

**Risk and Asset Management in the Presence of Poverty Traps:
Implications for Growth and Social Protection**

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1. A Behavioral Approach to Poverty and Vulnerability

The quantitative analysis of poverty is almost always built around a poverty line, defined as the amount of money needed to purchase a minimal bundle of goods. The same observation applies to the emerging literature on vulnerability measures (e.g., Calvo and Dercon 2005, Christiansen and Boisvert 2000, Christiansen and Subbarao forthcoming, Elbers and Gunning 2003, Gamanou and Morduch 2004 and Ligon and Schechter 2003). While these latter measures are meant to be more forward-looking than standard poverty measures, telling us about the likelihood of future deprivation rather than about already realized deprivation, their shared dependence on a money-metric poverty line exposes them to many of the same criticisms that swirl around standard poverty measurement.

The goal of this note is to suggest a behavioral approach to poverty and vulnerability that escapes this troublesome dependence on an arbitrary money-metric poverty line. More importantly, our approach, which is based on an empirically estimable dynamic asset poverty threshold, has immediate implications for both the linkage between poverty, risk and growth and for the design of social protection policies.

Calvo and Dercon (2005, p. 3) make the important observation that the common thread in definitions of economic vulnerability is a “sense of insecurity, of potential harm people must feel wary of—*something bad can happen and ‘spell ruin’* (emphasis added). The notion that a random event (a flood, a drought, an illness, an unemployment spell) can have permanent effects, spelling ruin for a family, suggests that vulnerability (and perhaps poverty) can best be understood through the lens of poverty traps, where poverty traps are in turn understood as a

critical minimum asset threshold, below which families are unable to successfully educate their children, build up their productive assets and move ahead economically over time. Identifying that critical minimum asset threshold empirically would thus offer a behavioral approach to poverty and vulnerability measurement. Below the threshold lie those who are ruined, who can do no better than hang on and who are offered no viable prospects for economic advance over time. Those above the threshold can be expected to productively invest, accumulate and advance. The bifurcation of behavior reflects the bifurcation of longer-term prospects and thus of welfare status. This framework allows temporary shocks to have permanent adverse consequences for those knocked beneath the threshold, while others – who do not cross between regimes – can recover fully and quickly from an objectively similar shock (Dercon 2004).

The remainder of this note is organized as follows. Section 2 summarizes a conceptual perspective on poverty traps and defines the dynamic asset poverty threshold (or Micawber threshold). Section 3 then considers the implications of the Micawber threshold for households vulnerable to and coping with a risky environment. These considerations suggest two ways to identify the Micawber threshold: tests for asset smoothing behavior and tests for bifurcated/split accumulation dynamics. Section 4 reports on two efforts to identify this threshold. The first applies the sample splitting, threshold econometric approach of Hansen (2000) to the analysis of household accumulation dynamics in the wake of the destructive 1998 Hurricane Mitch in Honduras. The second effort involves elicitation of perceived state-dependent growth dynamics so as to simulate state-and-ability dependent thresholds faced by southern Ethiopian pastoralists. Finally, Section 5 closes with reflections on the implications of well-identified dynamic asset poverty thresholds for the design of social protection policies.

2. Poverty Traps and The Dynamic Asset Poverty Threshold

The notion that bad events can spell ruin suggests that households face the possibility of multiple equilibria. If a household falls too far, then the suggestion is that it would become trapped at a low equilibrium, and over the longer term diverge from its more fortunate neighbors. For example, Lybbert et al. (2004) find clear evidence that Ethiopian pastoralists' propensity to recover from shocks to herd sizes depends heavily on whether they have fallen below a critical minimum herd size.

In a recent paper (Carter and Barrett, forthcoming), we review the economics of poverty traps in some detail. Drawing an analogy between the convergence of per-capita income between nations, and convergence of household incomes within nations, we note that convergence failures can occur for two reasons:

1. *Club Divergence* when groups of individuals or countries that share similar intrinsic characteristics (*e.g.*, time preferences, skills, geographic endowments) tend to converge to a living standard that is unique to their group or club. While there is convergence within clubs, there is divergence between clubs.
2. *Multiple Equilibria Divergence* can occur when there is no unique equilibrium for a individual or country. Instead, controlling for intrinsic characteristics, both a high and a low level equilibrium are available to the individual. Whether the individual or country reaches the high level equilibrium, or remains trapped at the low level equilibrium, depends on whether the country begins above or is able to boost itself over a critical minimum threshold level.

It is of course the latter that is of most interest to this paper. At the level of individual households, multiple equilibria can exist when access to capital is limited and there some force that creates locally increasing returns to wealth, such as:

1. The underlying income generating process directly exhibits increasing returns to scale, either because the primal technology exhibits locally increasing returns or because input (output) prices or transactions costs are negatively (positively) related to scale over some significant range;

2. Some high return production processes require a minimum project size such that only wealthier households can afford to switch to and adopt the high return process; or
3. Risk and financial market considerations cause lower wealth households to allocate their assets so as to reduce risk exposure, trading off expected gains for lower risk, thereby making expected marginal returns to wealth lower for lower wealth households.

