John McPeak   Field: Development Economics

Resilience in the kind of economics I do is most commonly approached by using dynamic modeling techniques such as dynamic programming or optimal control. We seek to understand the likely path resource stocks will follow over time and the implied flows from these stocks that will be generated. We frequently invoke the idea of a steady state equilibrium as the solution concept; where will the system evolve to such that there is no force internal to the model that will lead to further change? At this point, the system is at steady state equilibrium and will remain there until an exogenous shock occurs. We may also be interested in understanding the nature of the 'path' to the equilibrium from a given set of initial conditions. From a given starting point, do the forces internal to the model lead us to the steady state or away from it?

Where this becomes useful to my work is if we discover that there may be multiple steady states that differ qualitatively.   Some of the work I have been involved in investigates the implications of multiple steady states. For example, if we allow the possibility of increasing marginal returns to an asset over certain ranges of the production function and the usually assumed diminishing marginal returns elsewhere, we have the possibility of three different steady states. One is a low asset poverty trap and this has multiple paths to it from the initial conditions in the neighborhood around it. This kind of steady state is resilient in that the system will return to it after perturbation. A second is an unstable threshold where the point is a steady state but there are no points in the neighborhood around it that lead back to it – it is a steady state that is not resilient. If perturbed from this steady state by an exogenous shock, the system will move toward one of the other two steady states rather than returning to the threshold point.   The third steady state is a high asset high well being steady state. There are many paths to this steady state from the neighborhood around it so it is resilient to perturbation.

My work with this set of tools has looked at livestock ownership as the asset. In a variety of settings in eastern Africa, we are developing some empirical evidence that something like this seems to capture essential facts about livestock ownership over time at the household level. There is a threshold herd size of around 7-10 cattle per household. Above this, one is likely to be able to make it through droughts (which occur once every four to five years) with a large enough herd to recover, maintain livestock mobility in the extensive rangelands, and avoid destitution. Below this, one is likely to slowly be drawn down to a sedentary live in town with a few sheep and goats, and seek income sources not directly reliant on livestock and livestock products.

The policy story that results is that we may be able to target this threshold group with technologies that address this issue. One response is insurance targeted at keeping people with an asset level above the threshold. That is what we are working on in Kenya currently. Another response is improving the production and use of supplemental feeds. That is what we are working on in Mali currently. We are also working with policy makers to develop policy responses that differ based on where a household may find themselves. People in the low income low asset equilibrium need policies to get out of the trap (alternative income opportunities, cash transfers, food transfers, human capital development, outmigration alternative,…) while those near and above the threshold need another kind of policies to avoid the trap (functioning markets for inputs and for livestock, insurance to help store

wealth over time, land use management to avoid long term damage to the biophysical foundation of the livestock production system,…). In a sense, we are trying to make the poverty trap equilibrium less resilient, and the neighborhood about the high asset equilibrium more resilient and larger.   In this field I would note the work of Michael Carter, Chris Barrett, Stephen Durlaf, and Costas Azariadis.

The other context in which I use a concept like resilience is when I engage in questions about a lack of resilience. This is work on what are called fragile states, failed states, low-income countries under stress, difficult partnership countries,… Part of development economics is related to questions about how one improves the well being of people in situations where conflict and / or governance failure have become disruptive to people's lives. Here we often rely on measures such as the governance indicators (KKZ or KKM or KK sometimes are used as shorthand for these) or the failed states index (Foreign Policy magazine and the Fund for Peace).

Here the set of questions can be how do people operate economically in such settings; how do people remain linked to the global economy in such settings; how can donor aid be best used in such settings; how do poor governance and conflict influence economic behavior; and what can be done to improve governance and end conflict?

This is part of a larger movement in economics that looks at the role of institutions in economic growth. A variety of studies over the past few years have arrived at the conclusion that one of the key explanations for different growth experiences (and the resulting differences in standards of living around the world) is the differing quality of institutions in particular countries. The general finding is that there is pretty strong evidence that good institutions foster rapid economic growth. It is a little less clear what leads to better institutions. Some of the key authors here have been Dani Rodrik, Daron Acemoglu, James Robinson, Jean-Phillipe Platteau, William Easterly, Avner Greif, and Paul Collier.