

**Strong, Sustainable and Balanced Growth:
Enhancing the Impact of Infrastructure Investment on Growth and Employment**

Background note for the G20 prepared by Staff of the World Bank Group

Infrastructure is a key element of the enabling environment for economic growth. Access to infrastructure such as energy, transport, and telecommunications greatly influences the productivity of private investment and an economy's competitiveness. Infrastructure is an important facilitator of structural change. Infrastructure needs in emerging economies are large. In advanced economies as well, infrastructure modernization needs to be part of a strategy for longer-term growth. Infrastructure investment needs to be managed well to realize its potential contributions to growth.

The empirical literature confirms the long-term growth impacts of well-managed infrastructure investment. While investments in economies with slack labor markets tend to spur short-term job creation, long-term growth is driven by the productivity and competitiveness gains derived from increases in the stock and quality of infrastructure. Infrastructure can affect growth through many channels. Investments in road networks, electricity access, telecommunications, and trade infrastructure (such as ports, highway corridors and railroads) reduce the cost of delivered goods, facilitate the physical mobility of people and products, and remove productivity constraints. Infrastructure also matters for education and health outcomes. Infrastructure investment that boosts growth can pay for itself in the long term.

Infrastructure services are often provided through networks, a fact that implies a nonlinear relation with output. Telecommunications and electricity transmission exhibit strong network effects, whereby returns to users increase with the number of users. Roads, rail, and water/sanitation are also networked services, so the impact of new investments on growth, output, or firm costs will depend on the overall state and extent of the network. In general, the lower the levels of infrastructure stock and the quality of infrastructure, the larger the dividends produced by increased investment. Returns to infrastructure investment can thus be particularly high in emerging economies where the level and sophistication of infrastructure stock are typically lower than in advanced economies. Not surprisingly, given heterogeneous economic structures, levels of development, and choice and quality of individual infrastructure projects, country-level analysis of the infrastructure investment elasticities with respect to growth reveals that countries respond differently to increased investment. Even within a region of similar countries such as Central America, where growth elasticities of investment are positive across all countries, the elasticities at the country level vary considerably—from 0.01 to 0.21. Some countries can generate large growth multipliers from their investments while others hardly see a return.

Similarly, when it comes to the impact on jobs, not all infrastructure investments are equal. Empirical evidence suggests that energy generation and transport corridor investments are central to long-term competitiveness, productivity and economic growth, but they generate relatively few short-term jobs. The short-term impact on jobs will depend, among other things, on the sub-sector of infrastructure, the particular technology being deployed, the leakage levels (share of equipment and material imported), the share of required skilled versus unskilled workers, and the real wage levels for both categories of workers. Infrastructure investment packages that combine sectors can generate, on average, between 4,000 and 50,000 annualized direct and indirect short-term jobs (depending on sectors and wages) for each billion dollar spent. An investment of \$100 million in a coal-fired power plant generates under 100 direct and indirect short-term jobs for countries importing the necessary technology while an investment of the same amount in the network expansion of water supply generates about 10,000 direct and indirect short-term jobs.

While many countries already face large gaps in the stock and quality of infrastructure, the demand for infrastructure investment is rising. The increasing role of global value chains in trade,

rapid urbanization, and the challenge of climate change are all adding to the need for increased investment in infrastructure capacity, modernization, and adaptation. Transitioning to a climate resilient economy will require substantial new investment in “climate-smart” infrastructure.

Increasing Investment in Infrastructure is Not Enough

At the onset of the global financial crisis, both advanced and emerging economy governments increased budgetary commitments to infrastructure to bolster short-term economic growth and job generation. While slowly emerging from the effects of the crisis, and despite the significant expenditure on infrastructure, the U.S. and Europe are still suffering from anemic growth and stubbornly high unemployment; and growth in emerging economies has been slowing. In East and South Asia, governments continue to forge ahead with large-scale investment programs in the hopes that investment will reverse declining growth rates. In this environment, and given shrinking fiscal space, it is important that the growth and employment potential and limitations of different kinds of infrastructure investment are better understood. Ministries of finance, economy and planning, working in conjunction with line agencies and local governments, need to prioritize investments and related spending and more strategically allocate scarce resources if they are to achieve the desired short and longer-term growth and employment objectives.