The key question then becomes whether or not in the face of locally increasing returns, the savings and accumulation behavior of poorer households will be driven by these low marginal returns. A forward-looking household would know that while the marginal returns to further accumulation are low, increased accumulation has strategic value in moving the household closer to the asset level(s) where returns sharply increase. Clearly the household's first best option would be to borrow sufficient funds so that it could leap forward to a higher return asset level. Increasing returns would therefore not suffice by themselves to trap poor households at low asset levels.

If, however, poor households are rationed out of credit markets, as a now voluminous literature suggests, or if they lack socially mediated access to capital (as Mogues and Carter (2004) suggest they would in many polarized societies), then discrete jumps mediated by borrowing may not be possible. In the face of exclusion from financial markets, the poor household's only option would be to move forward slowly with an autarchic savings strategy. Note that this autarchic approach would require substantial short-term sacrifice (diminished consumption) with little return even in the medium term (as marginal returns to new assets are low until the household reaches A_S). If the poor household finds it desirable and feasible makes this sacrifice, then it will—with sufficient time—reach the asset level necessary to achieve the higher returns and will eventually converge toward the asset and income levels of initially wealthier households. But many very poor households cannot afford to reduce consumption further, or at least the opportunity cost of tightening their belts further – e.g., in terms of

foregone energy for work, withdrawing children from school, etc. – make autarchic accumulation unattractive. If the poor household opts not to undertake extraordinary savings, it then settles into a poverty trap. The critical asset level at which the household decisionmaking bifurcates (below that level the household sinks to the low level equilibrium, above it they move toward the high equilibrium) is the *dynamic asset poverty threshold*, or the *Micawber threshold*.¹

3. Coping with Economic Shocks In The Face Of Poverty Traps: Asset Smoothing and Long Term Ruin

Dynamic asset poverty thresholds have direct implications for the persistence of poverty (Carter and Barrett, forthcoming). They also have implications for how households behave in the face of economic shocks, and for the long-run consequences and costs of such shocks. First, we expect to see households close to the threshold engage in asset smoothing, rather than consumption smoothing, when hit by income shocks. Given the endogeneity of future well-being and the natural dynamics underlying an asset stock, asset smoothing households reduce consumption so as to preserve asset stocks when hit by a shock. The coping strategies literature is replete with examples in which households intentionally destabilize consumption, for example dropping to a single meal per day, in order to avoid selling off key productive assets (see Barrett 2002 for a review).

While there has been some mention of asset smoothing in the descriptive literature (see xxx), and at least one theoretical treatment (Zimmerman and Carter, 2003), perhaps the most

¹ We owe this label to Michael Lipton (1993), who wrote of a “Micawber Threshold,” below which it is difficult for agents ever to accumulate assets. Lipton’s label is based on Charles Dickens’ character Wilkins Micawber (*David Copperfield*) who extolled the virtues of savings with his statement ‘Annual income twenty pounds, annual expenditure nineteen nineteen and six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery.’ The Micawber threshold divides those able to engage in a virtuous circle of savings and accumulation from those who cannot.

compelling demonstrations of this phenomenon are Hoddinott's (forthcoming) strategy of coping strategy by small farmers in Zimbabwe and Barrett et al.'s (2005) findings among northern Kenyan pastoralists. Based on anecdotal evidence, Hoddinott defines two cattle or oxen as the key threshold around which strategies bifurcate. Using dynamic panel data methods, Hoddinott estimates that households above that threshold sell livestock and protect their consumption standard (*i.e.*, consumption smooth) in the face of drought-induced income losses. Below that threshold, households do not sell assets, and instead cope with income loss via decreased consumption (*i.e.*, they asset smooth).²

Similarly, Barrett et al. use repeated observations on pastoralist households to establish that households do not necessarily manage their assets so as to smooth consumption. They offer simple nonparametric regression findings that the variability of household expenditures exceeds that of income below a dynamic asset poverty threshold, but not above it. Consumption smoothing is not universally practiced, especially not by poorer households intent on conserving what little wealth they still possess.

In demonstrating this bifurcated behavior, Hoddinott and Barrett et al. potentially explain seemingly anomalous findings, such as that in Fafchamps, Udry and Czukas' (1998) West African study.³ Those authors report that those who sell cattle do so in order to smooth consumption. However, when they regress livestock sales on shocks, they fail to find the evidence of consumption smoothing via livestock sales. A likely explanation is that behavior in their sample is bifurcated, and that there are two distinct (and offsetting) regression regimes.

² Carter et al. (2005) report similar findings from Ethiopia.

³ McPeak (2004) presents a model and panel data econometric evidence that households balance consumption smoothing and asset smoothing objectives in livestock sales. While this model does not incorporate the possibility of poverty traps and bifurcated accumulation or risk management strategies, it does underscore that households have a strong incentive to smooth assets when income is endogenous to asset holdings.

