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?

“Yes”: McKinsey Global Institute (June 2016); JP Morgan Development Finance Institute (January 2020); White House (June 2022)

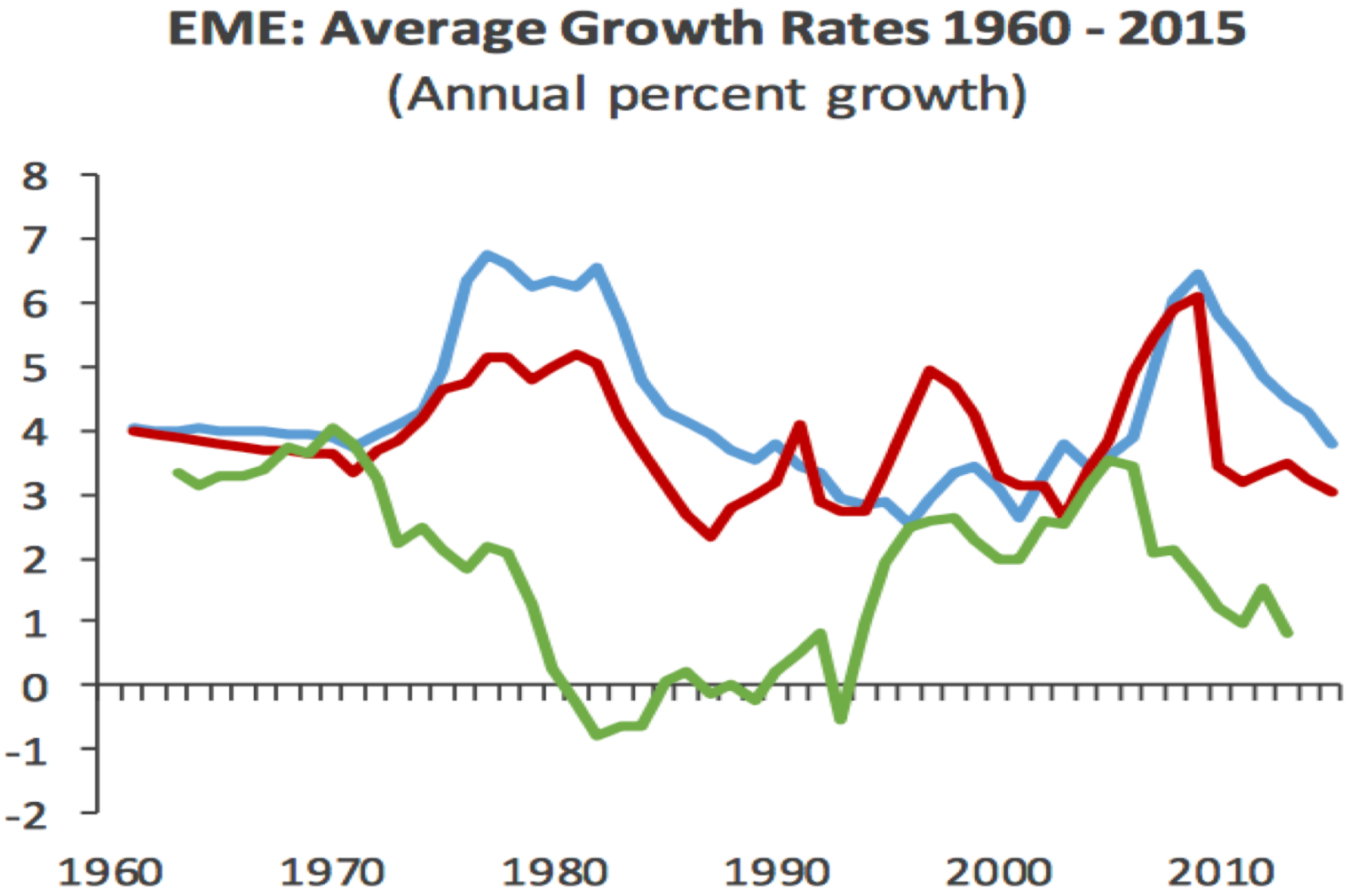
The notions of a "global infrastructure gap" and "needed investment" bear an unfortunate similarity to the "financing gap" of Harrod (1939) and Domar (1946).

Like the MGI conception, the Harrod-Domar Model asserts that a desired rate of growth requires a target level of investment.

Given national savings (or scheduled investment in the case of MGI), target investment implies a financing gap equal to the difference between the two quantities.

Armed with this framework, rich countries sought to help poor countries grow by filling the gap. They failed (Easterly 2001). Donors did not ask whether filling the gap with "needed" investment would actually correct some market failure, incentivize production, and endogenously raise incomes.

Déjà vu all over again…(Rogoff 1991; Easterly 2001; Signe 2018; Horn, Reinhart, and Trebesch 2019; Gallagher and Ray 2020)

