The Global Infrastructure Gap: Potential, Perils, and a Framework for Distinction

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Fact 1

In poor countries, 1.2 billion people have no electricity and 1 billion live more than 2 kilometers from an all-weather road (Rozenberg and Fay 2019).

Fact 2

In April 2015, the World Bank claimed that by moving from “billions to trillions” in infrastructure investment in poor countries, rich-country private capital could: (i) close the infrastructure services gap, (ii) achieve the sustainable development goals, and (iii) make money.

Question:

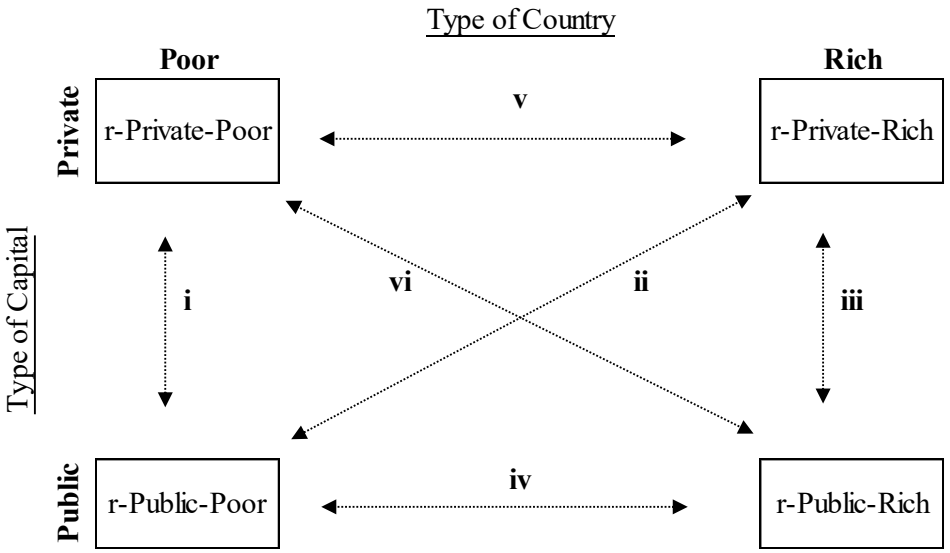
Is it true that poor countries have widespread potential for publicly efficient and privately profitable investment in infrastructure?

This Paper: Introduces a simple equilibrium framework that distinguishes those poor countries in which the Bank's three-fold claim is tenable from those where it is not.

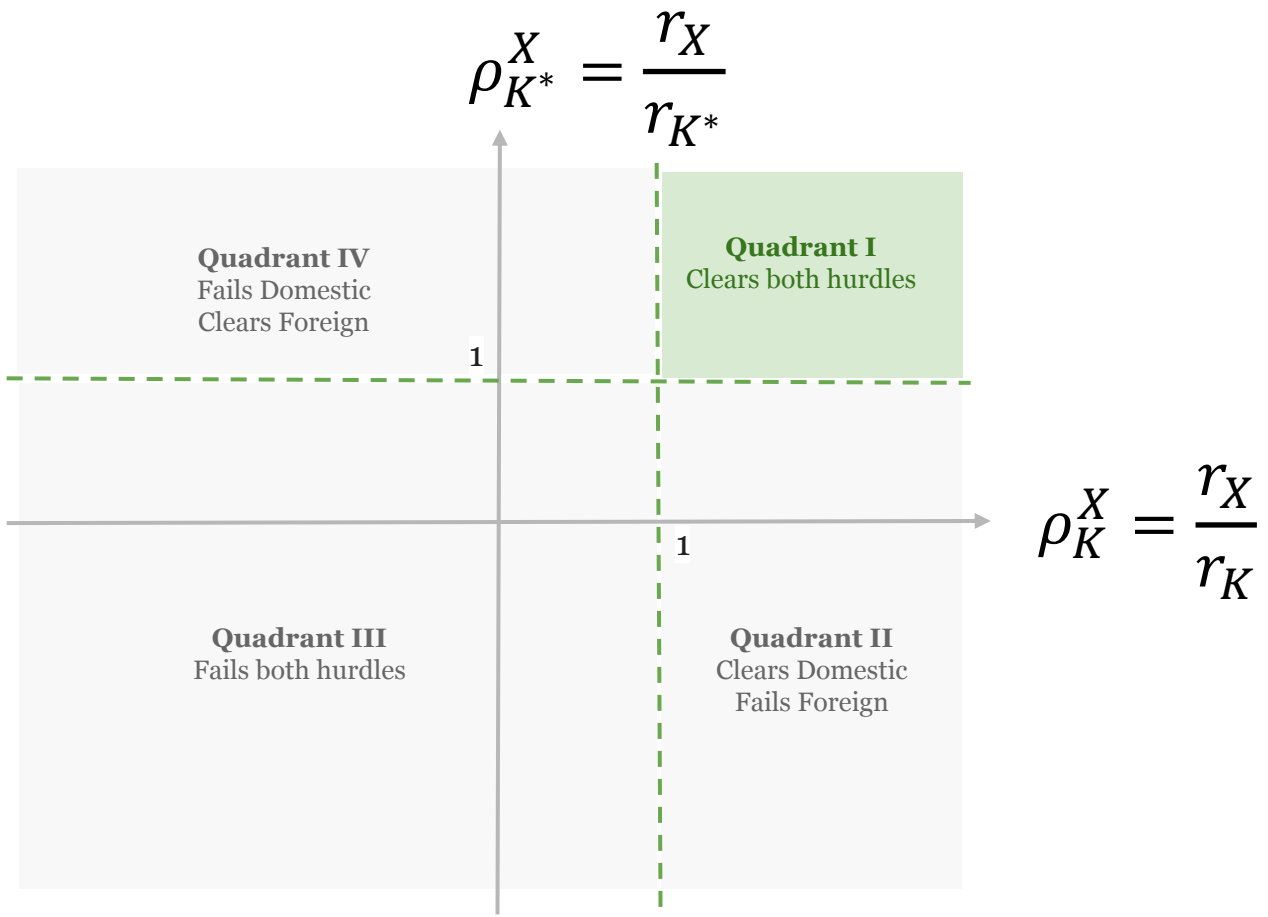
The Dual-Hurdle Framework: (1) provides a practical tool for setting infrastructure priorities; (2) can be applied to projects within countries as readily as it can to cross-country analysis.