The behavior of the asset smoothers (who of course did not answer questions about why they sold livestock) offsets that of the consumption smoothers.

While asset smoothing behavior can clearly be logical from a dynamic perspective in the face of a poverty trap, the costs of this behavior are potentially substantial. In related work, Hoddinott and Kinsey (2003) show that Zimbabwean households that coped with drought losses via consumption reductions paid a heavy cost in the form of lost human capital. In particular, they show that young children in these households suffered irreversible losses in growth velocity. Treating the latter as measure of nutritional status, learning ability and ultimately a reliable predictor of adult productivity, the suggestion of the Hoddinott and Kinsey work is that asset smoothing strategies—themselves products of poverty traps— may ultimately represent a highly destructive form of risk management, where perhaps much of the cost is paid in the future.

Dynamic asset poverty thresholds have a second implication for behavior in the face of economic shocks. Shocks that directly destroy assets (such as hurricanes and landslides that wash away soil, destroy plantations, kill people and livestock) potentially create a grotesque experiment in which a subset of the worst-hit population is exogenously pushed below the asset threshold. In this case, we would expect to see another sort of behavioral bifurcation in the wake of the shock. Those pushed below the threshold should shift toward a ruinous lower equilibrium, while those that exited the shock above the threshold should be able to rebuild toward their former position. Carter *et al.* (2005) analyze post-hurricane asset accumulation trajectories for Honduras and find evidence consistent with such a bifurcating process.⁴ Indeed, their results imply that an otherwise convergent process is offset for households pushed below a threshold.

In summary, poverty traps imply that shocks can generate two sorts of processes that have damaging long term effects, reducing growth, and the growth potential of an economy.

⁴ The Carter *et al.* paper fails, however, to precisely identify the threshold.

Information on the location of the threshold could clearly generate large social returns if used to inform the design of social protection policies. However, before turning to the discussion of those implications, the next section will briefly consider novel ways and ideas for identifying these critical dynamic asset poverty thresholds.

4. EMPIRICAL STRATEGIES TO IDENTIFY THE MICAWBER THRESHOLD

Identification of the Micawber threshold is a formidable empirical challenge for multiple reasons. First, as it represents an unstable dynamic equilibrium, one should not find many observations around any point away from which agents are expected to move (Barrett 2005). Second, in the presence of sunk costs to investment and uncertainty, the threshold may vary systematically depending on whether one approaches it from above or below (Dixit and Pindyck). Third, and more generally, there are surely considerable household- and community-specific unobservable effects that determine the location of the threshold, which likely moves over time in response to unobservable changes in the overall environment. Identification controlling for such cross-sectional and intertemporal unobservables can be tricky. Finally, the inherent nonlinearity of the processes under consideration and the multi-dimensionality of the asset space over which one should really model these phenomena add further complexity to the challenge. Efforts to date to identify points at which accumulation strategies and risk responses bifurcate remain very much in their infancy. There is great promise in advances in this domain.

In this section, we briefly describe two recent, innovative attempts at identifying the role of risk in welfare dynamics in the presence of a possible Micawber Threshold. The first describes an econometric approach based on Hansen's (2000) threshold estimator. The second reports on an experimental approach using a nonparametric estimator.

4.1 Threshold Estimation using Data from Post-Mitch Honduras

Hurricane Mitch carved a path of destruction across Honduras in 1998. Some 30 months after Mitch, a sample of 850 rural Honduran households (clustered in 30 municipalities spread across 6 provinces) was surveyed as part of a study on the impact of land market liberalization and asset accumulation.⁵ Included in the questionnaire were a number of retrospective questions that probed the direct impacts of Mitch on household assets and income. The study also collected data on household assets in 2000/2001, giving a window into the longer term patterns of asset cycles and poverty traps.

Descriptive statistics calculated from this data (reported in Carter *et al.*, 2005) indicate that the shock of the hurricane disproportionately affected poor households. Across all pre-Mitch wealth quartiles, 44% of households lost productive assets in the hurricane. Not surprisingly, compared to households with losses, households without losses show substantially higher growth in their stocks of productive assets from the period before the hurricane to the period 30 months after the hurricane. However, the magnitude of the shift is quite distinctive across wealth quartiles. Households in the lowest (pre-hurricane) wealth quartile had median asset growth of 8.8% if they did not experience any losses, whereas the figure dropped 13.8 percentage points to -5% growth for households with losses. The growth gap between those with and without losses is a smaller 5.1% points for the wealthiest quartile (-2.1% versus 3% post-Mitch growth). This relative lack of recovery by the initially less well-off is consistent with the idea that the hurricane spelled ruin for at least a subset of these households as some were

