What Kind of Trap? A Transition-Failure Definition and an Agent-Based Test across Eight Economies

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Abstract

The middle-income trap is among the most cited and least consistently defined concepts in development economics. We first redefine it and test the definition before adopting it: of three candidates confronted with five consensus country classifications under a rule fixed in advance, only the transition-failure variant reproduces all five, and on a corrected eight-country panel its non-income dimensions separate escaped from trapped economies where income growth does not. We then implement three leading mechanism families as interchangeable plug-ins on one agent-based substrate. They are distinguishable in principle, yet under pre-registered criteria in-sample fit succeeds in six of six countries while out-of-sample validation fails in eight of eight. The trap is not one thing; on twenty years of country data we cannot yet say which thing it is in any given case.

Keywords: middle-income trap, structural transformation, economic complexity, agent-based model, pre-registration, political economy of development.

Introduction

Since Gill and Kharas (2007) coined the term, the middle-income trap has framed the prospects of most developing economies: only 34 economies have moved from middle- to high-income status since 1990, while 108 remain middle-income, home to over three-quarters of the world's population (World Development Report 2024). Yet no single definition is accepted, and theory has splintered into Schumpeterian, capabilities, political-coalitional, macro-structuralist and complex-systems families.

Two problems are usually conflated. There is no agreed statement of what makes a country trapped, and several incompatible mechanisms claim to explain entrapment without ever being compared on common ground. A full-text reading of 64 studies published from 2011 to 2026 shows that the disagreement is structured rather than random (Figure 1): every dimension is treated substantively by at least half of the corpus and none dominates, which is what one multidimensional construct seen from different angles would produce.

We therefore ask which definition reproduces the classifications on which the literature agrees, and whether the three leading mechanism families can be told apart on available country data.

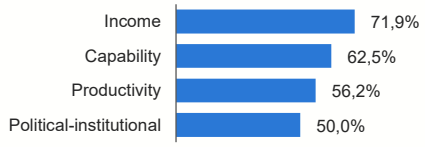


Figure 1. *Share of the 64 studies treating each dimension substantively (score ≥ 2 on a 0 to 3 scale).*

Research Method

1. Corpus classification. Each of the 64 studies was read in full and scored 0 to 3 on income, productivity, capability and political-institutional dimensions.

2. Definition test. Three drafts, A (persistence across dimensions), B (a multidimensional bad equilibrium) and C (failure of three simultaneous transitions), were fixed before testing and confronted with five consensus cases (Table 1).

Case	Consensus	A	B	C
South Korea	Escaped	Yes	Yes	Yes
Poland	Escaped	Yes	Tuned	Yes
Argentina	Trapped	Yes	Yes	Yes
Brazil	Trapped	Yes	Yes	Yes
Malaysia	Trapped	Tuned	Tuned	Yes
Consistent without tuning		**4 / 5**	**3 / 5**	**5 / 5**

Table 1. *Agreement with consensus cases. Tuned: matches only with thresholds calibrated to the case.*

Only Draft C needs no case-specific tuning. Malaysia is decisive: its income kept rising, so income-based drafts see no slowdown, yet the literature classifies it as trapped.

Definition v1. The middle-income trap is the failure of a middle-income country to accomplish three simultaneous transitions associated with graduation to high income: (i) productivity, from factor-driven to productivity-driven growth; (ii) capabilities, from imitation to innovation; (iii) institutions and coalitions, from hierarchical capitalism or segmentalist skills formation to developmental governance. The failure is structural after 15 or more years in the middle-income range with no upward break on at least two of the three.

3. Panel data. Eight economies, 1990 to 2020, from seven official sources (PWT 11.0, WDI, Atlas of Economic Complexity, WGI, V-Dem, UNESCO UIS, Polity5). A pre-specified audit caught a column permutation that had shown Malaysia, the worst productivity performer (−0.42 percent a year), as the best (+1.48).

4. Agent-based test. Three mechanisms run as plug-ins on one neutral substrate (Figure 2) and are fitted by ABC-SMC to annual trajectories of four observables over 1990 to 2010, with 2011 to 2020 held out and four decision points pre-registered.

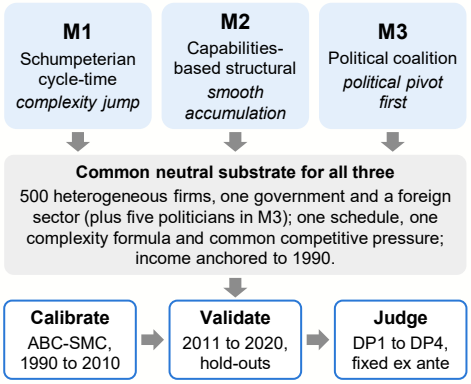


Figure 2. *Mechanisms as plug-ins on one neutral substrate (italics: signature).*

Discussion & Result

The definition tracks the data. Every escaped economy records positive mean TFP growth over 1990 to 2010, and three of four trapped or transition economies record negative growth, whereas no income-growth threshold separates the groups (Figure 3).

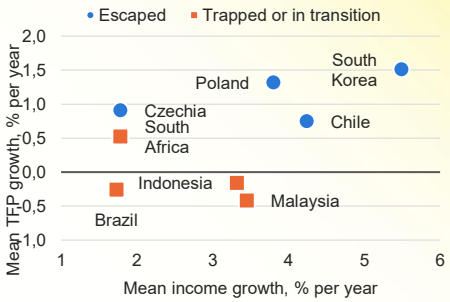


Figure 3. *Mean TFP growth against mean income growth, 1990 to 2010, corrected panel.*

Malaysia, on which the definition was selected, pairs strong income growth (3.45 percent a year) with the panel's lowest TFP growth (−0.42), near-flat complexity and its lowest polyarchy (0.28). South Africa fails on capability and institutions instead, and Chile escaped without the capability transition.

The mechanisms cannot yet be told apart. In principle they can: across 400 parameter draws each reaches both escape and entrapment, and the Schumpeterian jump signature separates throughout. Yet the pre-registered verdict is null:

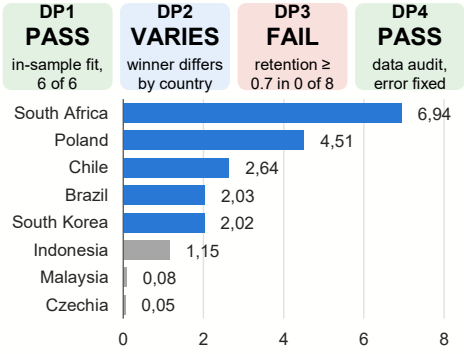


Figure 4. *Winner versus runner-up: gap in fit divided by its noise over 20 unseen seeds (blue: 2:1 or better).*

The estimator is precise but not predictive: rankings repeat under re-simulation, yet the fits say nothing about the next decade; in Malaysia and Czechia the winner flips with the seed.

Conclusion

The trap is the failure of three simultaneous non-income transitions: a country can be trapped while its income rises. The definition already works as a diagnostic of which transitions failed (Malaysia: productivity and capability; South Africa: capability and institutions; Chile: capability). Attributing mechanisms needs more observables per country, a political observable, longer validation windows and replication budgets set by mechanism variance.