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Research Report

The crucial role of infrastructure in attracting FDI

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Columbia FDI Perspectives

Perspectives on topical foreign direct investment issues

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The crucial role of infrastructure in attracting FDI

by

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It is widely believed that a country's infrastructure is a critical factor in sustaining economic growth, promoting trade and attracting foreign direct investment (FDI).¹ However, better data are required to assess the links between infrastructure, FDI and economic development. The available measures are either restricted to specific aspects of economic infrastructure, or they cover only a limited number of countries over a short period of time.

Accordingly, we constructed a global index on infrastructure.² It is based on an annual data set of 30 indicators measuring the quantity and quality of infrastructure for up to 193 countries from 1990 to 2010. In addition to the overall index, we built sub-indices for specific components: transport, information and communications technology (ICT), energy, and finance.³ With this approach, we were able to create a consistent picture of the availability and quality of infrastructure across the world.

Figure 1 maps our overall index on infrastructure, taking the year 2010 as an example.⁴ Not surprisingly, most top performers are located in the North and belong to the high-income group of countries. Low income and lower-middle income countries clearly dominate the bottom third of the ranking. Assessing changes over time, we observe that most top 10 performers in 2010 (including Singapore, the United States, Norway, Japan) were already members of this group in 1990 and 2000. More pronounced changes occurred at the bottom of the rankings. Sri Lanka and the Philippines improved their rankings most significantly among those countries that left the lowest group since 1990, while the rankings of Yemen and Zambia deteriorated most significantly. China jumped from 58th place in 1990 to 28th in 2010; India from 52nd to 34th. Yet, the overall ranking with respect to our global index on infrastructure appears to be fairly stable throughout the period of observation.

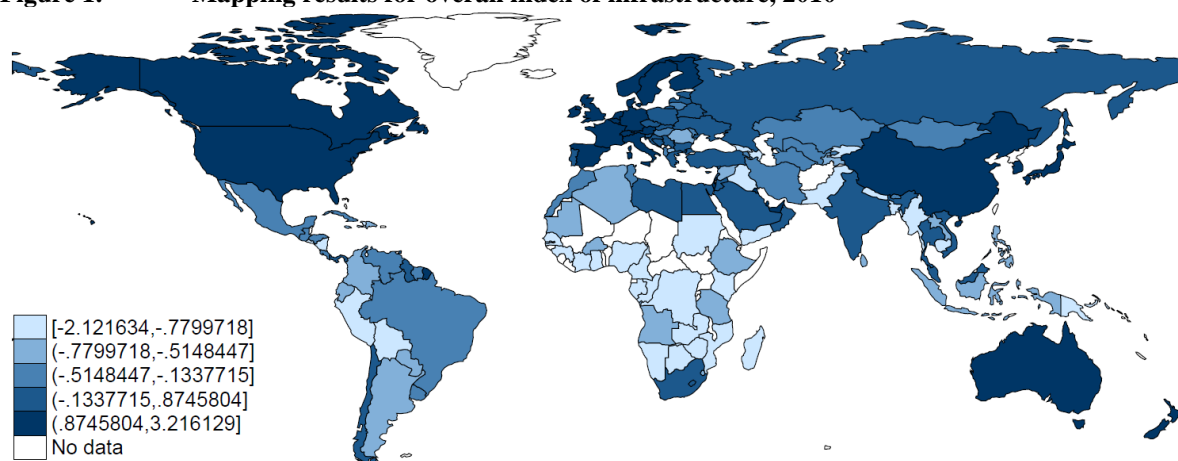
Figure 2 reveals that infrastructure is crucially important for a country's attractiveness in terms of the FDI inflows-to-GDP ratio. The magnitude of the effect of a standard deviation change in overall infrastructure on the FDI-to-GDP ratio considerably exceeds the effect of a one standard deviation change in the Heritage Foundation's index of freedom of investment or the countries' human capital endowment. This has huge implications: for example, if Bolivia, a lower-middle income country at the bottom of our ranking of overall infrastructure in 2010, managed to improve its

infrastructure to the mean level of developing countries, its FDI-to-GDP ratio would rise by almost one-third. Similarly strong effects are observed for the two sub-indices of transport and ICT infrastructure, while the effect appears to be weaker for financial infrastructure and ambiguous for energy-related infrastructure.

In future research, our global index may be used to estimate critical gaps in infrastructure (relative to a “normal” pattern of infrastructure to be expected for a developing country compared to countries of similar size and with similarly high per-capita income), assess the effectiveness of foreign aid in closing these gaps and evaluate the extent to which a country’s attractiveness to FDI can be improved through investment in infrastructure. Other issues include deficient infrastructure as a possible bottleneck for the productivity of (foreign and local) firms and economic growth. By overcoming previous data limitations, our index can help systematically to assess important links between infrastructure, FDI and economic development.