⁵ This sample is comprised of two distinct sub-samples: panel and cross section. The panel households (500) originate from a study conducted in 1994 (Lopez and Valdes, 2000) in which 450 farm households were interviewed to analyze the impacts of the initial land titling programs. The 2001 survey attempted to follow both these baseline households and the land they cultivated. Of the original baseline households, 362 were resurveyed. In addition, 138 "new" panel households were added. In 2000, these households were cultivating land that had been worked by the original panel households in 1994. The remaining 350 cross-sectional households were added in regions that were not covered in the 1994 study. Households that were not operating their own farm in 1998 were eliminated from the sample for purposes of this study, reducing the total number of households to 821.

knocked off course toward a lower equilibrium. Using an econometric methodology different than that proposed here, Carter *et al.* (2005) find further evidence that lower wealth households that suffered shocks have fallen into a poverty trap. Their results show that controlling for other things, poor households that suffered shocks have experienced a further decline in their holding of productive assets since the hurricane.

If such costly bifurcation has occurred, a key challenge is to identify the asset threshold around which it takes place. To do that, consider the following general asset growth model:

$$(1) \quad \ln\left(\frac{A_{2i}}{A_{0i}}\right) = x_i\beta + A_{0i}\beta_A + \Theta_i\beta_\Theta + \varepsilon_i\beta_\varepsilon + F_i\delta_F + \omega_i,$$

where A_{0i} is the stock of productive of assets of household i prior to the hurricane, A_{2i} is the stock 30 months after the hurricane, x_i measures household lifecycle and other control variables, Θ_i measures the productive assets lost by i (expressed as a percentage of A_{0i}), ε_i measures immediate income losses cause by the hurricane (expressed again as a percentage of A_{0i}), F_i measures aid inflows (again normalized) and ω_i is an unobserved error term. Note that if $\beta_A < 0$, the growth process implied by (1) will be a convergent one.

Given the basic model (1), the key question is whether the sample is split into two regimes such that:

$$(2) \quad \ln\left(\frac{A_{2i}}{A_{0i}}\right) = \begin{cases} x_i\beta^\ell + A_{0i}\beta_A^\ell + \Theta_i\beta_\Theta^\ell + \varepsilon_i\beta_\varepsilon^\ell + F_i\delta_F^\ell + \omega_i, & q_i \leq \gamma \\ x_i\beta^u + A_{0i}\beta_A^u + \Theta_i\beta_\Theta^u + \varepsilon_i\beta_\varepsilon^u + F_i\delta_F + \omega_i, & q_i > \gamma \end{cases},$$

where q_i is the threshold variable that splits the sample into upper and lower regimes.

TABLE 1 THRESHOLD ESTIMATES OF MICAWBER THRESHOLD

	Global OLS		<i>Regime 1</i> ($A_i \leq \$720$)		<i>Regime 2</i> ($A_i > \$720$)	
<i>Initial Wealth, lnA₀</i>	-0.07345	0.014952	-0.38725	0.092783	0.001052	0.009723
<i>Asset Loss, Θ</i>	-1.77463	0.251212	-1.57135	0.319738	-1.74262	0.358254
<i>Income Loss, ε</i>	0.128547	0.069449	0.022492	0.048537	0.317148	0.155959
<i>Homeloss=1</i>	-0.14417	0.06024	-0.04662	0.176945	-0.1433	0.062469
<i>Aid Received</i>	-0.01859	0.015724	-0.06553	0.020662	0.166002	0.049437
<i>Jefe Age</i>	0.019198	0.01027	0.03247	0.026194	0.008829	0.010333
<i>Sq Jefe</i>	-0.00024	9.84E-05	-0.00033	0.000237	-0.00015	0.000101
<i>Inherited Land=1</i>	0.630911	0.307486	2.086764	0.239445	0.281313	0.263896
<i>Dept2</i>	0.068639	0.061184	0.299793	0.188195	0.024826	0.060161
<i>Dept3</i>	0.027372	0.048384	0.235576	0.246744	-0.01499	0.045715
<i>Dept10</i>	0.113444	0.08145	0.64866	0.408491	0.036957	0.058953
<i>Dept14</i>	0.109486	0.056562	0.439067	0.202396	0.031039	0.052475
<i>Constant</i>	0.488081	0.24857	1.792379	0.907719	0.089411	0.258351
<i>Observations</i>		796		103		693
<i>Degrees of Freedom</i>		783		90		680
<i>Sum of Squared Errors</i>		224.2395		66.98898		130.1046
<i>Residual Variance</i>		0.286385		0.744322		0.19133
<i>R-squared</i>		0.285245		0.426643		0.25149
<i>Heteroskedasticity Test</i> (P-Value)		5.53E-07				
			Threshold Estimate		720	
			95% Interval Estimate		720-935	

Table 1 presents estimates of (2) using the sampling splitting estimation procedure of Hansen (2000). The sample is split using A_{2i} , the monetized value of the household's assets "the day after" Hurricane Mitch. Using Hansen's procedure, the 95% interval estimate of the asset threshold is \$720-\$735. Approximately 13% of the sample observations lie below this level. Casual examination of Table 1 makes clear that the two regimes are quite distinct. Figure 1 graphs out the global OLS estimates as well as the estimates for the two regimes. All graphs hold the values of all variables at the overall sample mean values except for initial assets. As can be

seen in the figure, households that fall below the threshold are estimated to enter a process that has a low level equilibrium at around \$1000. Households above the threshold appear to be on a steady growth path.