Increased infrastructure investment cannot be relied upon in isolation to foster strong or sustained growth. Simply raising infrastructure investment levels by some target amount, or boosting infrastructure investment as a share of GDP, without attention to the underlying fundamentals of efficient allocation and utilization of resources is unlikely to produce the hoped-for impact on growth and job creation. Good planning and prioritization of investments and sound project selection and implementation can significantly enhance the magnitude and durability of the growth and job benefits and raise the return on scarce resources. Identification of infrastructure interventions with higher long-term socio-economic benefits can have a significant impact even at relatively modest levels of spending. Better investment planning can also help avoid locking infrastructure into inefficient and less “green” technologies.

Boosting infrastructure investment can support stronger and sustainable growth if assets are operated and maintained well. Just investing is not good enough; countries must operate and maintain their infrastructure efficiently in order to reap the full benefits from investment. Better demand management policies through improved pricing can both enhance efficiency of use of existing assets and bolster utilities’ financial capacity for effective operation and maintenance. Poor maintenance has two consequences. First, it reduces the life-span of the existing stock of infrastructure. The present value cost of rehabilitating infrastructure can be up to an order of magnitude greater than the cost of regular maintenance of those same assets. Second, it implies higher operating costs and diminished returns on private capital using the poorly performing infrastructure services. In the long term, the potential exists for a *negative* impact of infrastructure investment on growth if assets are not operated and maintained well and resources are not allocated efficiently.

Practical Considerations in Fostering Infrastructure Investment

Meeting the demand for increased investment must contend with institutional constraints. Capacity to prepare and implement projects may be inadequate in many countries. Project preparation costs for technical, financial, economic, and environmental feasibility studies can be high. Project identification and preparation is often too fragmented to provide the kind of critical mass necessary to deliver well the demanded volume of investment. Strengthening project preparation and building the institutional capacity to develop a robust project pipeline can both underpin a stronger public investment program and help attract more private financing.

Constrained public budgets make it imperative that the public sector attracts private capital into infrastructure investment. Governments around the world are increasingly turning to public-private partnerships (PPPs) to finance infrastructure investments. However, various financial and non-financial constraints act as barriers to attracting private investors.

Attracting long-term investors to commit financing for infrastructure requires addressing a variety of non-financial constraints, including in the areas of pricing, regulation, and governance. The absence of credible PPP frameworks, regulatory failings, and lack of competition are important concerns. Government practices as demonstrated by past handling of contract disputes, expropriation, and rules governing repatriation of capital affect the private sector's willingness to invest. Infrastructure investment levels are highly correlated with sovereign risk—much more so than foreign direct investment overall.

In addressing financial constraints, it is important to match the supply of and demand for infrastructure financing. On the supply side, the long-term nature of infrastructure investments and the perceived risks (including political, financial, currency, construction and operation risks) can reduce the attractiveness of investment in infrastructure sectors. Moreover, traditional providers of financing for infrastructure projects (e.g., commercial banks, particularly in Europe) are currently facing credit constraints, and the implementation of new regulations has shortened their investment horizon. During the global financial crisis, many institutional investors experienced difficulty refinancing liabilities, which led them to reassess making long-term illiquid investments. On the demand side, lack of reliable and affordable access to international capital markets for long-term financing can be a major hurdle. This can be alleviated somewhat by expanding the use of guarantees, risk insurance, and innovative finance to crowd in institutional investors and improve and develop domestic capital markets. Institutional investors may need new market instruments and regulatory reform in order to invest in infrastructure, particularly in emerging economies. Credit enhancements can help to release more risk-averse long-term capital. On-lending facilities (including at the subnational level) may also be needed. Governments need to assure that incentives, pricing, and regulations are aligned to attract financing.

Rethinking how countries invest in and use infrastructure has enormous potential to foster strong, sustainable and balanced growth.

More attention needs to be given to the quality of infrastructure investment rather than simply increasing the amount invested. Challenges differ from country to country. Country-specific actions to support growth and job creation through infrastructure investment are expected to be identified and discussed by the G20 Investment and Infrastructure Working Group.

Key measures to foster sound infrastructure investments include:

- Strengthening capacity for infrastructure planning, prioritization, and project selection;
- Improving asset management including more efficient operation and maintenance;
- Building the institutional capacity, governance, pricing structures, and credible regulatory environment to develop a strong project pipeline to attract the private sector;
- Expanding the use of guarantees, risk insurance, and innovative finance to crowd in institutional investors and improve and develop local capital markets; and
- Designing tailored plans, policies and financing tools to encourage investment in “climate-smart” infrastructure.

Tackling this interconnected agenda will require a holistic approach to infrastructure investment and financing.