi-decade lives and available records are unlikely to span such periods. When transactions reach financial close, procuring authorities receive the final transaction documents containing the commercial terms for each deal. However few governments collect data at a central level in a systematic way and procuring authorities are under no legal obligation to provide this information. For example a recent report of the National Audit Office in the UK found that despite the long experience with PPPs and PFIs, government departments are lacking comprehensive data on the costs of debt and equity of their deals².

While private equity managers could be more transparent and aim to provide performance measures that are more relevant to long-term investors, taken individually, none of them has access to enough information to answer the private equity asset allocation question. Without the constant feedback of market prices, long-term investment increases information asymmetry between investors and their managers, as well as investors' corollary demand for monitoring and reporting. On the other hand, although overall investment is still limited, some investors have built over the last decades a significant allocation to the sector and have been monitoring their investments for some time. The OECD's recent LPF and PPRF survey included 71 funds from around the world, of which 28 reported exposure to unlisted infrastructure equity; of this subset, 14 had dedicated target allocations³.

Performance and credit profile of infrastructure debts (through the experience of banks and rating agencies) can shed light on infrastructure as an asset class by helping to describe ex-post project risk, and to relate this risk to corporate risk – which is already well understood by most investors.

² In the UK for example until 2011 information on all PPP deals (including PFI) was collected by Partnerships UK (PUK). This data is incomplete – only 31% of entries in the database provided information on debt and equity returns and no information on the financial terms of the 58 deals of 2010 and 2011 was requested. Since 2012 HM Treasury has requested summary financial close data from each procuring authority for centrally supported PFI projects and it has data for 86% (25 of 29 projects) that reached financial close since 2012.

³ Six funds indicated that they planned to increase target allocations in the next few years while seven additional funds planned to establish a dedicated target allocation. The ten largest pension funds that submitted data increased alternatives from 17.6% to 19.5% of the total portfolio, on average, from 2010 to 2013. Public pension reserve funds also increased alternatives from 10.5% to 14.7% on average - an increase of 4.2 percentage points, over the same time period (OECD 2014).

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APPENDIX: DATA COLLECTION INITIATIVES

Different institutions are taking different approaches to infrastructure valuation and analysis. Differences lie in the sources of data themselves, in perspective, or in the level of granularity. For instance, looking at country-level data is helpful to understand capital flows and market-level regulatory effects on investment. Project level and corporate data is needed for understanding the risk/return characteristics of infrastructure assets. Additional granularity on main risk factors is gained through data on operational metrics of individual projects such as construction-level characteristics, traffic forecasts etc.

Figure 2. Existing work

Institution(s)	Existing Work
<p>FSB (incubator), IMF, OECD and World Bank</p> <p>Development of quantitative indicators of long-term investment finance</p>	<p>The project aims to develop a set of key quantitative indicators that can be used to monitor the main developments in the provision of long-term finance. Current indicators being targeted include country level data on types of long-term investment by investor type and sources of long-term finance.</p> <p>The initial phase of the project will draw on existing data. While the FSB has been the initial incubator of this work there is a question as to how it is carried forward.</p>
<p>World Bank</p> <p>Private Participation in Infrastructure (PPI) Project Database</p>	<p>The PPI database includes data of private participation in over 5,000 projects in 139 low- and middle-income countries, covering the energy, telecommunications, transport, and water and sewerage sectors. Data covered includes contractual arrangements used to attract private investment, the sources and destination of investment flows, and information on the main investors.</p> <p>The World Bank sees potential to work with the GIC to expand the database to cover public infrastructure investment and OECD countries.</p>
<p>EDHEC-Risk Institute</p> <p>Benchmarking Long-Term Investment in Infrastructure</p>	<p>The EDHEC-Risk Institute has highlighted the need to address the scarcity of historical data on the past performance of infrastructure debt and equity instruments and of project cash flows.</p> <p>They are starting to progress work on data collection and have drafted a road map with proposed steps and data collection requirements to create benchmarks of long-term infrastructure and how this could be implemented. This aims to help investors to determine expected behaviour of long-term infrastructure investment (i.e. unlisted and illiquid assets) and help regulators develop appropriate risk-weights associated with this sort of investment.</p>
<p>OECD</p> <p>Project on institutional investors and long term investment</p>	<p>Based on long standing work, the OECD launched in 2012, this project which aims to facilitate long-term investment by institutional investors such as pension funds, insurance companies, and sovereign wealth funds, addressing both potential regulatory obstacles and market failures.</p> <p>Given the lack of official data at the national level the OECD has launched a survey of investments by selected pension funds across the world that are among the largest in their respective country: the OECD Large Pension Fund Survey. A similar survey has also been developed for insurance companies. These surveys are part of this project and aim to provide data on the role that large institutional investors can play in providing a source of long term capital. This project has also been recently integrated in a larger approach including all other major financing channels (corporate, banking, FDI etc.) and multiple related angles (finance, competition, investment, corporate governance, anti-corruption).</p>

Source: Discussion note circulated to the G20 Investment and Infrastructure Working Group by the Australian Ministry of Finance November 2014

Figure 3. Major industry-led initiatives

Institute	Methodology	Data	Objective
EDHEC Risk Institute	Quantitative and econometric models based on cash flows of infrastructure projects.	Project finance data combined with publicly available sources.	Calculate the risk/return characteristics and correlation of cash flows of infrastructure using project finance. Papers to be published on the valuation of debt and equity.
IPD (Index Provider)	A basic ex-post analysis of income (yield) and capital appreciation/depreciation based on reported appraisal values. Index returns will be published monthly.	Data is sourced from private-equity style infrastructure investment funds, including fund histories. Valuation will rely on manager-supplied appraisals.	To create a benchmark and a stream of historical returns of infrastructure investments for the purpose of asset allocation modelling, performance measurement, and describing characteristics of infrastructure investments.
Moody's	Credit based approach to analyse risk of infrastructure project loans and bonds.	Historical performance of project debts, mostly from bank portfolios. Debts range from 1982-2013, and cover 5,308 transactions from many geographies. Includes US municipal bonds. Robust data set.	Assign credit ratings to infrastructure project debts consistent with Moody's ratings process. A secondary outcome is to value project debts and equity. So far, this has been the most tangible output of any study (based on data) on infrastructure risk and return analysis on private investments, yet nothing has been published to further the study beyond the ratings outcome (no published data on equity investments).
MSCI (Index Provider and Risk Analytics)	Factor-based analysis of infrastructure debt and equity. Using MSCI's Barra models, common factors such as real interest rates, inflation, growth, etc. are applied to infrastructure assets to describe risk and return using known variables.	N/A	To describe the risk/return of infrastructure, using contribution to risk of the various factors. The method has the benefit of relating risks inherent in infrastructure to other existing asset classes. The creation of an index may be the result, but that is not yet clear.