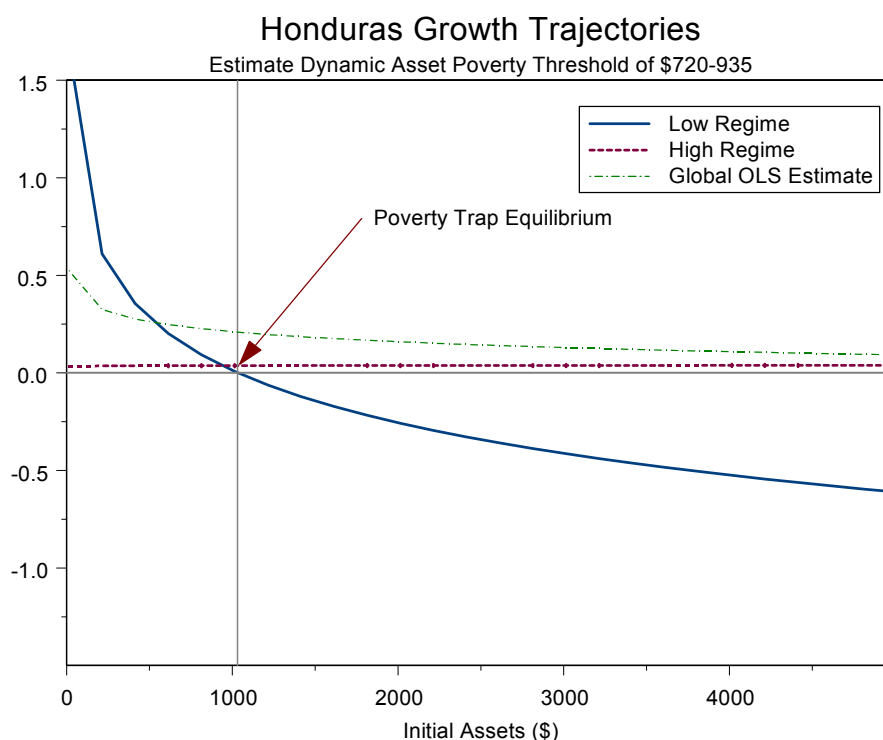


Figure 1: Bifurcated asset growth and recovery from Hurricane Mitch

Additional work needs to be done with this model. In particular, the method used does not control for household fixed effects. One might worry that those below the threshold are also those with a low intrinsic skills (or high discount rates) and who form a low convergence club. While threshold estimation with fixed effects is not yet developed, the data here in principle permit us to distinguish those who were below the threshold pre-Mitch from those who were experimentally shocked and fell below the threshold. If the latter's post-Mitch recovery path looks like that of the former group, then we would have some evidence that estimated low level equilibrium of households below the threshold reflects a true structural state dependence rather than a spurious state dependence induced by the low (on average) fixed effects of those observed

below the threshold. While further work is needed to resolve this identification problem, the econometrics of thresholds holds out the promise that we can identify dynamic asset poverty thresholds.

4.2 Eliciting Ethiopian Pastoralists' Perceptions of Thresholds

Santos and Barrett (2005) try an alternative method for identifying the dynamic asset poverty (Micawber) threshold. Working in the same villages and building directly on Lybbert et al.'s (2004a) findings of multiple dynamic wealth equilibria among Boran pastoralists in southern Ethiopia, based on nonparametric econometric analysis of 17-year herd history data, Santos and Barrett elicited respondents' subjective herd size distributions one year hence conditional on a randomly selected herd size within the different ranges defined by the dynamic equilibria estimated in Lybbert et al. (2004), as well as respondents' expectations of the climate state. They then use these data to fit growth frontiers, to derive estimates of pastoralists' self-assessment of their herding skill, and to simulate herd dynamics conditional on herder ability and historical rainfall patterns.

The results are striking. Pastoralists indeed appear to perceive the multiple dynamic equilibria reflected in herd history data. Unpacking these results, however, Santos and Barrett find that poverty traps arise almost exclusively as a function of adverse states of nature. Under favorable rainfall regimes, respondents' subjective perceptions suggest a smooth asset growth process, with nearly all herders anticipating herd growth irrespective of initial herd size, as reflected in observations – and the nonparametric kernel regression line – above the 45-degree line in Figure 2a. Multiple equilibria arise only because adverse rainfall regimes hit some herds especially hard. As shown in Figure 2b, there is considerably more cross-sectional variation in

herders' expectations about herd dynamics under adverse states of nature, as compared to favorable states. Other than for the largest herds, most herd sizes are expected to remain roughly stable, on average. But the hint of multiple dynamic equilibria arises from these bad rainfall years, further underscoring the importance of risk management mechanisms to a solid understanding of welfare dynamics.