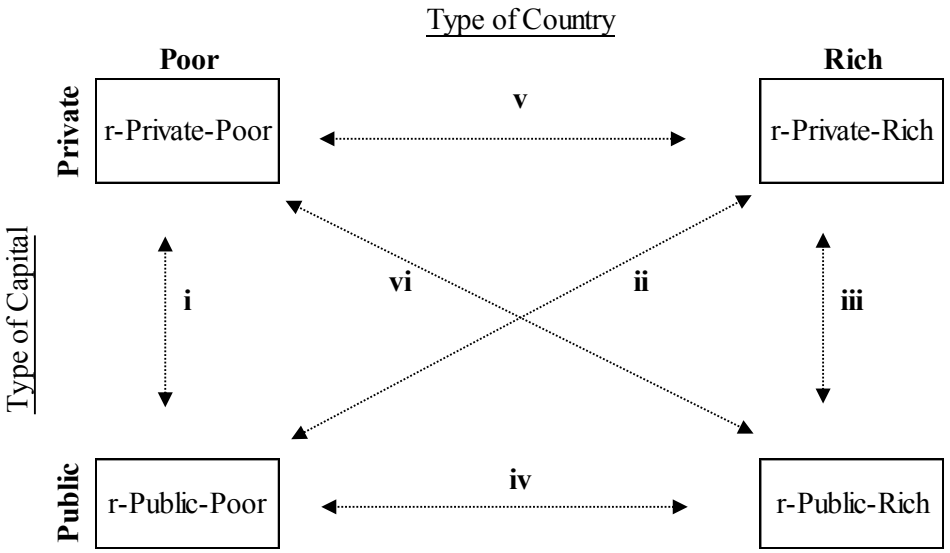


This Paper: Introduces a simple equilibrium framework that distinguishes those poor countries in which the Bank's three-fold claim is tenable from those where it is not.

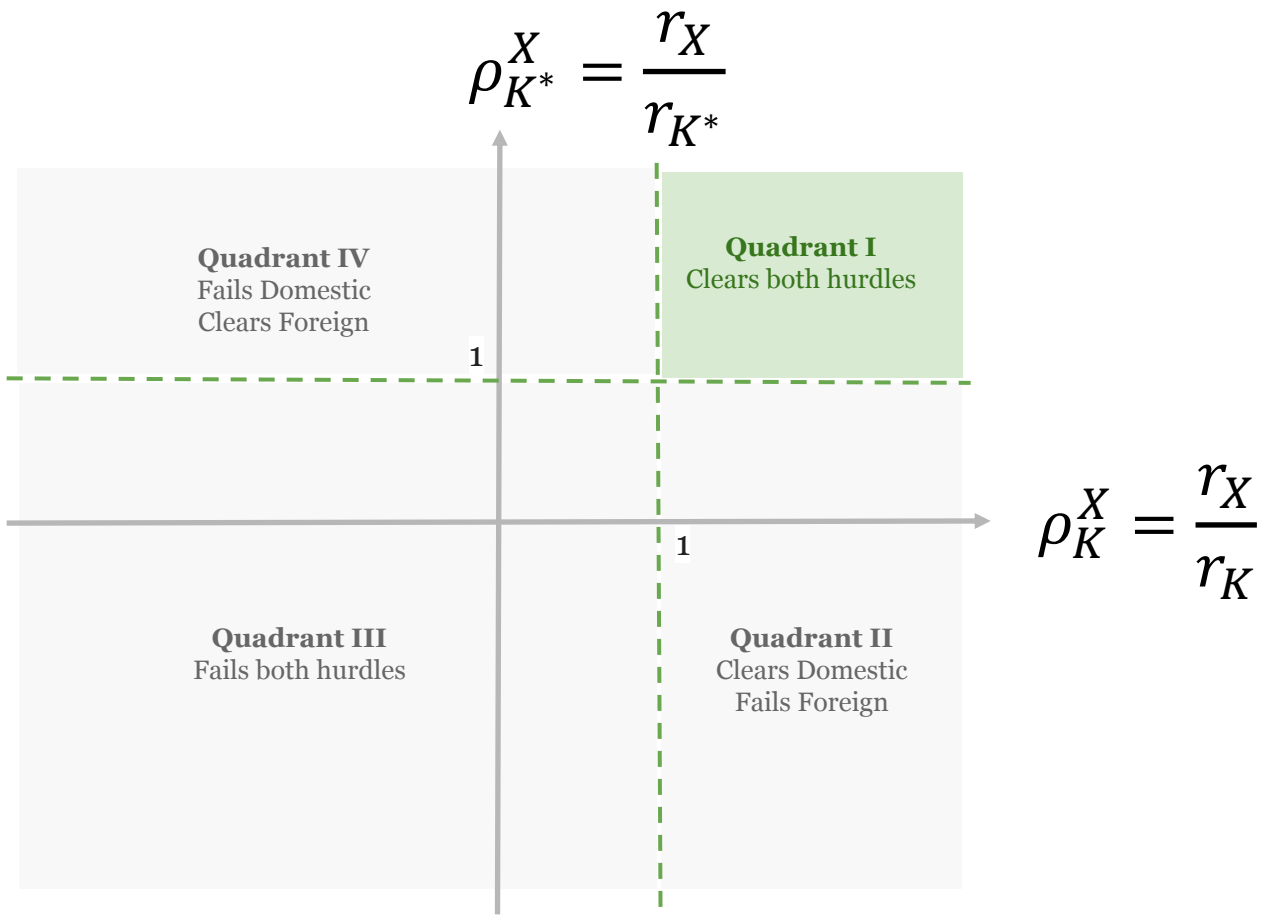
The Dual-Hurdle Framework: (1) provides a practical tool for setting infrastructure priorities; (2) can be applied to projects within countries as readily as it can to cross-country analysis.

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.

Lucas Paradox cannot explain the findings.

- Average return on all capital for poor countries is 1.4 times higher than rich-country average; 35 of 53 greater than rich.
- 10 of the 32 unique countries that had Quadrant I opportunities (roads or electricity) had a return on all capital less than the return in rich countries.
- Of the 7 countries that sorted into Quadrant I for both roads and electricity, 3—Argentina, Bolivia, and Kenya—had a return on all capital below that of the rich-country average.

Net inflows of portfolio equity to poor countries soared after they eased restrictions on foreign ownership of domestic stocks in the late 1980s and early 1990s.