



## MRR INNOVATION LAB PROJECT IN BRIEF

# MEASURING RESILIENCE IN THE PRESENCE OF POVERTY TRAPS

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**Development Innovation**  
Resilience definition and measurement and empirical test for poverty traps

**Commodity**  
Multiple

**Targeted Population**  
Small-scale agricultural households

**Country/Location**  
Global

**Timeline**  
2022-2023

**Funding**  
\$30,770 (USAID)

An array of technical definitions and measures of resilience have pushed forward broader thinking on how people move into and out of poverty. This MRR Innovation Lab project refines the technical definition of development resilience and proposes a measure for resilience that takes potential poverty traps into account. This project also tests existing methods to detect poverty traps and highlights the importance of shocks and unnecessary deprivation. The research team will apply its proposed resilience measure and test for poverty traps on a number of existing high-quality panel datasets from around the world.

### The Challenge

Measuring resilience in the field is not an easy task. The data needed to measure resilience is rare. Even when suitable data is available, there are considerable differences in existing methods used to quantitatively measure it.

A limitation of current frameworks for resilience is how they define recovery after a shock. For example, one definition of resilience is the ability to avoid very low levels of income or consumption, such as those below the poverty line.<sup>1</sup> However, by this definition any household that stays above poverty after a shock can be considered resilient in spite of how much they might have lost or how little of that loss they have been able to recover.

Definitions of resilience based on a set threshold like poverty also miss differences in levels of recovery. There is a fundamental difference between the ability to only avoid falling into poverty and the ability to recover from a shock to where a household would have been had the shock not occurred.

The presence of a poverty trap also significantly affects the possibility of resilience. Poverty traps are mechanisms that reinforce poverty and that may keep a household from ever recovering from a shock.<sup>2</sup> Resilience, which is the ability to recover or avoid collapse in the

### RESEARCH INNOVATION

The main analysis for both of these projects will be conducted with data generated from a simulation of two sets of dynamic economic models: one that contains a poverty trap and another that does not. Because of the complexities related to resilience and poverty traps, the analysis starts with simulated data that provides outcomes of a dynamic process grounded in economic theory that presents clear counterfactuals in a controlled setting.

This rich data generated by dynamic models with and without poverty traps makes it possible to illustrate the complexities current measures of resilience do not capture and highlights how this project's proposed measure can improve. Moreover, varying the amount and quality of data obtained from the simulation will show the data requirements needed to measure resilience effectively.

The simulation-generated data will also be used to assess the effectiveness of standard tests of poverty traps while systematically adding complexities and constraints that reflect those found in real-life panel data. The most effective measures and tests that result will be applied to panel data collected from around the globe.



face of shocks,<sup>3</sup> may be hampered if a poverty trap is present. However, there is continued debate about whether it is possible to empirically identify poverty traps in complex settings and even whether or not they exist.

## Research Design

This MRR Innovation Lab project aims to further our understanding of development resilience and its measurement. This project also incorporates the complexities that poverty traps would present. Moreover, the project tackles the difficulties in detecting poverty traps with observational data. The effectiveness of different measures of resilience and tests for poverty traps will be assessed using simulation-generated data and then applied to high-quality panel datasets from around the world.

The data to validate various measures of resilience and tests for poverty traps is generated from a simulation of two sets of dynamic economic models, one with a poverty trap and the other without one. This data includes all the complexities of resilience and poverty traps but in a controlled setting in which to estimate the impacts of shocks in multiple scenarios.

This project's definition of resilience is the ability to quickly recover from a shock to the same level of income as if there had been no shock at all. This definition clearly differentiates between levels of recovery, which can show a development program's comparable ability to support recovery from shocks.

This project overcomes some of the challenges of detecting poverty traps with survey data using standard empirical methods when there are realistic complexities, such as people having different abilities, or common statistical challenges. This project will also provide guidelines of the data requirements needed to accurately test for poverty traps in complex settings where people have varying sources of income and levels of assets and ability, and will differentiate

between unnecessary deprivation and differences based on people's preferences or personal characteristics.

This project runs parallel to a randomized controlled trial (RCT) of a community health program in Mozambique that is collecting panel data on households who were affected by Cyclone Idai in 2019. This project's methods on resilience and poverty traps will be used to measure the effectiveness of the community health program at improving household resilience.

## Development Impact

This project has policy implications anywhere poverty and economic vulnerability exist. An accurate measure of resilience and a reliable test for poverty traps make it possible to target social programs to the most vulnerable communities.

This project contributes significantly to efforts to empirically identify poverty traps with survey data from settings more complex than where households rely on a single source of income. Recent evidence from Bangladesh<sup>4</sup> has renewed debate about the existence of poverty traps in complex settings.

This project also has implications for inequality in rich countries in which a poverty trap can perpetuate inequality and reduce mobility. In developing countries, poverty traps are usually modeled as a fixed cost that acts as a barrier to more productive agricultural technologies like fertilizer. In a country like the U.S., this up-front cost would be a college degree.<sup>5</sup>

<sup>1</sup> Cisse, J., et al. 2018. "Estimating development resilience: A conditional moments-based approach." *Journal of Development Economics*.

<sup>2</sup> Barrett, C., et al. 2013. "The economics of poverty traps and persistent poverty: Empirical and policy implications." *Journal of Development Studies*.

<sup>3</sup> Barrett, C., et al. 2014. "Toward a Theory of Resilience for International Development Applications." *Proceedings of the National Academy of Sciences*.

<sup>4</sup> Balboni, C., et al. 2021. "Why do people stay poor?" National Bureau of Economic Research.

<sup>5</sup> Arunachalam, R. et al. 2017. "Poverty traps, convergence, and the dynamics of household income." *Journal of Development Economics*.



## Development Opportunity: Mozambique

- 32.1** : Population in millions (2021)
- 64.6%** : Poverty rate at \$2.15/day, 2017 PPP (2014)
- 20** : Rural population in millions (2021)
- 70%** : Total employment in agriculture (2019)
- 33%** : Prevalence of undernourishment (2020)
- 37.5%** : Prevalence of stunting for children under 5 years (2020)

Source: World Bank

Mozambique has among the best records of sustained economic growth in Africa, averaging 7 percent per year over the last decade. However, poverty and undernutrition rates remain high in a country that is acutely vulnerable to drought, flooding and tropical storms.

Poverty and food insecurity are the main underlying causes in Mozambique of chronic undernutrition. Food availability is limited by low yields and inadequate access to markets for many citizens.

Mozambique is the second-largest formal exporter of food in the southern Africa region and could progress toward a trade surplus if regulation and agricultural practices improve. Its strategic location and trade corridors make the country a key player in regional and global food security.

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