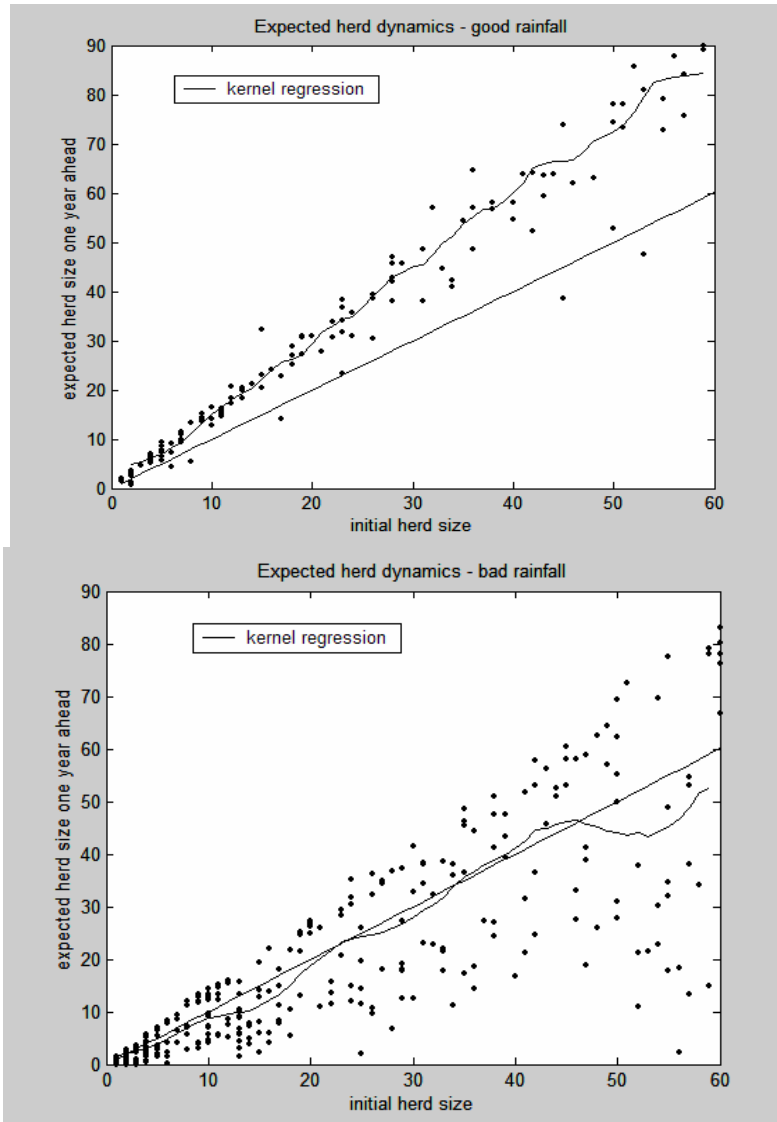


Figure 2: Expected herd dynamics in (a) good and (b) bad rainfall years

The dispersion of pastoralists' herd dynamics expectations in bad rainfall years raises anew the issue mentioned in the previous sub-section, the possibility of unobserved household-

specific effects that drive asset dynamics and performance in response to shocks. Using stochastic frontier estimation methods to estimated respondents' latent assessment of their own herding ability, Santos and Barrett find that ability plays a prominent role in wealth dynamics. The most and least able quartiles of pastoralists have distinct, unique dynamic (decadal) equilibria at high and low levels, respectively, as reflected in the dotted and dashed lines, respectively, in Figure 3. These results are consistent with the notion of conditional (or “club”) convergence. Those in the middle two quartiles of the ability distribution, however, appear to face a multiple equilibril system in which the management of shocks fundamentally affects the dynamic evolution of their herds and thus of their welfare, as reflected in the solid nonparametric kernel regression line in Figure 3. The overall pattern bears a striking resemblance to the dynamics estimated by Lybbert et al. (2004) using herd history data from other households in the same region.