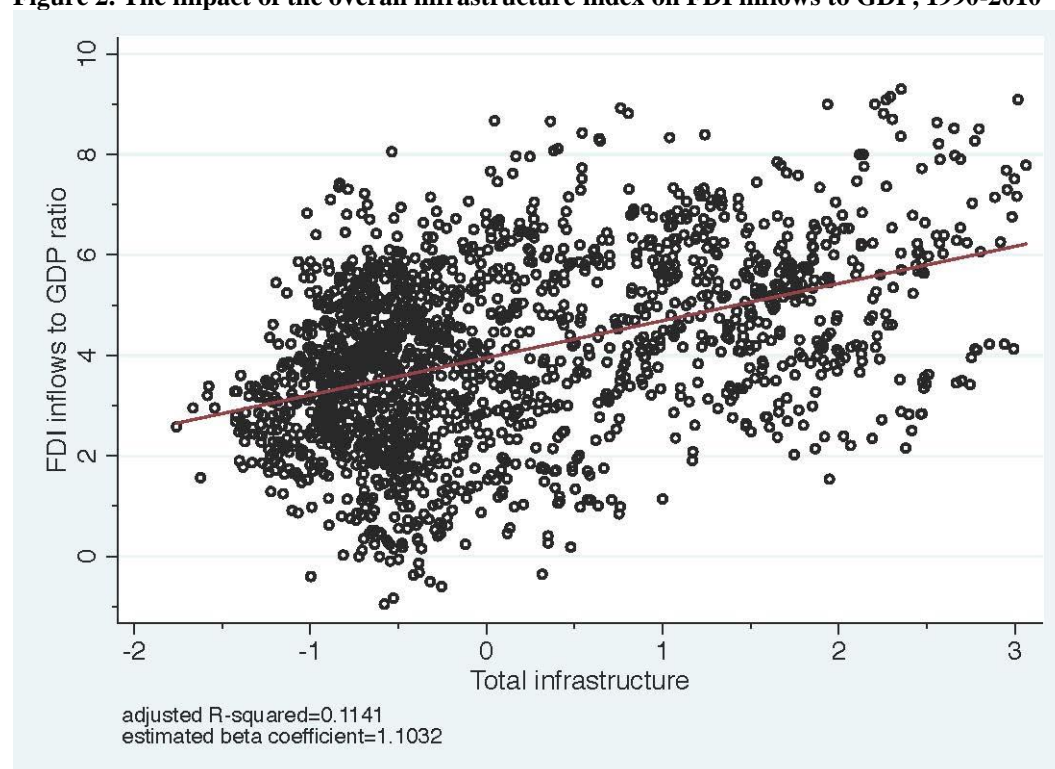
The identification of critical gaps in infrastructure would be particularly useful for policymakers in developing countries. First of all, policymakers could draw on a richer set of information to decide on the allocation of local government resources devoted to infrastructure. Strikingly different priorities emerge even when comparing neighbors: for instance, transport infrastructure appears to be the most critical gap in Mauritania, while the gap is minor with respect to communication. In contrast, communication and energy are the most critical constraints in Algeria. Second, policymakers would have a better basis for negotiating with foreign donor countries over the targeting of aid for infrastructure. Third, they could benefit from a better bargaining position vis-à-vis multinational enterprises. Detailed insights on the relative importance of different aspects of infrastructure as determinants of FDI inflows would render it easier to identify effective means of FDI promotion, rather than falling prey to the firms’ all too common demands for getting cheap and privileged access to infrastructure. Finally, it might become easier for policymakers in neighboring countries to identify bottlenecks to closer cross-border economic relations and regional integration, and to overcome these bottlenecks through negotiations on shared use of infrastructure.

Figure 1. Mapping results for overall index of infrastructure, 2010



Source: Donaubauer et al., op. cit.

Figure 2. The impact of the overall infrastructure index on FDI inflows to GDP, 1990-2010



Source: Donaubauer et al., op. cit.

Note: The underlying pooled regression over the period 1990-2010 controls for the host countries' GDP, GDP per capita, GDP growth, total years of schooling, and the Heritage Foundation's index of freedom of investment. All explanatory variables are lagged by one year.

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¹ See, e.g., Elizabeth Asiedu, "On the determinants of foreign direct investment to developing countries: Is Africa different?" *World Development*, vol. 30 (2002), pp. 107-119.

² See Julian Donaubauer, Birgit Meyer and Peter Nunnenkamp, “A new global index of infrastructure: Construction, rankings and applications,” Kiel Institute for the World Economy, Working Paper 1929, June 2014.

³ To combine data from different sources into aggregate infrastructure indices, we used an unobserved components model, where observed data in each area of infrastructure are a linear function of unobserved infrastructure and an error term.

⁴ More maps and detailed country rankings of infrastructure are available on request. Maps are also available for the critical gaps in infrastructure (discussed below).

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