Generating, validating, and making publicly available the data required to apply dual-hurdle analyses—both within and across countries—is an opportunity for the Bank to do well and good.

Potential welfare gains of capital flows from private-rich capital to public-poor capital are roughly 4.8 times larger than those from private-rich to private-poor (Lowe, Papageorgiou, and Perez-Sebastian 2018).



For a given poor country and type of infrastructure, the Dual-Hurdle Framework sorts each country-infrastructure observation into one of four quadrants according to whether it clears the hurdle for: (a) Domestic efficiency, and (b) Foreign profitability.



Where r_X : rate of return on infrastructure
r_K : rate of return on domestic capital
r_{K^*}: rate of return on foreign capital

Data

- Canning and Bennathan (2000): 53 poor countries; economic rates of return on paved roads, electricity generating capacity; rates of return on all capital. Same data for 16 rich countries. **Caution:** all data are from 1985.

- 26 poor countries have data on roads, 49 on electricity;

- Generate 75 country-infrastructure return observations, $(\rho_K^X, \rho_{K^*}^X)$ and confront them with the Dual-Hurdle Framework.

In comparison with WB communiqué, joint prevalence of efficient + profitable opportunities was modest .

- 21 of 53 countries did not clear the dual hurdles for roads or electricity.
- Of the 32 countries with projects that cleared the dual hurdles, only 7 did so in both roads and electricity.
- The reality that in 1985 less than 1/7 of countries presented a data-driven case for publicly efficient and privately profitable investment raises questions about the wisdom of “billions to trillions” three decades later.

Prevalence and Magnitude of Quadrant I Opportunities: Roads vs. Electricity

- Of 75 observations, 39 (21 roads, 18 electricity), spread across 32 countries, sorted into Quadrant I.

- Of the 21 Quadrant I observations in roads, the mean (median) return was 10.2 (5.99) times larger than corresponding return on rich-country capital.

- Of the 18 Quadrant I observations in electricity, the mean (median) was 2.2 (1.87) times larger than corresponding return on rich-country capital.

Alternative order-of-magnitude comparisons

- The average excess-return multiple on poor-country roads in 1985 was roughly 7 times the excess-return multiple on portfolio equity in poor countries, which, once their stock markets were liberalized, presented an arbitrage opportunity large enough to fuel the rise of the emerging-market equity fund industry.

- Tradable claims on poor-country infrastructure are still limited, but the dual-hurdle analysis provides a framework for distinguishing countries where the creation of tradable claims might be beneficial from those where it would not.

Conclusion: Too much has happened since 1985 to draw distinctions based on information from that year, but the new analysis of old data in this paper:

- (a) provides a template that can readily be applied to updated data (cross- and within-country) on the economic rates of return on various types of infrastructure; and

- (b) demonstrates the utility (and urgency) of the World Bank collecting and disseminating that data as soon as possible.