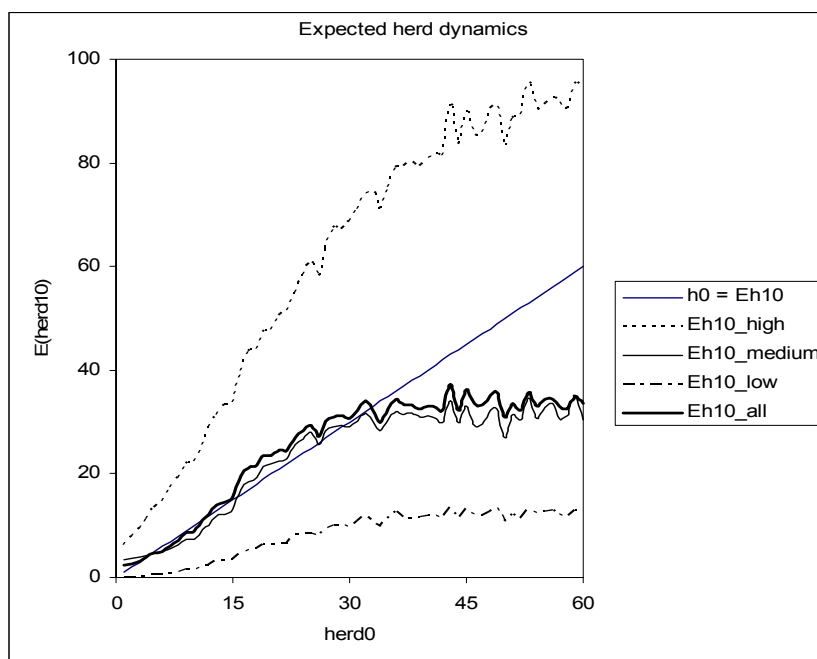


Figure 3: Ability-Dependent Herd Dynamics in Southern Ethiopia

The implication, reflected in Figure 3, is that S-shaped herd dynamics characteristic of a poverty trap pertain only to those herders of intermediate ability and arise entirely due to shocks. This clearly raises practical questions with respect to any asset redistribution policy – and the role of peer monitoring and community-based targeting – as ability is not easily monitored from the outside.

These recent empirical demonstrations are not without methodological shortcomings. They nonetheless suggest the plausibility of the idea of poverty traps and the resulting importance of understanding risk and asset management jointly to understanding long-term growth dynamics. Moreover, these examples offer the promise that in spite of the formidable methodological challenge posed by the problem of estimating unobservable dynamic asset poverty thresholds and nonlinear growth dynamics that may be state-dependent and closely associated with unobservable household attributes, the concept of a poverty trap appears empirically implementable. This raises the natural question of what such results might mean for policy as the body of empirical research in this area builds.

5. IMPLICATIONS FOR POLICY AND POLICY EXPERIMENTS

The possibility of poverty traps carries significant implications for the management of risk in the process of development and thus for government policies and donor and NGO programming. In this closing section, we briefly reflect on the policy implications of the poverty traps framework, emphasizing two core points that should help guide programming and policy experiments. First, targeting is crucial but the concept of poverty traps and critical asset thresholds suggests two different types of targeting need to be practiced, one to block pathways into poverty – especially due to shocks – and the other to help move already-poor households onto a pathway out of

poverty. Second, while shocks matter to long-run growth and poverty reduction, the type of shock – rapid or slow onset, and idiosyncratic or covariate – matters enormously to the design of effective interventions.

Targeting issues have appropriately been a longstanding focus of attention in poverty reduction policy (Besley and Kanbur 1988). Targeting has typically aimed at identifying the poorest members of a population for income support and related interventions. This is highly desirable from the perspective of helping move those who might currently be in a low-level equilibrium towards or beyond the dynamic asset poverty threshold. The optimal form of transfer will depend on the cost-effectiveness of alternative interventions in stimulating self-reinforcing asset accumulation and productivity growth among recipients (e.g., cash versus food versus free schooling for children versus land, etc.).

The poverty traps perspective carries another implication for targeting, however. Because adverse shocks can knock people beneath a critical threshold, thereby having permanent consequences for growth, there needs to be complementary targeting of assets at or around a common threshold level to provide an effective safety net so that those non-poor who suffer shocks are able to recover rather than joining the ranks of the persistently poor. Because the natural dynamics of asset accumulation turn negative just beneath the threshold, short-term interventions to keep people from falling beyond the threshold and into a poverty trap are highly likely far less expensive to society than ex post efforts at lifting them back to the threshold level. This sort of safety net targeting necessarily does *not* target the poorest, however. Rather, it targets the critical thresholds for the assets that appear most important to maintaining the capacity to recover naturally. It therefore targets particular assets vulnerable to particular sorts of shocks. Examples include early childhood immunization and nutritional supplementation

programs to maintain children's health so as to keep their physical and cognitive development on track during the crucial first 36 months of life, conditional cash transfer programs – such as Mexico's Progresa program – to keep children in school in the wake of shocks (e.g., illness or unemployment of the household primary earner) that might otherwise force their withdrawal, and livestock restocking programs that restore pastoralists' viability in transhumant systems. These “productive safety nets” are meant to restore productivity quickly. This distinguishes them from conventional safety nets-cum-transfer-programs that typically aim to assist the poorest. The two are obviously complements. But the former involves triage, focusing on the threshold and not on those well below it. In the language of the popular children's game, productive safety nets block the chutes while conventional transfer programs provide ladders.

The second crucial implication of the poverty traps perspective on risk and growth is the need to design different policies to address different sorts of shocks. There exist two key dimensions along which one can usefully distinguish shocks. The first is the relatively familiar covariate-idiosyncratic distinction, relating to how widespread a shock is felt within a community. The second relates to how easily a shock can be anticipated and mitigated, ranging from slow onset shocks – commonly associated with droughts or progressive illnesses such as HIV/AIDS – to rapid onset shocks associated with earthquakes, tsunamis, typhoons, accidents and sudden illnesses such as malaria.

In places prone to rapid onset shocks, preventive actions –e.g., emergency warning systems, reinforced construction, prophylaxis against disease, etc. – become especially valuable because ex ante response capacity is negligible. For similar reasons, ready-to-expand interventions already in place – such as publicly funded curative health care for deadly infectious diseases or employment guarantee schemes to absorb labor suddenly displaced from traditional

livelihoods by a hurricane or tsunami – also play a key role as there is typically little time to design and implement productive safety nets in the wake of rapid onset emergencies.

Slow onset shocks afford more time for adaptive response. With adequate early warning, policymakers and NGOs can design and implement schemes such as livestock offtake programs in response to emergent drought, food aid and food for work schemes to tide people over to the next harvest without having to liquidate key assets, and survivor skills training and home health care programs for the families of HIV-positive individuals.

The covariate-idiosyncratic shock distinction matters to the scale of response and the levels at which targeting needs to take place. The empirical literature increasingly finds much or most income and asset risk is idiosyncratic, i.e., specific to households and individuals rather than experienced universally (Hoddinott forthcoming, Lybbert et al. 2004, Deaton 1997). Idiosyncratic shocks can, in principle, be managed within communities using informal transfers and financial systems. But policymakers need to pay careful attention to the possibility of social exclusionary processes that might leave dangerous holes in the social safety net (Santos and Barrett 2005). While one needs to heed appropriate cautions that public transfers not simply displace private ones (Cox and Jimenez 1995, Cox et al. 2004), it is equally important not to presume that the social safety net covers everyone's idiosyncratic risk nor that such crowding out necessarily occurs (Lentz and Barrett 2004). Public employment guarantee schemes and conditional cash transfers can, again, provide a valuable supplement to social safety nets.

The real key to idiosyncratic risk management, however, is access to financial services. The very existence of a dynamic asset poverty threshold depends critically on the degree to which the household is excluded from intertemporal exchange through credit, insurance or savings, whether formally or through social networks. A household with perfect access to capital

over time and across states of nature would never face a critical threshold. Such a household would always be able to access the funds needed to build assets so as to move onto a natural growth trajectory or to replace assets so as to recover quickly and fully from a shock.

Microfinance programs that effectively plug the gaps in access to credit, insurance and savings products can help enormously in reducing vulnerability to idiosyncratic shocks knocking households into chronic poverty.

Covariate shocks almost by definition require an inflow of resources from outside the affected population. One problem commonly faced in covariate shocks, however, is that outsiders commonly do not address emerging covariate shocks with adequate resources until the situation has turned grave, at which point much of the affected population has already passed the relevant threshold.⁶ For slow onset covariate shocks, commercially viable insurance products may prove useful. Exogenous events – e.g., rainfall or combat deaths over a given period – could serve as triggers for claims payments to NGOs or multilateral agencies prepared to make steady premia payments in exchange for prompt payouts as soon as an emerging disaster becomes evident, thereby buying them time to respond appropriately before the situation has deteriorated to the point that many targeted beneficiaries have collapsed beneath the Micawber Threshold. Rapid onset covariate shocks demanding strong international response pose the greatest challenge.

It can be difficult to predict where shocks will hit and therefore to design effective policy experiments related to risk interventions and it would be ethically problematic to randomize protection against anticipated shocks. But one can nonetheless use policy experiments to measure induced behavioral responses in the absence of a shock rather than the direct effects of

⁶ Cite WHO/UNHCR data on proportion and delay of response to consolidate emergency appeals in DR Congo, Darfur, Eritrea, Ethiopia, southern Africa.

safety net interventions in the event of a shock. One prediction that emerges from the poverty traps perspective is that in the presence of a credible productive safety net, middle class agents' behavior should exhibit less risk aversion. They should be prepared to take a few more chances on higher return – higher risk technologies, markets, etc. One could test this hypothesis directly through randomized introduction of credible productive safety nets, checking whether people subsequently adopt strategies associated with more rapid expected asset accumulation and where on the wealth distribution these effects are most pronounced, as well as whether the safety net “overcorrects” in the sense of inducing a moral hazard problem that outweighs the social gains associated with the safety net.

The possibility that poverty traps exist – as a growing body of micro-level empirical evidence increasingly suggests – carries significant implications for how individuals and households manage assets and risk. This therefore also has significant implications for growth and social protection policies, in particular for the inherent inextricability of the two. In this paper we have reviewed some of these mechanisms and their implications. But we still know relatively little about how best to identify either dynamic asset poverty thresholds or the most cost-effective means of defending those thresholds in the face of different sorts of shocks. The policy-relevant research agenda remains considerable.

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